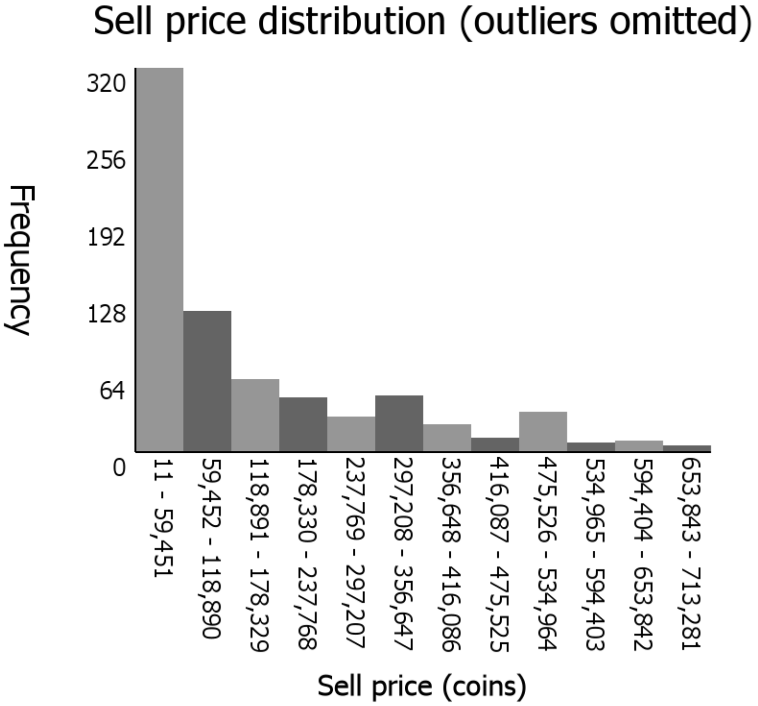
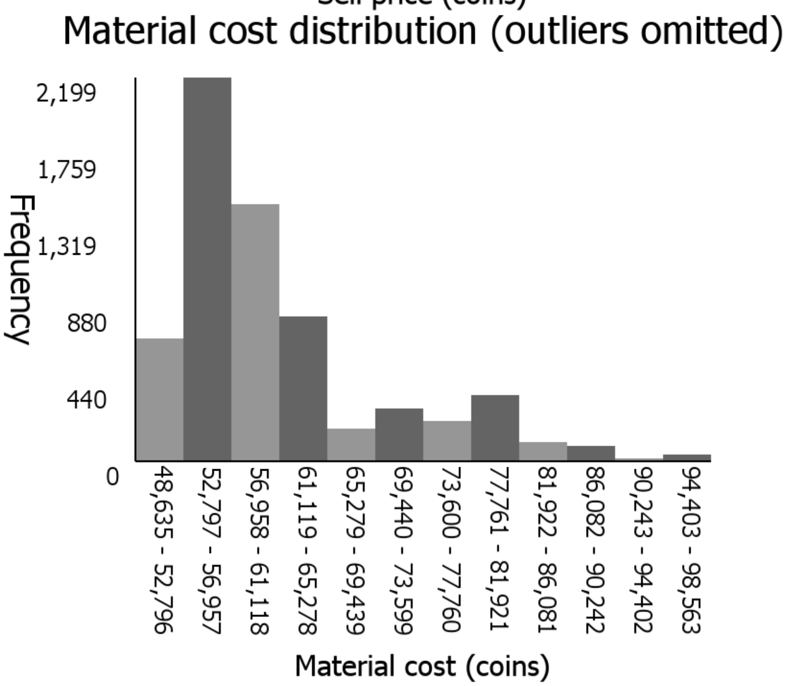
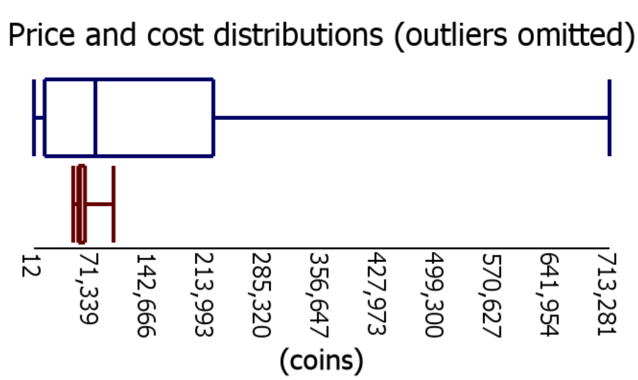
Selling prices and material costs of a fire talisman

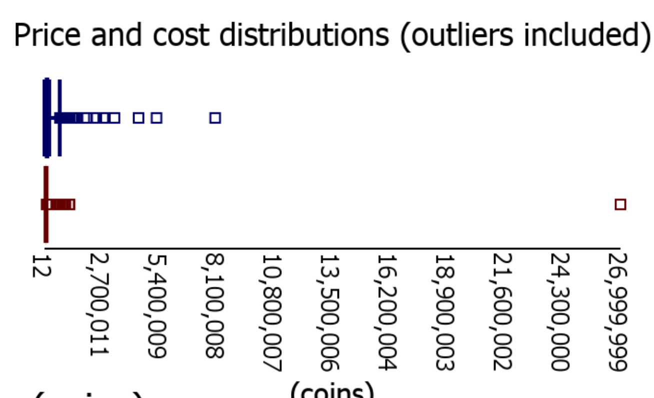


The distribution is centered around 76,148 coins (median). It has a moderate variability (IQR of 209,056 coins) and is skewed right. There are no large gaps in the distribution. There are 0 outliers on the low end and 80 outliers on the high end, the highest being 8,000,000 coins.



The distribution is centered around 57,111 coins (median). It has a low variability (IQR of 8,315 coins) and is skewed right. There are no large gaps in the distribution. There are 0 outliers on the low end and 924 outliers on the high end, the highest being 26,999,999 coins.





Key:

Sell Price

Material Cost

5 number summeries (coins):

min: 12, q1: 13,225, median: 76,148, q3: 222,281, max: 713,281

min: 48,636, q1: 54,957, median: 57,111, q3: 63,272, max: 98,563

Statistical test comparing the selling prices and material costs of a fire talisman

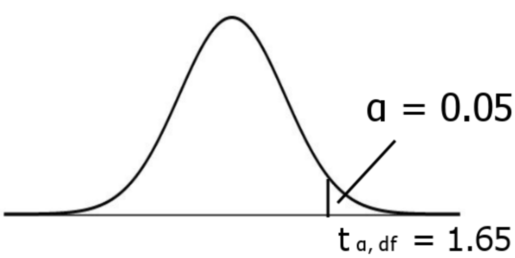
Let group1 = Sell prices of a fire talisman, group2 = Material cost of a fire talisman
X_1 = Sell price of a fire talisman (coins), X_2 = Material cost of a fire talisman (coins)
μ_1 = Mean sell price of a fire talisman (coins), μ_2 = Mean material cost of a fire talisman (coins)

H_o: $\mu_1 = \mu_2$ H_a: $\mu_1 > \mu_2$

Requirements for a difference of means test (σ_1 and σ_2 unknown):

1. 2 independent SRS's: ✓ $n_1 = 715$ $n_2 = 6564$
   One price/cost from either group will not affect any price/cost from either group
2. σ is not known, but S_x is: ✓ $S_1 = 166{,}791.1859$ coins $S_2 = 9{,}459.5209$ coins
3. $n_1 > 30$ and $n_2 > 30$: ✓ $n_1 = 715 > 30$ $n_2 = 6564 > 30$

Rejection Critieria:
$\alpha = 0.05$ df = 714



Reject H_o if $t > 1.65$

Test Statistic:

$$t = \frac{(\bar{x}_1 - \bar{x}_2) - (\mu_1 - \mu_2)}{\sqrt{\frac{S_1^2}{N_1} + \frac{S_2^2}{N_2}}}$$

$t = 13.66$
p-value < 0.0001

Reject H_o since $13.66 > 1.65$

Inputs:
$\bar{x}_1 = 146{,}053.1469$ (coins)
$\bar{x}_2 = 60{,}819.6917$ (coins)
$S_1 = 166{,}791.1859$ (coins)
$S_2 = 9{,}459.5209$ (coins)
$n_1 = 715$
$n_2 = 6{,}564$

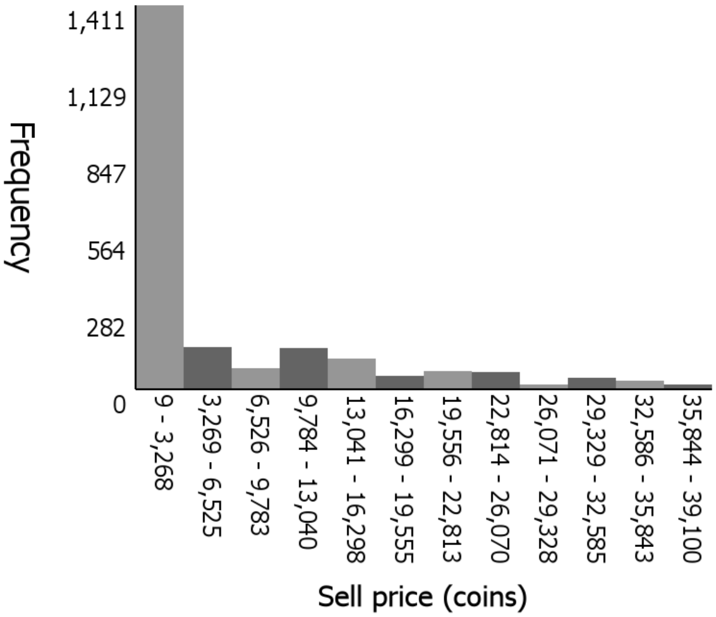
There is significant evidence at the α=0.05 level of significance to support the claim that the mean selling price of a fire talisman is greater than the mean cost of the materials required to make it.

Since we rejected H_o, it suggests that on average people earned more coins from selling this item than it would have cost them to buy the materials.

Implication: the test suggests that on average we could make a profit from flipping this item.

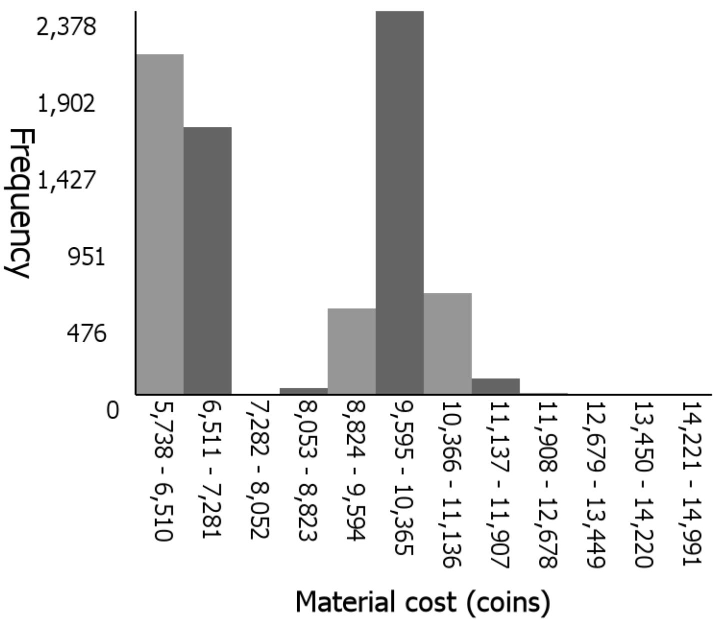
Selling prices and material costs of a jungle axe

Sell price distribution (outliers omitted)



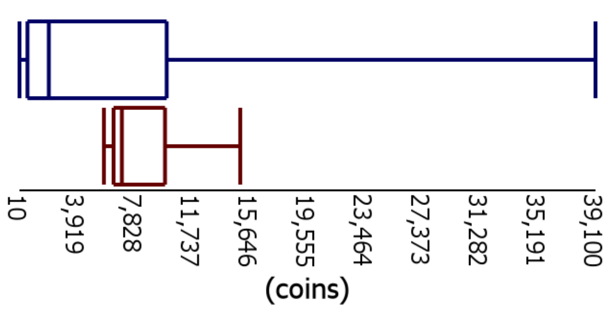
The distribution is centered around 2,000 coins (median). It has a high variability (IQR of 9,448 coins) and is skewed right. There are no large gaps in the distribution. There are 0 outliers on the low end and 333 outliers on the high end, the highest being 150,000,000 coins.

Material cost distribution (outliers omitted)

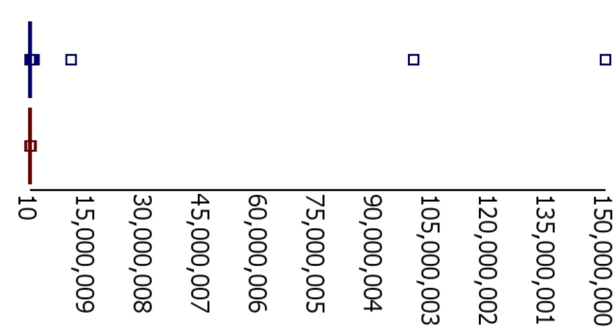


The distribution is centered around 6,957 coins (median). It has a low variability (IQR of 3,492 coins) and is skewed right. There are large gaps between 7,281 - 8,052 coins and 12,678 - 14,220 coins. There are 0 outliers on the low end and 16 outliers on the high end, the highest being 293,255 coins.

Price and cost distributions (outliers omitted)



Price and cost distributions (outliers included)



Key:

Sell Price

Material Cost

5 number summeries (coins):

min: 10, q1: 552, median: 2,000, q3: 10,000, max: 39,100

min: 5,739, q1: 6,395, median: 6,957, q3: 9,886, max: 14,991

Statistical test comparing the selling prices and material costs of a jungle axe

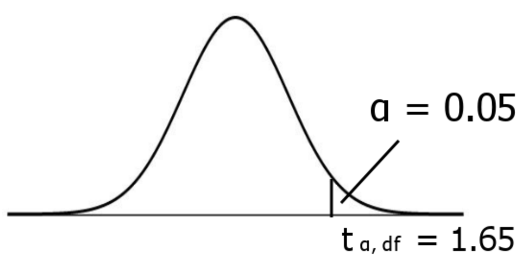
Let group1 = Sell prices of a jungle axe, group2 = Material cost of a jungle axe
X_1 = Sell price of a jungle axe (coins), X_2 = Material cost of a jungle axe (coins)
μ_1 = Mean sell price of a jungle axe (coins), μ_2 = Mean material cost of a jungle axe (coins)

H_o: $\mu_1 = \mu_2$ H_a: $\mu_1 > \mu_2$

Requirements for a difference of means test (σ_1 and σ_2 unknown):

1. 2 independent SRS's: ✓ $n_1 = 2200$ $n_2 = 7472$
   One price/cost from either group will not affect any price/cost from either group
2. σ is not known, but S_x is: ✓ S_1 = 8,653.3289 coins S_2 = 1,831.1261 coins
3. $n_1 > 30$ and $n_2 > 30$: ✓ $n_1 = 2200 > 30$ $n_2 = 7472 > 30$

Rejection Critieria:
$\alpha = 0.05$ df = 2199



Reject H_o if $t > 1.65$

Test Statistic:

$$t = \frac{(\bar{x}_1 - \bar{x}_2) - (\mu_1 - \mu_2)}{\sqrt{\frac{S_1^2}{N_1} + \frac{S_2^2}{N_2}}}$$

Inputs:
$\bar{x}_1$ = 6,116.0823 (coins)
$\bar{x}_2$ = 8,157.1758 (coins)
S_1 = 8,653.3289 (coins)
S_2 = 1,831.1261 (coins)
n_1 = 2,200
n_2 = 7,472

$t = -10.99$
p-value > 0.9999

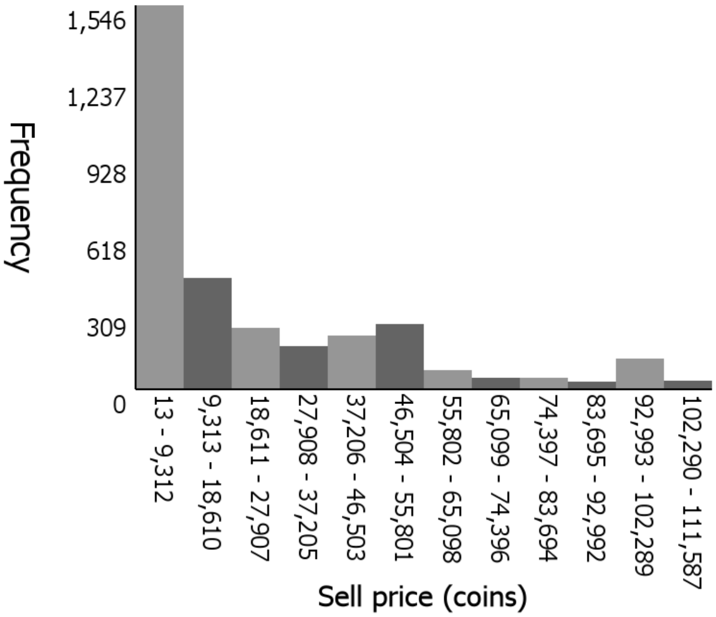
Fail to reject H_o since $-10.99 < 1.65$

There is not significant evidence at the α=0.05 level of significance to support the claim that the mean selling price of a jungle axe is greater than the mean cost of the materials required to make it.

Since we failed to reject H_o, it suggests that on average people did not earn more coins from selling this item than it would have cost them to buy the materials.

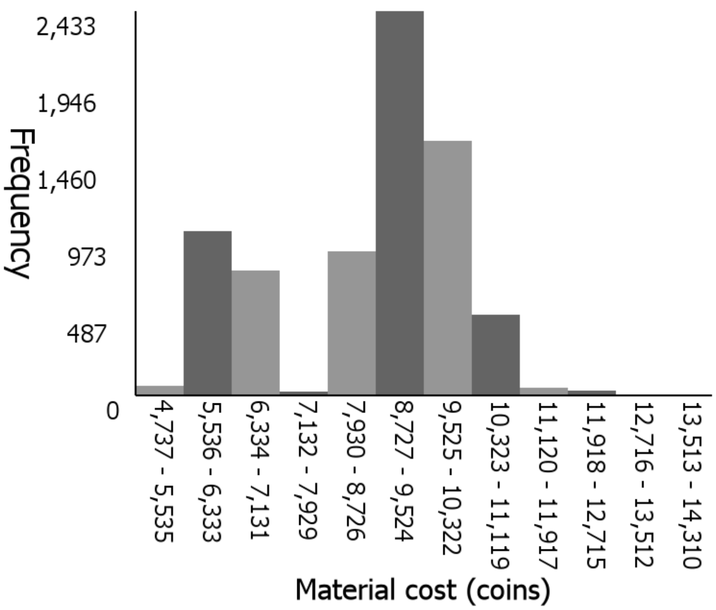
Selling prices and material costs of a grappling hook

Sell price distribution (outliers omitted)



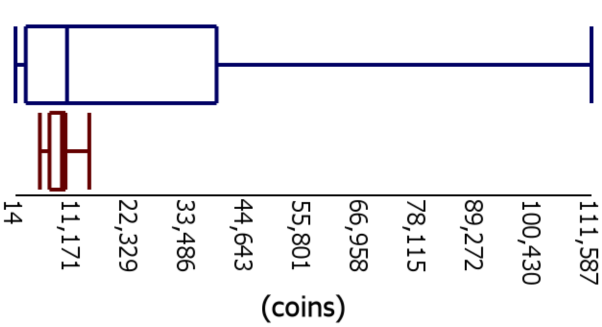
The distribution is centered around 10,000 coins (median). It has a high variability (IQR of 36,964 coins) and is skewed right. There are no large gaps in the distribution. There are 0 outliers on the low end and 236 outliers on the high end, the highest being 286,000,000 coins.

Material cost distribution (outliers omitted)

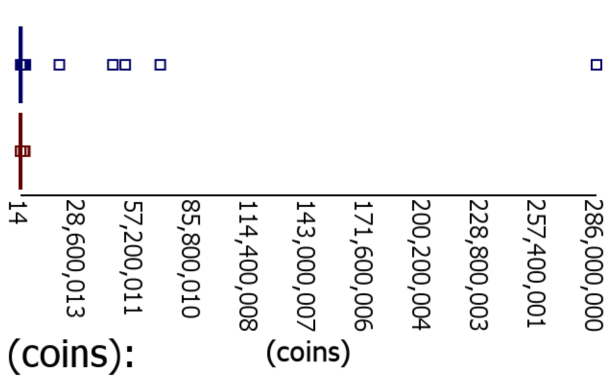


The distribution is centered around 9,012 coins (median). It has a low variability (IQR of 3,105 coins) and is skewed left. There are no large gaps in the distribution. There are 0 outliers on the low end and 5 outliers on the high end, the highest being 2,138,433 coins.

Price and cost distributions (outliers omitted)



Price and cost distributions (outliers included)



Key:

Sell Price

Material Cost

5 number summeries (coins):

min: 14, q1: 2,000, median: 10,000, q3: 38,964, max: 111,587

min: 4,738, q1: 6,600, median: 9,012, q3: 9,705, max: 14,310

Statistical test comparing the selling prices and material costs of a grappling hook

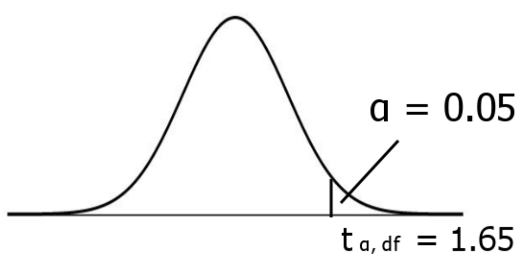
Let group1 = Sell prices of a grappling hook, group2 = Material cost of a grappling hook
X_1 = Sell price of a grappling hook (coins), X_2 = Material cost of a grappling hook (coins)
μ_1 = Mean sell price of a grappling hook (coins), μ_2 = Mean material cost of a grappling hook (coins)

H_o: $\mu_1 = \mu_2$ H_a: $\mu_1 > \mu_2$

Requirements for a difference of means test (σ_1 and σ_2 unknown):

1. 2 independent SRS's: ✓ $n_1 = 3249$ $n_2 = 7483$
   One price/cost from either group will not affect any price/cost from either group
2. σ is not known, but S_x is: ✓ S_1 = 27,242.0468 coins S_2 = 1,598.5466 coins
3. $n_1 > 30$ and $n_2 > 30$: ✓ $n_1 = 3249 > 30$ $n_2 = 7483 > 30$

Rejection Critieria:
$\alpha = 0.05$ df = 3248



Reject H_o if $t > 1.65$

Test Statistic:

$$t = \frac{(\bar{x}_1 - \bar{x}_2) - (\mu_1 - \mu_2)}{\sqrt{\frac{S_1^2}{N_1} + \frac{S_2^2}{N_2}}}$$

$t = 29.59$
p-value < 0.0001

Reject H_o since $29.59 > 1.65$

Inputs:
$\bar{x}_1$ = 22,705.5466 (coins)
$\bar{x}_2$ = 8,552.4529 (coins)
S_1 = 27,242.0468 (coins)
S_2 = 1,598.5466 (coins)
n_1 = 3,249
n_2 = 7,483

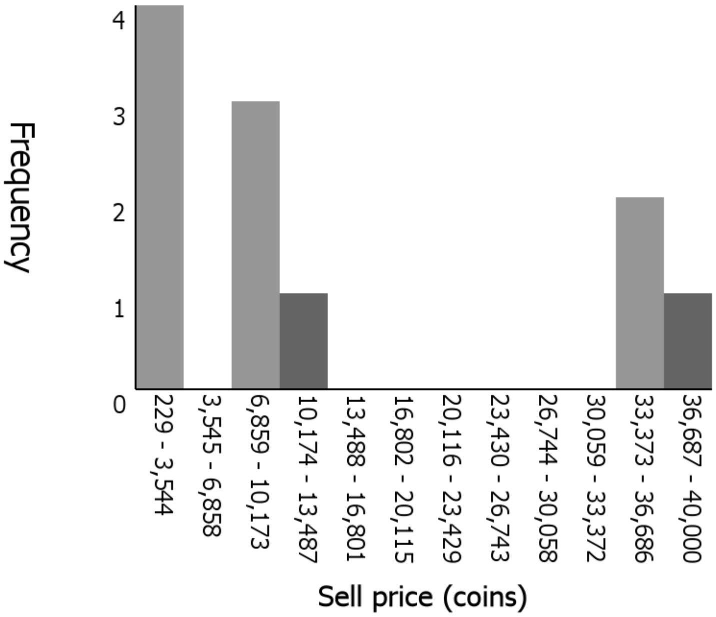
There is significant evidence at the α=0.05 level of significance to support the claim that the mean selling price of a grappling hook is greater than the mean cost of the materials required to make it.

Since we rejected H_o, it suggests that on average people earned more coins from selling this item than it would have cost them to buy the materials.

Implication: the test suggests that on average we could make a profit from flipping this item.

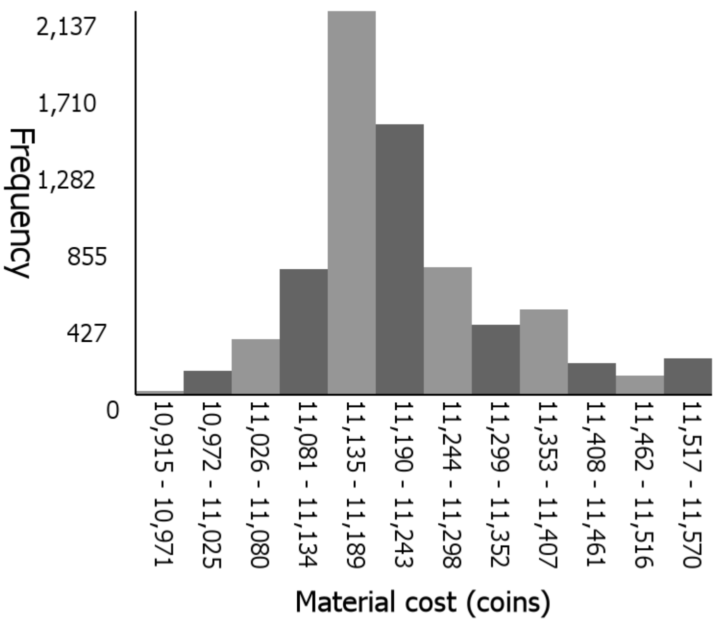
Selling prices and material costs of a salmon chestplate

Sell price distribution (outliers omitted)



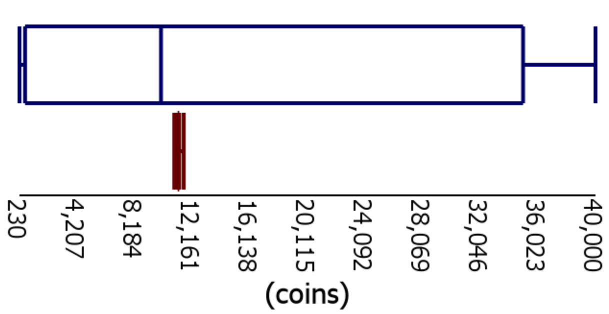
The distribution is centered around 10,000 coins (median). It has a high variability (IQR of 34,385 coins) and is skewed right. There are large gaps between 3,544 - 6,858 coins and 13,487 - 33,372 coins. There are 0 outliers on the low end and 0 outliers on the high end.

Material cost distribution (outliers omitted)

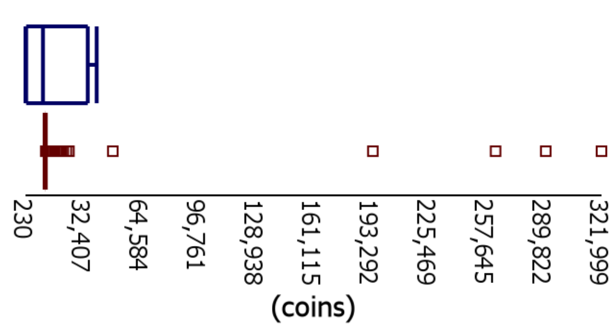


The distribution is centered around 11,193 coins (median). It has a low variability (IQR of 111 coins) and is mostly symmetrical. There are no large gaps in the distribution. There are 0 outliers on the low end and 618 outliers on the high end, the highest being 321,999 coins.

Price and cost distributions (outliers omitted)



Price and cost distributions (outliers included)



Key:

Sell Price

Material Cost

5 number summeries (coins):

min: 230, q1: 615, median: 10,000, q3: 35,000, max: 40,000

min: 10,916, q1: 11,149, median: 11,193, q3: 11,260, max: 11,570

Statistical test comparing the selling prices and material costs of a <u>salmon chestplate</u>

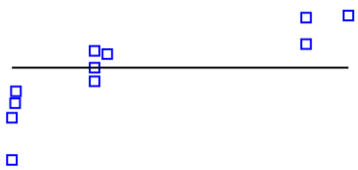
Let group1 = Sell prices of a salmon chestplate, group2 = Material cost of a salmon chestplate
X_1 = Sell price of a salmon chestplate (coins), X_2 = Material cost of a salmon chestplate (coins)
μ_1 = Mean sell price of a salmon chestplate (coins), μ_2 = Mean material cost of a salmon chestplate (coins)

H_o: $\mu_1 = \mu_2$ H_a: $\mu_1 > \mu_2$

<u>Requirements for a difference of means test (σ_1 and σ_2 unknown):</u>

1. 2 independent SRS's: ✓ $n_1 = 11$ $n_2 = 6870$
   One price/cost from either group will not affect any price/cost from either group
2. σ is not known, but S_x is: ✓ S_1 = 15,320.8714 coins S_2 = 112.0512 coins
3. Group1 is normally distributed and $n_2 > 30$: ✓

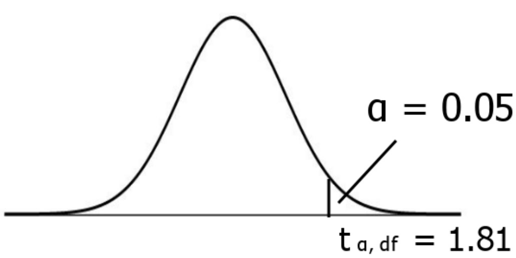
Quantile plot of sell prices



$n_2 = 6870 > 30$

<u>Rejection Critieria:</u>

$\alpha = 0.05$ df = 10



Reject H_o if $t > 1.81$

<u>Test Statistic:</u>

$$t = \frac{(\bar{x}_1 - \bar{x}_2) - (\mu_1 - \mu_2)}{\sqrt{\frac{S_1^2}{N_1} + \frac{S_2^2}{N_2}}}$$

$t = 0.59$
p-value = 0.2847

Fail to reject H_o since $0.59 < 1.81$

Inputs:

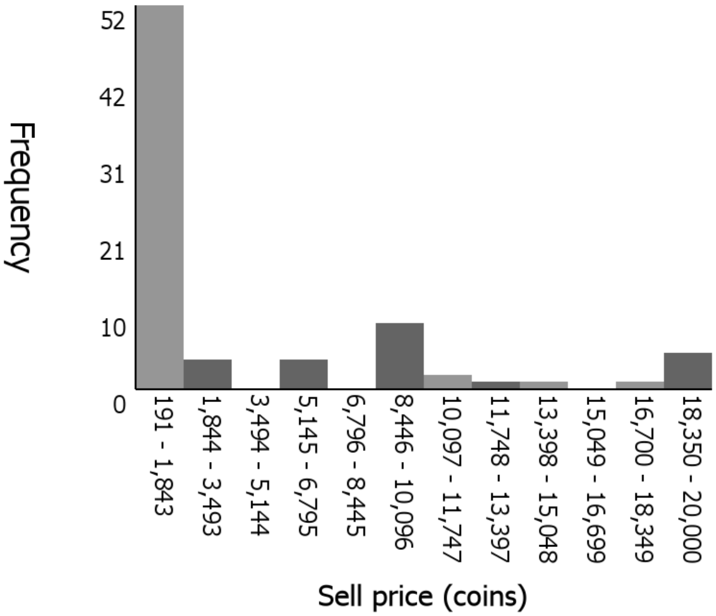
$\bar{x}_1$ = 13,934.7273 (coins)
$\bar{x}_2$ = 11,217.4811 (coins)
S_1 = 15,320.8714 (coins)
S_2 = 112.0512 (coins)
n_1 = 11
n_2 = 6,870

There is not significant evidence at the α=0.05 level of significance to support the claim that the mean selling price of a salmon chestplate is greater than the mean cost of the materials required to make it.

Since we failed to reject H_o, it suggests that on average people did not earn more coins from selling this item than it would have cost them to buy the materials.

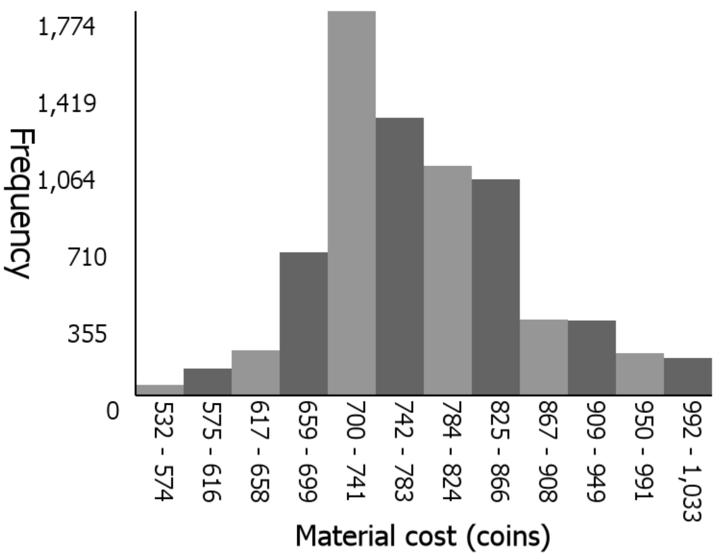
Selling prices and material costs of a potion affinity talisman

Sell price distribution (outliers omitted)



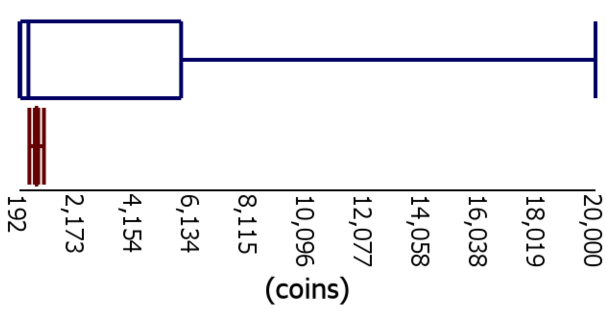
The distribution is centered around 500 coins (median). It has a high variability (IQR of 5,529 coins) and is skewed right. There are large gaps between 3,493 - 5,144 coins, 6,795 - 8,445 coins, and 15,048 - 16,699 coins. There are 0 outliers on the low end and 11 outliers on the high end, the highest being 408,680 coins.

Material cost distribution (outliers omitted)

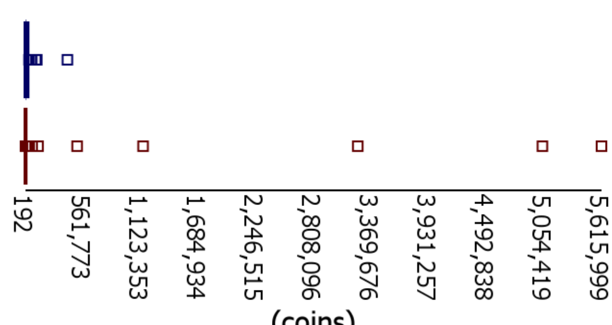


The distribution is centered around 763 coins (median). It has a low variability (IQR of 117 coins) and is mostly symmetrical. There are no large gaps in the distribution. There are 53 outliers on the low end, the lowest being 403 coins and 214 outliers on the high end, the highest being 5,615,999 coins.

Price and cost distributions (outliers omitted)



Price and cost distributions (outliers included)



Key:

- Sell Price
- Material Cost

5 number summeries (coins):

min: 192, q1: 221, median: 500, q3: 5,750, max: 20,000

min: 533, q1: 719, median: 763, q3: 836, max: 1,033

Statistical test comparing the selling prices and material costs of a <u>potion affinity talisman</u>

Let group1 = Sell prices of a potion affinity talisman, group2 = Material cost of a potion affinity talisman

X_1 = Sell price of a potion affinity talisman (coins), X_2 = Material cost of a potion affinity talisman (coins)

μ_1 = Mean sell price of a potion affinity talisman (coins),

μ_2 = Mean material cost of a potion affinity talisman (coins)

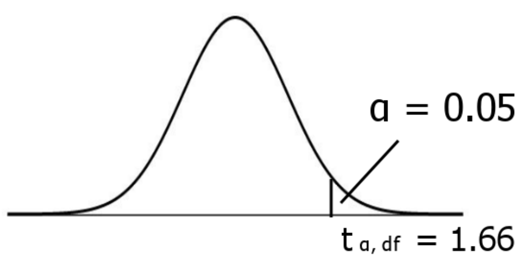
H_o: $\mu_1 = \mu_2$ H_a: $\mu_1 > \mu_2$

<u>Requirements for a difference of means test (σ_1 and σ_2 unknown):</u>

1. 2 independent SRS's: ✓ $n_1 = 79$ $n_2 = 7221$
   One price/cost from either group will not affect any price/cost from either group
2. σ is not known, but S_x is: ✓ S_1 = 5,948.0045 coins S_2 = 88.2624 coins
3. $n_1 > 30$ and $n_2 > 30$: ✓ $n_1 = 79 > 30$ $n_2 = 7221 > 30$

<u>Rejection Critieria:</u>

$\alpha = 0.05$ df = 78



Reject H_o if $t > 1.66$

<u>Test Statistic:</u>

$$t = \frac{(\bar{x}_1 - \bar{x}_2) - (\mu_1 - \mu_2)}{\sqrt{\frac{S_1^2}{N_1} + \frac{S_2^2}{N_2}}}$$

$t = 4.65$

p-value < 0.0001

Reject H_o since $4.65 > 1.66$

Inputs:

$\bar{x}_1$ = 3,894.1013 (coins)

$\bar{x}_2$ = 779.2289 (coins)

S_1 = 5,948.0045 (coins)

S_2 = 88.2624 (coins)

n_1 = 79

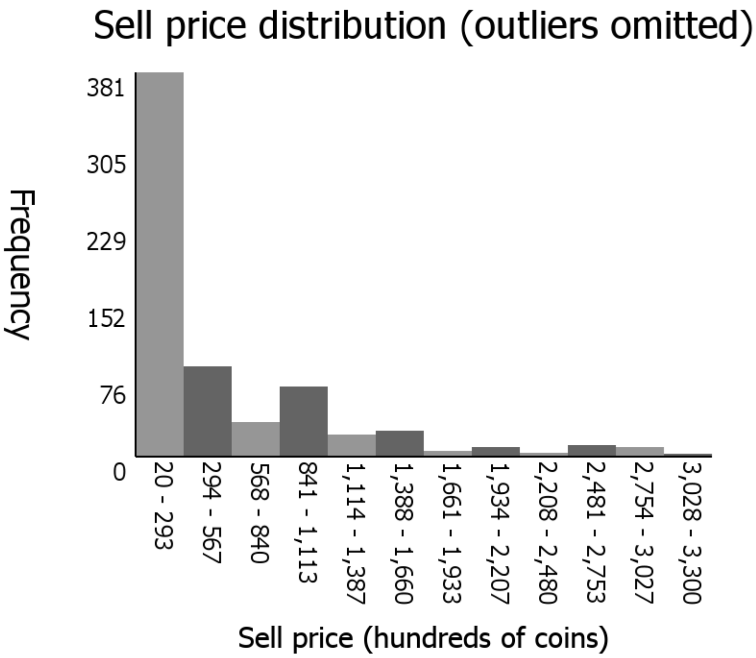
n_2 = 7,221

There is significant evidence at the α=0.05 level of significance to support the claim that the mean selling price of a potion affinity talisman is greater than the mean cost of the materials required to make it.

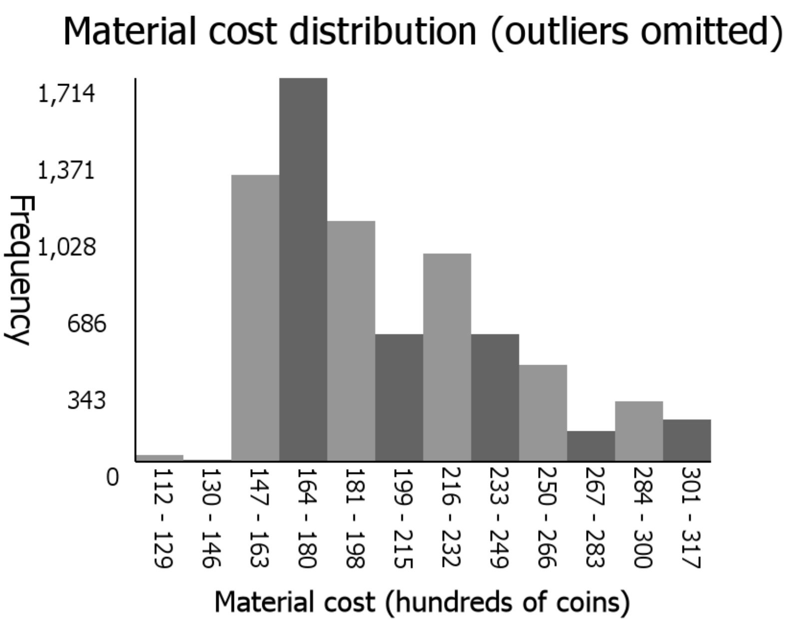
Since we rejected H_o, it suggests that on average people earned more coins from selling this item than it would have cost them to buy the materials.

Implication: the test suggests that on average we could make a profit from flipping this item.

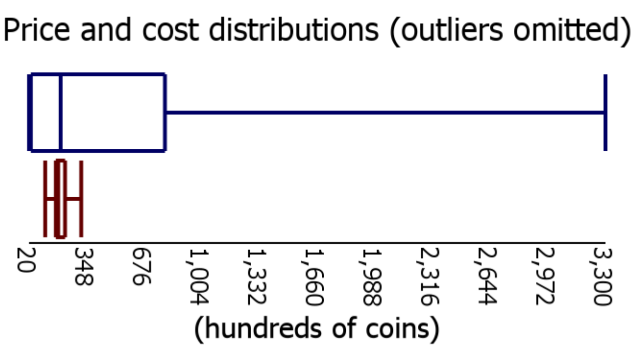
Selling prices and material costs of a silver fang

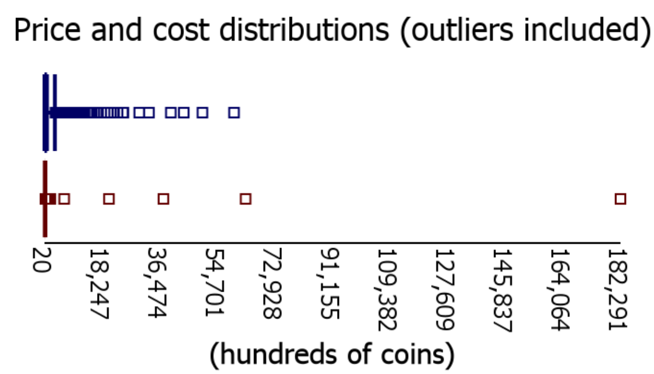


The distribution is centered around 20,000 coins (median). It has a high variability (IQR of 76,308 coins) and is skewed right. There are no large gaps in the distribution. There are 0 outliers on the low end and 131 outliers on the high end, the highest being 6,000,000 coins.



The distribution is centered around 18,603 coins (median). It has a low variability (IQR of 5,257 coins) and is skewed right. There are no large gaps in the distribution. There are 0 outliers on the low end and 282 outliers on the high end, the highest being 18,229,065 coins.





Key:

Sell Price

Material Cost

5 number summeries (hundreds of coins):

min: 20, q1: 30, median: 200, q3: 794, max: 3,300

min: 112, q1: 172, median: 186, q3: 225, max: 317

Statistical test comparing the selling prices and material costs of a <u>silver fang</u>

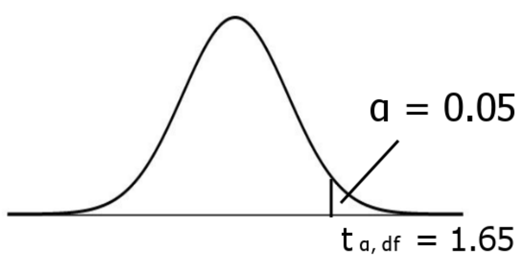
Let group1 = Sell prices of a silver fang, group2 = Material cost of a silver fang
X_1 = Sell price of a silver fang (coins), X_2 = Material cost of a silver fang (coins)
μ_1 = Mean sell price of a silver fang (coins), μ_2 = Mean material cost of a silver fang (coins)

$H_o: \mu_1 = \mu_2 \quad H_a: \mu_1 > \mu_2$

<u>Requirements for a difference of means test (σ_1 and σ_2 unknown):</u>

1. 2 independent SRS's: ✓ $n_1 = 667$ $n_2 = 7206$
   One price/cost from either group will not affect any price/cost from either group
2. σ is not known, but S_x is: ✓ $S_1 = 68{,}217.5679$ coins $S_2 = 4{,}132.1312$ coins
3. $n_1 > 30$ and $n_2 > 30$: ✓ $n_1 = 667 > 30$ $n_2 = 7206 > 30$

<u>Rejection Critieria:</u>
$\alpha = 0.05$ df = 666



Reject H_o if $t > 1.65$

<u>Test Statistic:</u>

$$t = \frac{(\bar{x}_1 - \bar{x}_2) - (\mu_1 - \mu_2)}{\sqrt{\frac{S_1^2}{N_1} + \frac{S_2^2}{N_2}}}$$

$t = 11.71$
p-value < 0.0001

Reject H_o since $11.71 > 1.65$

Inputs:
$\bar{x}_1 = 51{,}061.7391$ (coins)
$\bar{x}_2 = 20{,}123.3159$ (coins)
$S_1 = 68{,}217.5679$ (coins)
$S_2 = 4{,}132.1312$ (coins)
$n_1 = 667$
$n_2 = 7{,}206$

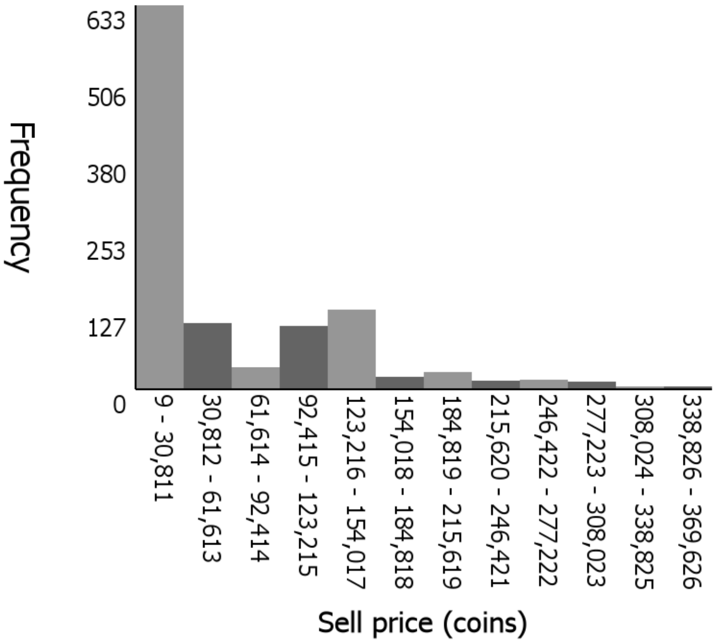
There is significant evidence at the α=0.05 level of significance to support the claim that the mean selling price of a silver fang is greater than the mean cost of the materials required to make it.

Since we rejected H_o, it suggests that on average people earned more coins from selling this item than it would have cost them to buy the materials.

Implication: the test suggests that on average we could make a profit from flipping this item.

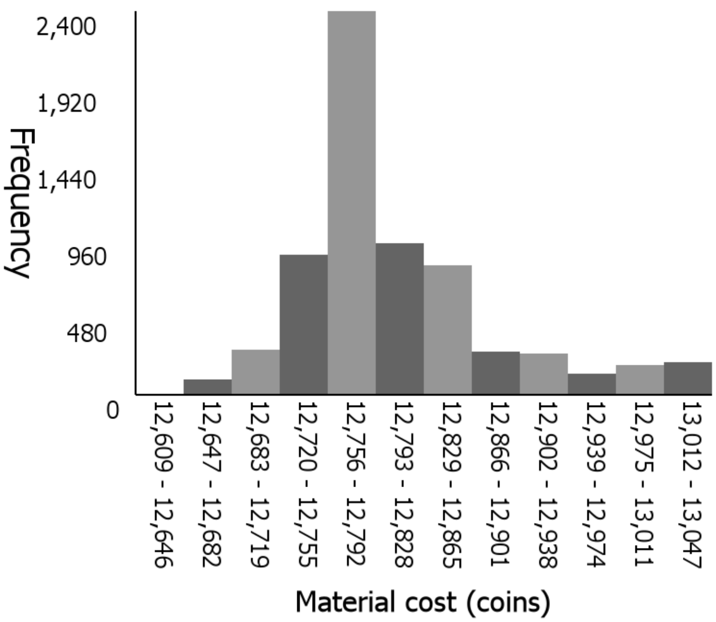
Selling prices and material costs of a night vision charm

Sell price distribution (outliers omitted)



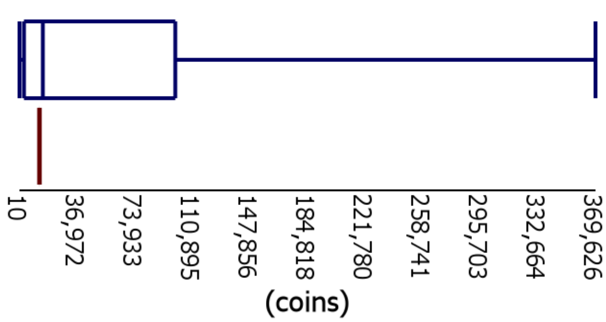
The distribution is centered around 15,000 coins (median). It has a high variability (IQR of 97,125 coins) and is skewed right. There are no large gaps in the distribution. There are 0 outliers on the low end and 114 outliers on the high end, the highest being 10,500,000 coins.

Material cost distribution (outliers omitted)

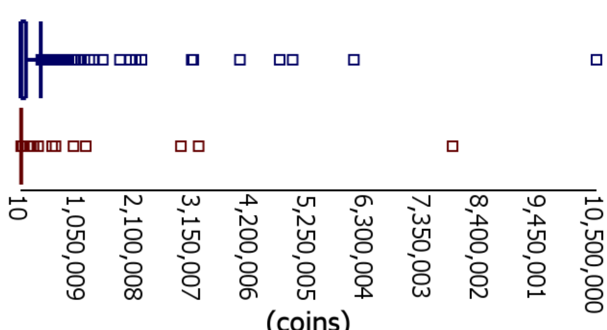


The distribution is centered around 12,787 coins (median). It has a low variability (IQR of 71 coins) and is mostly symmetrical. There are no large gaps in the distribution. There are 12 outliers on the low end, the lowest being 12,558 coins and 1001 outliers on the high end, the highest being 7,876,747 coins.

Price and cost distributions (outliers omitted)



Price and cost distributions (outliers included)



Key:

Sell Price

Material Cost

5 number summeries (coins):

min: 10, q1: 2,875, median: 15,000, q3: 100,000, max: 369,626

min: 12,610, q1: 12,766, median: 12,787, q3: 12,837, max: 13,047

Statistical test comparing the selling prices and material costs of a night vision charm

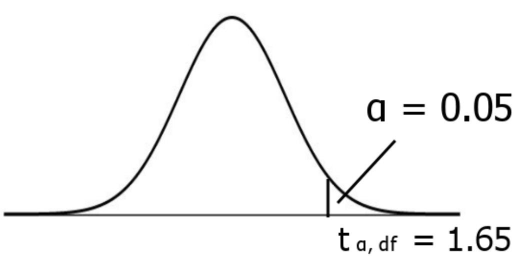
Let group1 = Sell prices of a night vision charm, group2 = Material cost of a night vision charm
X_1 = Sell price of a night vision charm (coins), X_2 = Material cost of a night vision charm (coins)
μ_1 = Mean sell price of a night vision charm (coins), μ_2 = Mean material cost of a night vision charm (coins)

$H_o: \mu_1 = \mu_2$ $H_a: \mu_1 > \mu_2$

Requirements for a difference of means test (σ_1 and σ_2 unknown):

1. 2 independent SRS's: ✓ $n_1 = 1115$ $n_2 = 6475$
   One price/cost from either group will not affect any price/cost from either group
2. σ is not known, but S_x is: ✓ $S_1 = 76{,}155.5146$ coins $S_2 = 75.3253$ coins
3. $n_1 > 30$ and $n_2 > 30$: ✓ $n_1 = 1115 > 30$ $n_2 = 6475 > 30$

Rejection Critieria:
$\alpha = 0.05$ df = 1114



Reject H_o if $t > 1.65$

Test Statistic:

$$t = \frac{(\bar{x}_1 - \bar{x}_2) - (\mu_1 - \mu_2)}{\sqrt{\frac{S_1^2}{N_1} + \frac{S_2^2}{N_2}}}$$

$t = 20.39$
p-value < 0.0001

Reject H_o since $20.39 > 1.65$

Inputs:
$\bar{x}_1 = 59{,}318.4386$ (coins)
$\bar{x}_2 = 12{,}806.2626$ (coins)
$S_1 = 76{,}155.5146$ (coins)
$S_2 = 75.3253$ (coins)
$n_1 = 1{,}115$
$n_2 = 6{,}475$

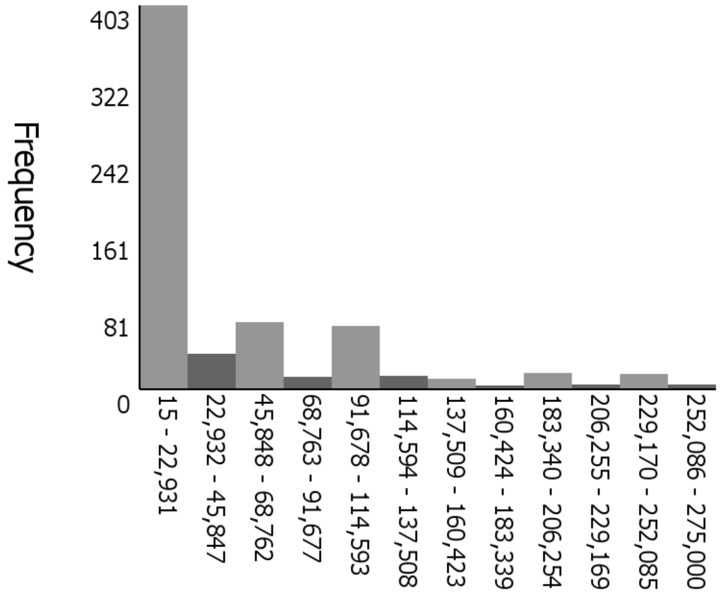
There is significant evidence at the α=0.05 level of significance to support the claim that the mean selling price of a night vision charm is greater than the mean cost of the materials required to make it.

Since we rejected H_o, it suggests that on average people earned more coins from selling this item than it would have cost them to buy the materials.

Implication: the test suggests that on average we could make a profit from flipping this item.

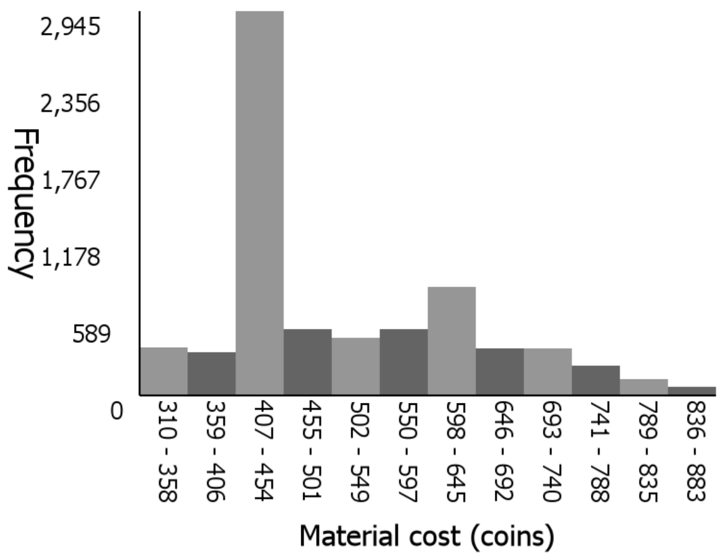
Selling prices and material costs of a day saver

Sell price distribution (outliers omitted)



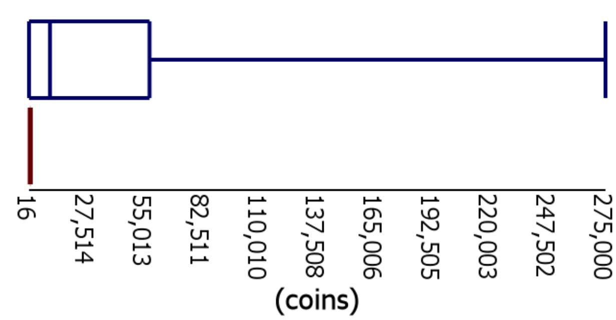
The distribution is centered around 10,000 coins (median). It has a high variability (IQR of 57,460 coins) and is skewed right. There are no large gaps in the distribution. There are 0 outliers on the low end and 124 outliers on the high end, the highest being 5,000,000 coins.

Material cost distribution (outliers omitted)

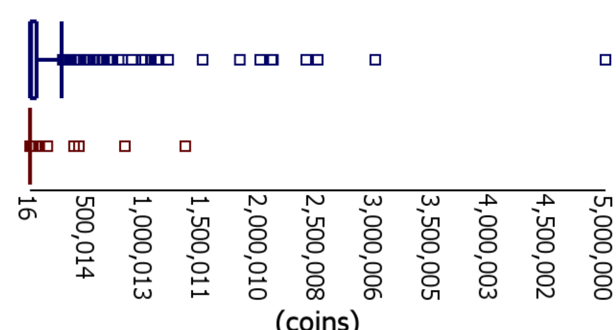


The distribution is centered around 450 coins (median). It has a low variability (IQR of 161 coins) and is skewed right. There are no large gaps in the distribution. There are 0 outliers on the low end and 399 outliers on the high end, the highest being 1,349,408 coins.

Price and cost distributions (outliers omitted)



Price and cost distributions (outliers included)



Key:

Sell Price

Material Cost

5 number summeries (coins):

min: 16, q1: 40, median: 10,000, q3: 57,500, max: 275,000

min: 311, q1: 439, median: 450, q3: 600, max: 883

Statistical test comparing the selling prices and material costs of a day saver

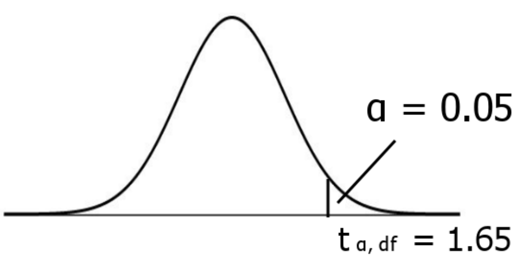
Let group1 = Sell prices of a day saver, group2 = Material cost of a day saver
X_1 = Sell price of a day saver (coins), X_2 = Material cost of a day saver (coins)
μ_1 = Mean sell price of a day saver (coins), μ_2 = Mean material cost of a day saver (coins)

H_o: $\mu_1 = \mu_2$ H_a: $\mu_1 > \mu_2$

Requirements for a difference of means test (σ_1 and σ_2 unknown):

1. 2 independent SRS's: ✓ $n_1 = 662$ $n_2 = 7089$
   One price/cost from either group will not affect any price/cost from either group
2. σ is not known, but S_X is: ✓ $S_1 = 63{,}972.2843$ coins $S_2 = 118.9685$ coins
3. $n_1 > 30$ and $n_2 > 30$: ✓ $n_1 = 662 > 30$ $n_2 = 7089 > 30$

Rejection Critieria:
$\alpha = 0.05$ df = 661



Reject H_o if $t > 1.65$

Test Statistic:

$$t = \frac{(\bar{x}_1 - \bar{x}_2) - (\mu_1 - \mu_2)}{\sqrt{\frac{S_1^2}{N_1} + \frac{S_2^2}{N_2}}}$$

$t = 16.64$
p-value < 0.0001

Reject H_o since $16.64 > 1.65$

Inputs:
$\bar{x}_1 = 41{,}891.0211$ (coins)
$\bar{x}_2 = 516.8935$ (coins)
$S_1 = 63{,}972.2843$ (coins)
$S_2 = 118.9685$ (coins)
$n_1 = 662$
$n_2 = 7{,}089$

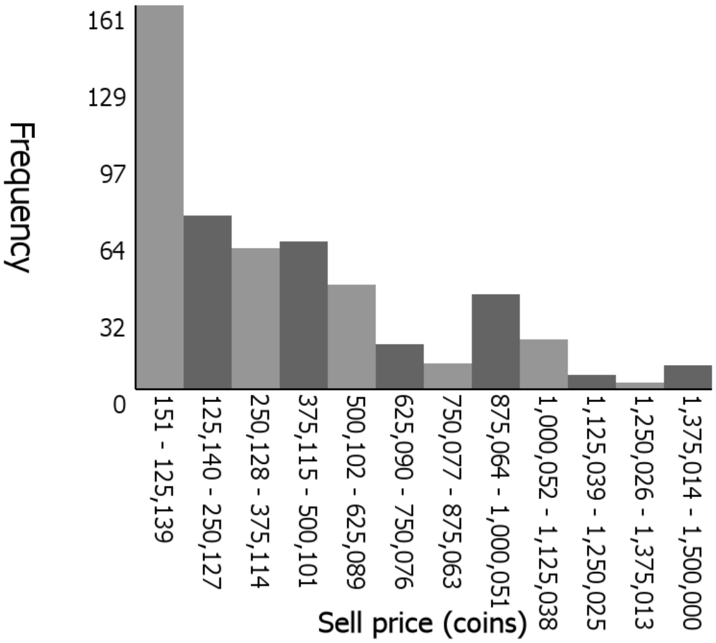
There is significant evidence at the α=0.05 level of significance to support the claim that the mean selling price of a day saver is greater than the mean cost of the materials required to make it.

Since we rejected H_o, it suggests that on average people earned more coins from selling this item than it would have cost them to buy the materials.

Implication: the test suggests that on average we could make a profit from flipping this item.

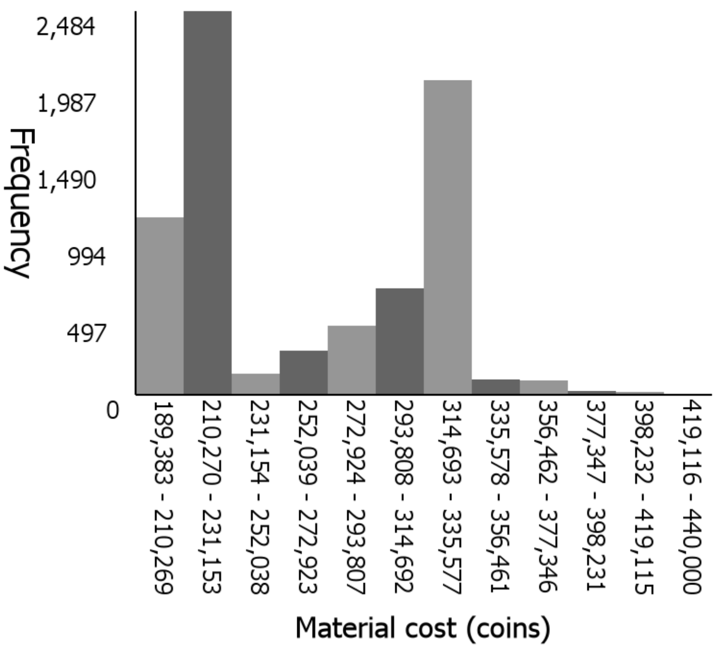
Selling prices and material costs of a piggy bank

Sell price distribution (outliers omitted)



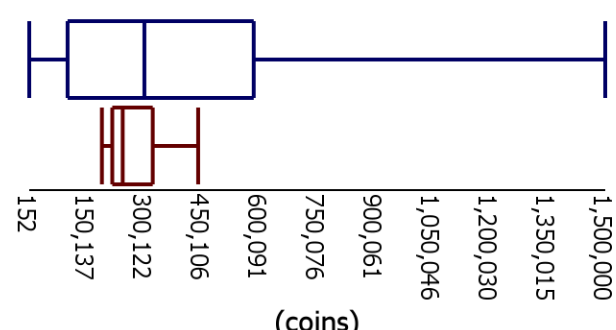
The distribution is centered around 300,000 coins (median). It has a low variability (IQR of 484,615 coins) and is skewed right. There are no large gaps in the distribution. There are 0 outliers on the low end and 31 outliers on the high end, the highest being 50,000,000 coins.

Material cost distribution (outliers omitted)

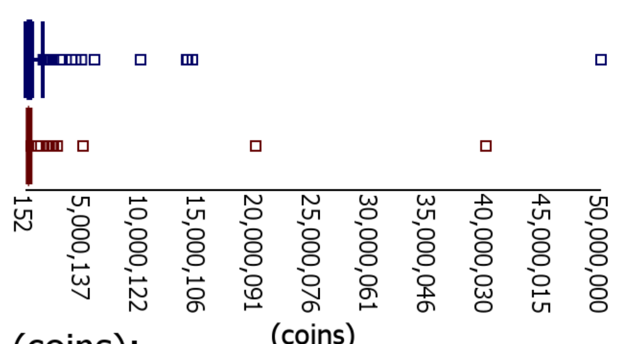


The distribution is centered around 243,495 coins (median). It has a low variability (IQR of 105,371 coins) and is skewed right. There are no large gaps in the distribution. There are 0 outliers on the low end and 19 outliers on the high end, the highest being 39,999,976 coins.

Price and cost distributions (outliers omitted)



Price and cost distributions (outliers included)



Key:

- Sell Price
- Material Cost

5 number summeries (coins):

min: 152, q1: 100,000, median: 300,000, q3: 584,615, max: 1,500,000

min: 189,384, q1: 216,344, median: 243,495, q3: 321,715, max: 440,000

Statistical test comparing the selling prices and material costs of a piggy bank

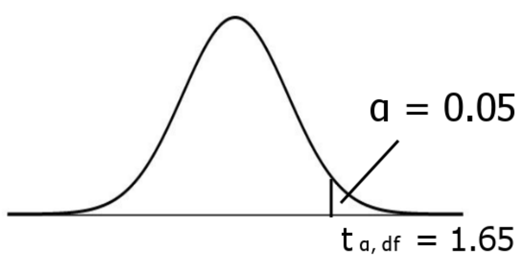
Let group1 = Sell prices of a piggy bank, group2 = Material cost of a piggy bank
X_1 = Sell price of a piggy bank (coins), X_2 = Material cost of a piggy bank (coins)
μ_1 = Mean sell price of a piggy bank (coins), μ_2 = Mean material cost of a piggy bank (coins)

$H_o: \mu_1 = \mu_2 \quad H_a: \mu_1 > \mu_2$

Requirements for a difference of means test (σ_1 and σ_2 unknown):

1. 2 independent SRS's: ✓ $n_1 = 509$ $n_2 = 7469$
   One price/cost from either group will not affect any price/cost from either group
2. σ is not known, but S_x is: ✓ $S_1 = 367{,}190.4413$ coins $S_2 = 52{,}248.0584$ coins
3. $n_1 > 30$ and $n_2 > 30$: ✓ $n_1 = 509 > 30$ $n_2 = 7469 > 30$

Rejection Critieria:
$\alpha = 0.05$ df = 508



Reject H_o if $t > 1.65$

Test Statistic:

$$t = \frac{(\bar{x}_1 - \bar{x}_2) - (\mu_1 - \mu_2)}{\sqrt{\frac{S_1^2}{N_1} + \frac{S_2^2}{N_2}}}$$

$t = 8.50$
p-value < 0.0001

Reject H_o since $8.50 > 1.65$

Inputs:
$\bar{x}_1 = 402{,}834.6523$ (coins)
$\bar{x}_2 = 264{,}354.8759$ (coins)
$S_1 = 367{,}190.4413$ (coins)
$S_2 = 52{,}248.0584$ (coins)
$n_1 = 509$
$n_2 = 7{,}469$

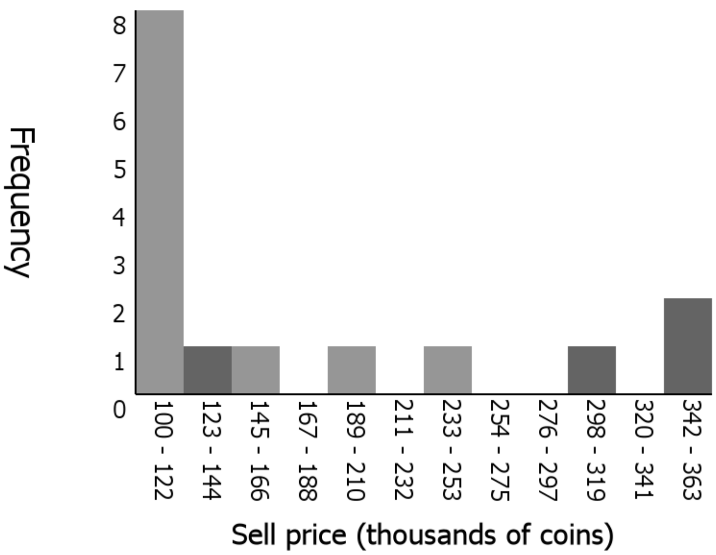
There is significant evidence at the α=0.05 level of significance to support the claim that the mean selling price of a piggy bank is greater than the mean cost of the materials required to make it.

Since we rejected H_o, it suggests that on average people earned more coins from selling this item than it would have cost them to buy the materials.

Implication: the test suggests that on average we could make a profit from flipping this item.

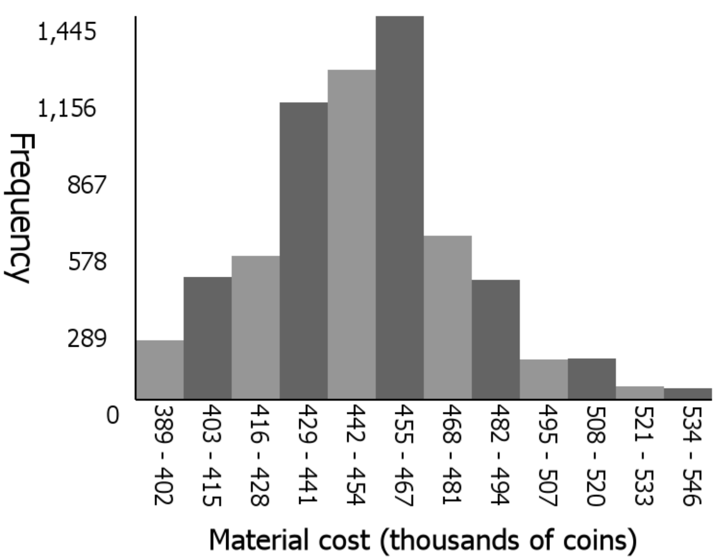
Selling prices and material costs of a protector dragon leggings

Sell price distribution (outliers omitted)



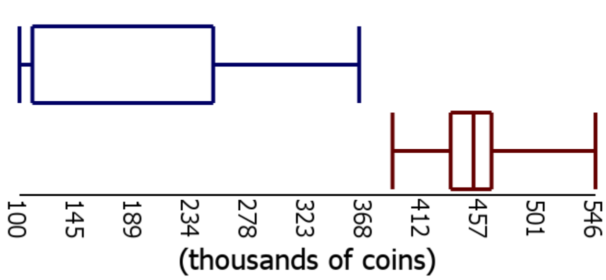
The distribution is centered around 110,000 coins (median). It has a low variability (IQR of 140,000 coins) and is skewed right. There are large gaps between 165,750 - 187,667 coins, 209,583 - 231,500 coins, 253,417 - 297,250 coins, and 319,167 - 341,083 coins. There are 0 outliers on the low end and 0 outliers on the high end.

Material cost distribution (outliers omitted)

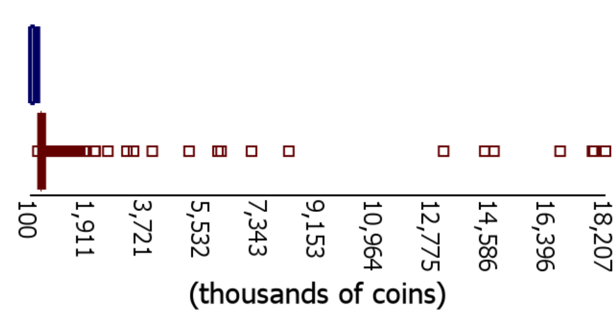


The distribution is centered around 451,544 coins (median). It has a low variability (IQR of 31,613 coins) and is mostly symmetrical. There are no large gaps in the distribution. There are 8 outliers on the low end, the lowest being 349,797 coins and 975 outliers on the high end, the highest being 18,206,936 coins.

Price and cost distributions (outliers omitted)



Price and cost distributions (outliers included)



Key:

- Sell Price
- Material Cost

5 number summeries (thousands of coins):

min: 100, q1: 110, median: 110, q3: 250, max: 363

min: 389, q1: 434, median: 452, q3: 465, max: 546

Statistical test comparing the selling prices and material costs of a protector dragon leggings

Let group1 = Sell prices of a protector dragon leggings, group2 = Material cost of a protector dragon leggings
X_1 = Sell price of a protector dragon leggings (coins), X_2 = Material cost of a protector dragon leggings (coins)
μ_1 = Mean sell price of a protector dragon leggings (coins),
μ_2 = Mean material cost of a protector dragon leggings (coins)

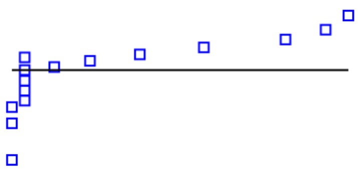
H_o: $\mu_1 = \mu_2$ H_a: $\mu_1 > \mu_2$

Requirements for a difference of means test (σ_1 and σ_2 unknown):

1. 2 independent SRS's: ✓ $n_1 = 15$ $n_2 = 6505$
   One price/cost from either group will not affect any price/cost from either group
2. σ is not known, but S_x is: ✓ S_1 = 96,286.135 coins S_2 = 27,499.3157 coins
3. Group1 is normally distributed and $n_2 > 30$: ✓

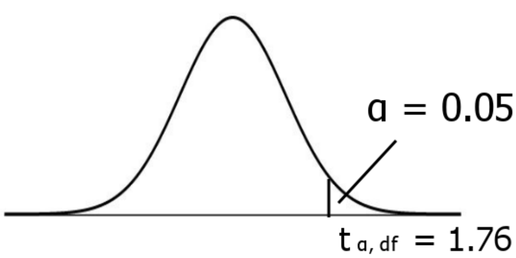
Quantile plot of sell prices

$n_2 = 6505 > 30$



Rejection Critieria:

$\alpha = 0.05$ df = 14



Reject H_o if $t > 1.76$

Test Statistic:

$$t = \frac{(\bar{x}_1 - \bar{x}_2) - (\mu_1 - \mu_2)}{\sqrt{\frac{S_1^2}{N_1} + \frac{S_2^2}{N_2}}}$$

$t = -11.14$
p-value > 0.9999

Inputs:

$\bar{x}_1$ = 174,414.8667 (coins)
$\bar{x}_2$ = 451,294.3197 (coins)
S_1 = 96,286.135 (coins)
S_2 = 27,499.3157 (coins)
n_1 = 15
n_2 = 6,505

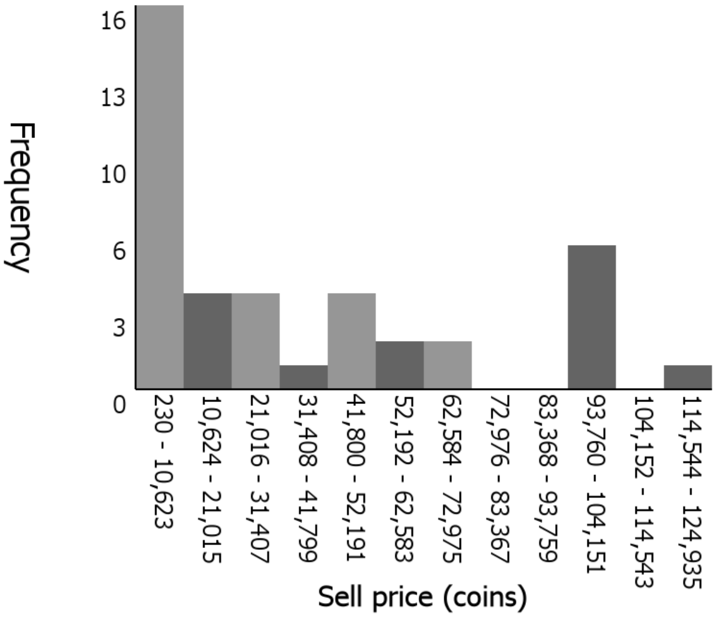
Fail to reject H_o since $-11.14 < 1.76$

There is not significant evidence at the α=0.05 level of significance to support the claim that the mean selling price of a protector dragon leggings is greater than the mean cost of the materials required to make it.

Since we failed to reject H_o, it suggests that on average people did not earn more coins from selling this item than it would have cost them to buy the materials.

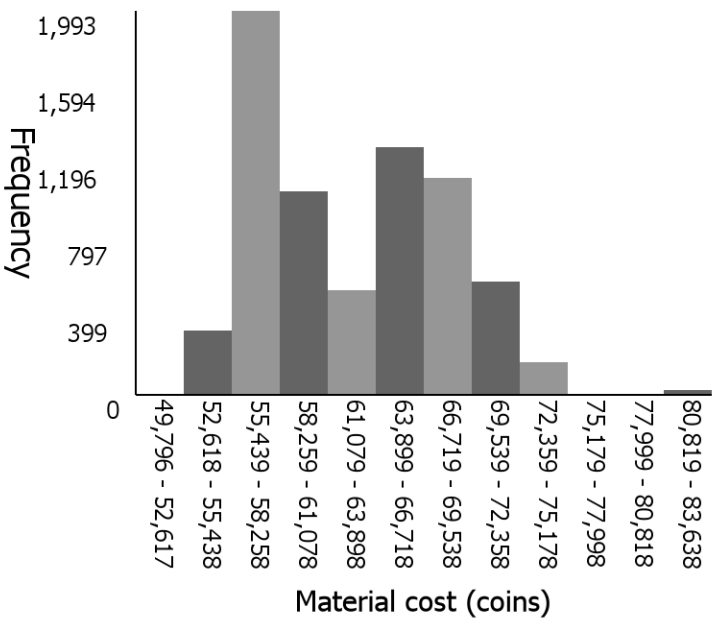
Selling prices and material costs of a <u>raggedy shark tooth necklace</u>

Sell price distribution (outliers omitted)



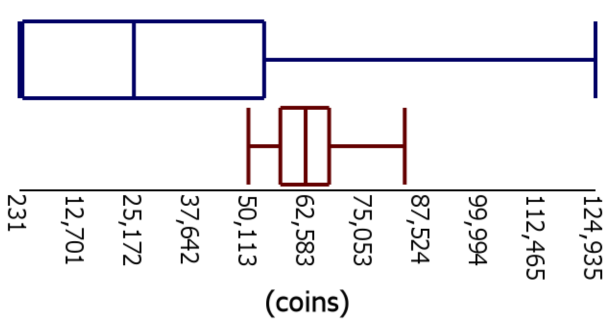
The distribution is centered around 25,000 coins (median). It has a moderate variability (IQR of 52,327 coins) and is skewed right. There are large gaps between 72,975 - 93,759 coins and 104,151 - 114,543 coins. There are 0 outliers on the low end and 3 outliers on the high end, the highest being 605,000 coins.

Material cost distribution (outliers omitted)

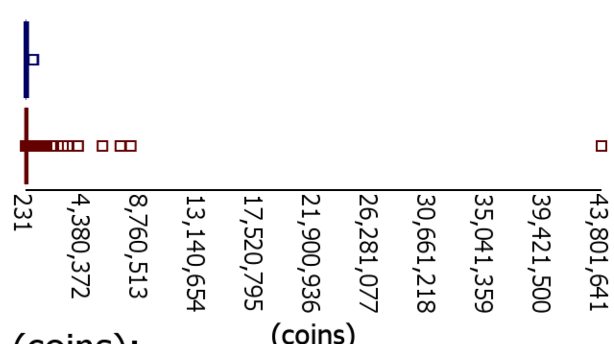


The distribution is centered around 62,176 coins (median). It has a low variability (IQR of 10,560 coins) and is mostly symmetrical. There is a large gap between 75,178 - 80,818 coins. There are 1 outliers on the low end, the lowest being 7,911 coins and 358 outliers on the high end, the highest being 43,801,641 coins.

Price and cost distributions (outliers omitted)



Price and cost distributions (outliers included)



Key:

Sell Price

Material Cost

5 number summeries (coins):

min: 231, q1: 874, median: 25,000, q3: 53,201, max: 124,935

min: 49,797, q1: 56,707, median: 62,176, q3: 67,268, max: 83,638

Statistical test comparing the selling prices and material costs of a <u>raggedy shark tooth necklace</u>

Let group1 = Sell prices of a raggedy shark tooth necklace, group2 = Material cost of a raggedy shark tooth necklace

X_1 = Sell price of a raggedy shark tooth necklace (coins), X_2 = Material cost of a raggedy shark tooth necklace (coins)

μ_1 = Mean sell price of a raggedy shark tooth necklace (coins),

μ_2 = Mean material cost of a raggedy shark tooth necklace (coins)

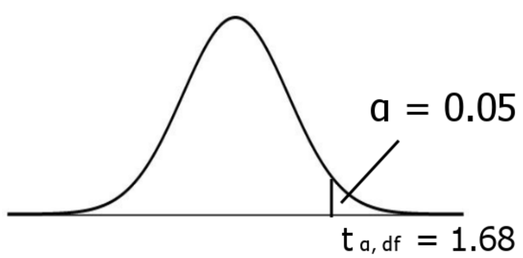
$H_o: \mu_1 = \mu_2 \quad H_a: \mu_1 > \mu_2$

<u>Requirements for a difference of means test (σ_1 and σ_2 unknown):</u>

1. 2 independent SRS's: ✓ $n_1 = 40$ $n_2 = 7129$
   One price/cost from either group will not affect any price/cost from either group
2. σ is not known, but S_X is: ✓ S_1 = 38,207.9321 coins S_2 = 5,642.5459 coins
3. $n_1 > 30$ and $n_2 > 30$: ✓ $n_1 = 40 > 30$ $n_2 = 7129 > 30$

<u>Rejection Critieria:</u>

$\alpha = 0.05$ df = 39



Reject H_o if $t > 1.68$

<u>Test Statistic:</u>

$$t = \frac{(\bar{x}_1 - \bar{x}_2) - (\mu_1 - \mu_2)}{\sqrt{\frac{S_1^2}{N_1} + \frac{S_2^2}{N_2}}}$$

$t = -4.52$

p-value > 0.9999

Inputs:

$\bar{x}_1$ = 34,970.325 (coins)

$\bar{x}_2$ = 62,277.0088 (coins)

S_1 = 38,207.9321 (coins)

S_2 = 5,642.5459 (coins)

$n_1 = 40$

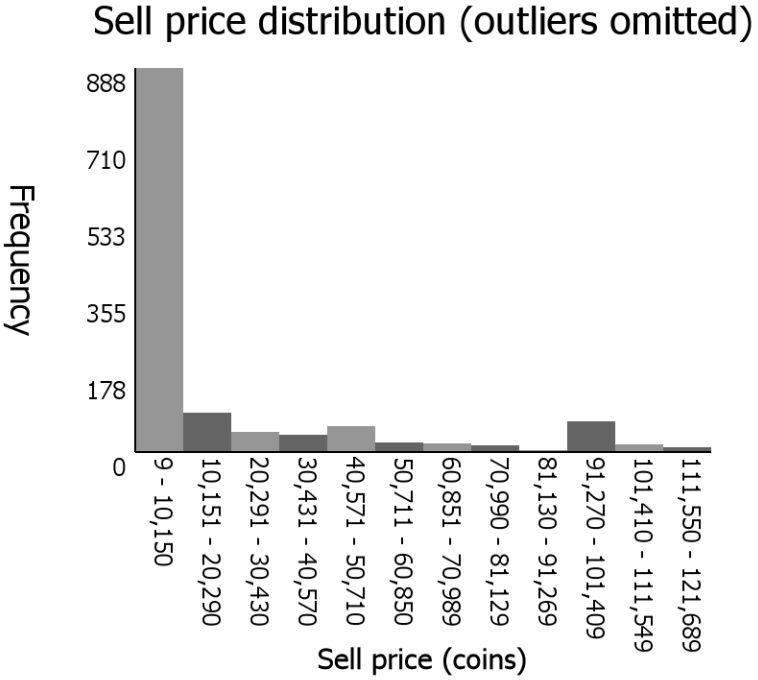
n_2 = 7,129

Fail to reject H_o since $-4.52 < 1.68$

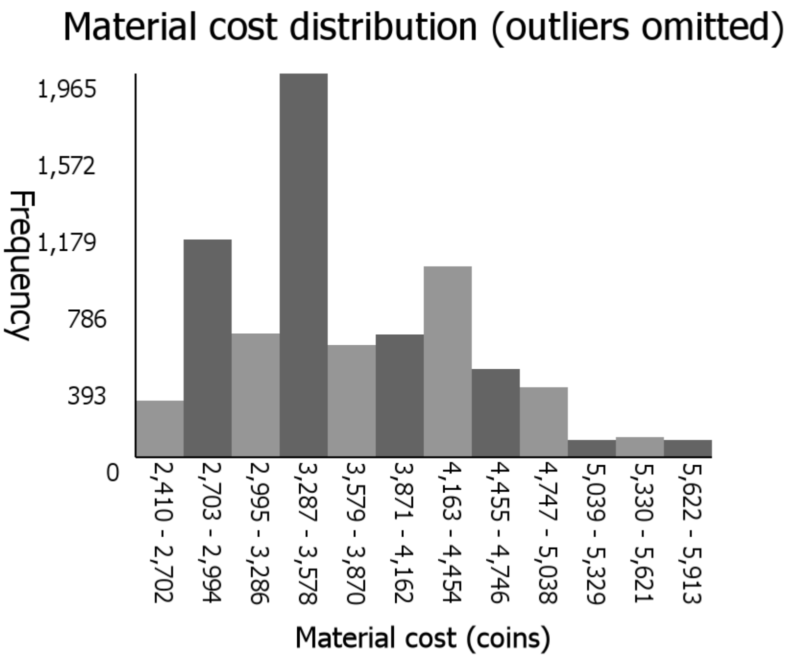
There is not significant evidence at the α=0.05 level of significance to support the claim that the mean selling price of a raggedy shark tooth necklace is greater than the mean cost of the materials required to make it.

Since we failed to reject H_o, it suggests that on average people did not earn more coins from selling this item than it would have cost them to buy the materials.

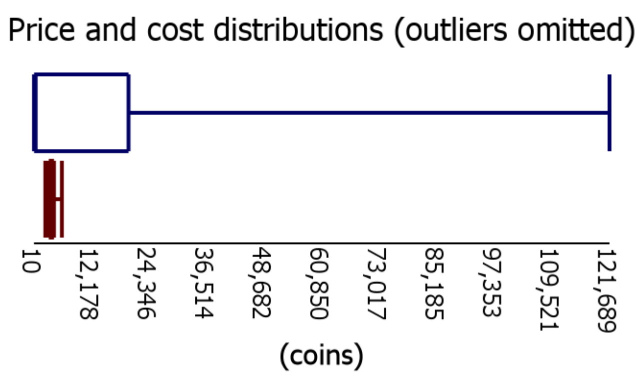
Selling prices and material costs of a magical water bucket

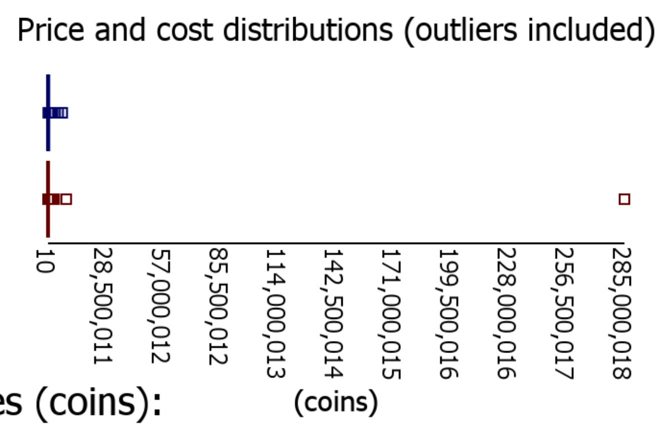


The distribution is centered around 374 coins (median). It has a high variability (IQR of 19,954 coins) and is skewed right. There are no large gaps in the distribution. There are 0 outliers on the low end and 165 outliers on the high end, the highest being 7,000,000 coins.



The distribution is centered around 3,482 coins (median). It has a low variability (IQR of 1,095 coins) and is skewed right. There are no large gaps in the distribution. There are 0 outliers on the low end and 216 outliers on the high end, the highest being 285,000,018 coins.





Key:

Sell Price

Material Cost

5 number summeries (coins):

min: 10, q1: 46, median: 374, q3: 20,000, max: 121,689

min: 2,411, q1: 3,142, median: 3,482, q3: 4,237, max: 5,913

Statistical test comparing the selling prices and material costs of a magical water bucket

Let group1 = Sell prices of a magical water bucket, group2 = Material cost of a magical water bucket
X_1 = Sell price of a magical water bucket (coins), X_2 = Material cost of a magical water bucket (coins)
μ_1 = Mean sell price of a magical water bucket (coins), μ_2 = Mean material cost of a magical water bucket (coins)

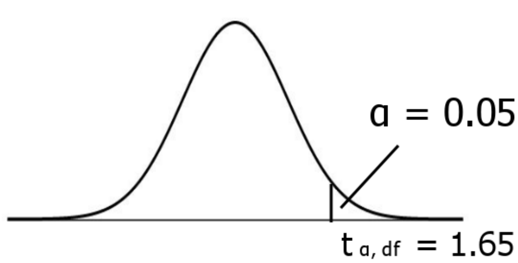
$H_o: \mu_1 = \mu_2$ $\quad H_a: \mu_1 > \mu_2$

Requirements for a difference of means test (σ_1 and σ_2 unknown):

1. 2 independent SRS's: ✓ $n_1 = 1288$ $n_2 = 7272$
   One price/cost from either group will not affect any price/cost from either group
2. σ is not known, but S_x is: ✓ $S_1 = 30{,}959.4111$ coins $S_2 = 740.3239$ coins
3. $n_1 > 30$ and $n_2 > 30$: ✓ $n_1 = 1288 > 30$ $n_2 = 7272 > 30$

Rejection Critieria:

$\alpha = 0.05$ df = 1287



Reject H_o if $t > 1.65$

Test Statistic:

$$t = \frac{(\bar{x}_1 - \bar{x}_2) - (\mu_1 - \mu_2)}{\sqrt{\frac{S_1^2}{N_1} + \frac{S_2^2}{N_2}}}$$

$t = 16.42$
p-value < 0.0001

Reject H_o since $16.42 > 1.65$

Inputs:

$\bar{x}_1 = 17{,}835.8144$ (coins)
$\bar{x}_2 = 3{,}669.5659$ (coins)
$S_1 = 30{,}959.4111$ (coins)
$S_2 = 740.3239$ (coins)
$n_1 = 1{,}288$
$n_2 = 7{,}272$

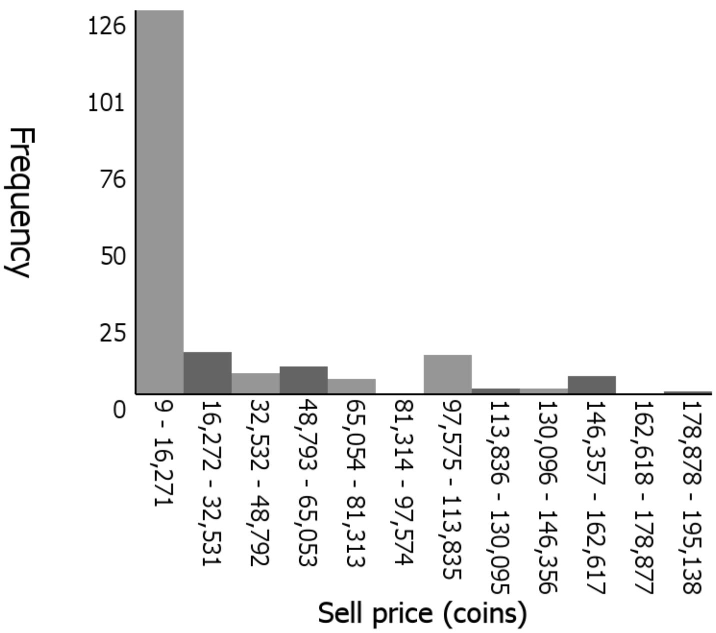
There is significant evidence at the α=0.05 level of significance to support the claim that the mean selling price of a magical water bucket is greater than the mean cost of the materials required to make it.

Since we rejected H_o, it suggests that on average people earned more coins from selling this item than it would have cost them to buy the materials.

Implication: the test suggests that on average we could make a profit from flipping this item.

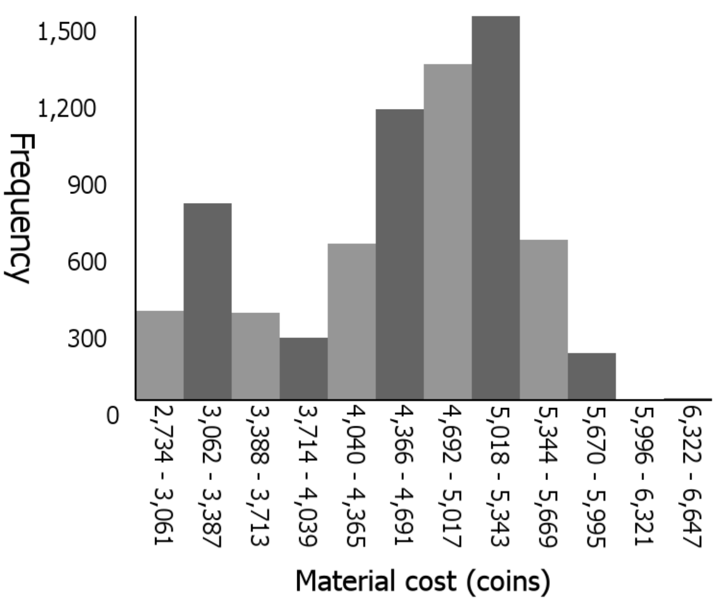
Selling prices and material costs of a gravity talisman

Sell price distribution (outliers omitted)



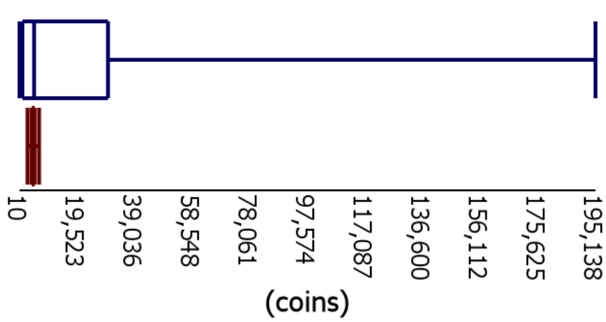
The distribution is centered around 4,968 coins (median). It has a high variability (IQR of 29,000 coins) and is skewed right. There are large gaps between 81,313 - 97,574 coins and 162,617 - 178,877 coins. There are 0 outliers on the low end and 29 outliers on the high end, the highest being 29,000,000 coins.

Material cost distribution (outliers omitted)

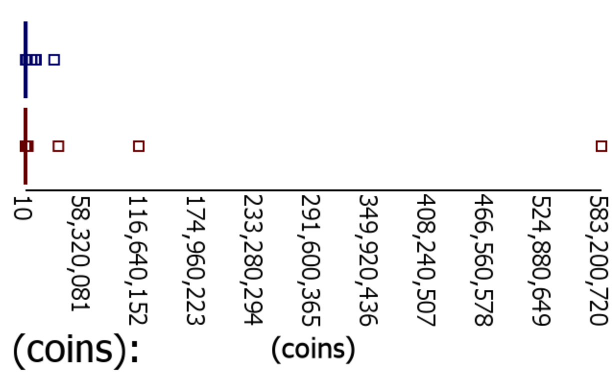


The distribution is centered around 4,715 coins (median). It has a low variability (IQR of 979 coins) and is mostly symmetrical. There are no large gaps in the distribution. There are 9 outliers on the low end, the lowest being 2,491 coins and 387 outliers on the high end, the highest being 583,200,720 coins.

Price and cost distributions (outliers omitted)



Price and cost distributions (outliers included)



Key:

Sell Price

Material Cost

5 number summeries (coins):

min: 10, q1: 1,000, median: 4,968, q3: 30,000, max: 195,138

min: 2,735, q1: 4,162, median: 4,715, q3: 5,141, max: 6,647

Statistical test comparing the selling prices and material costs of a <u>gravity talisman</u>

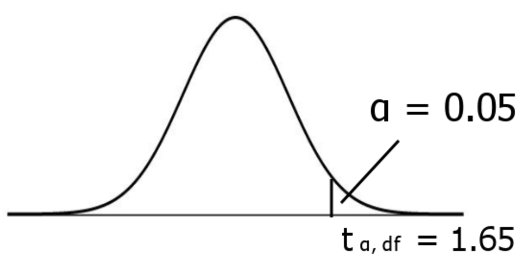
Let group1 = Sell prices of a gravity talisman, group2 = Material cost of a gravity talisman
X_1 = Sell price of a gravity talisman (coins), X_2 = Material cost of a gravity talisman (coins)
μ_1 = Mean sell price of a gravity talisman (coins), μ_2 = Mean material cost of a gravity talisman (coins)

H_o: $\mu_1 = \mu_2$ H_a: $\mu_1 > \mu_2$

<u>Requirements for a difference of means test (σ_1 and σ_2 unknown):</u>

1. 2 independent SRS's: ✓ $n_1 = 185$ $n_2 = 7092$
   One price/cost from either group will not affect any price/cost from either group
2. σ is not known, but S_x is: ✓ S_1 = 41,494.2032 coins S_2 = 773.5356 coins
3. $n_1 > 30$ and $n_2 > 30$: ✓ $n_1 = 185 > 30$ $n_2 = 7092 > 30$

<u>Rejection Critieria:</u>
$\alpha = 0.05$ df = 184



Reject H_o if $t > 1.65$

<u>Test Statistic:</u>

$$t = \frac{(\bar{x}_1 - \bar{x}_2) - (\mu_1 - \mu_2)}{\sqrt{\frac{S_1^2}{N_1} + \frac{S_2^2}{N_2}}}$$

Inputs:
$\bar{x}_1$ = 25,908.5297 (coins)
$\bar{x}_2$ = 4,526.5779 (coins)
S_1 = 41,494.2032 (coins)
S_2 = 773.5356 (coins)
n_1 = 185
n_2 = 7,092

$t = 7.01$
p-value < 0.0001

Reject H_o since $7.01 > 1.65$

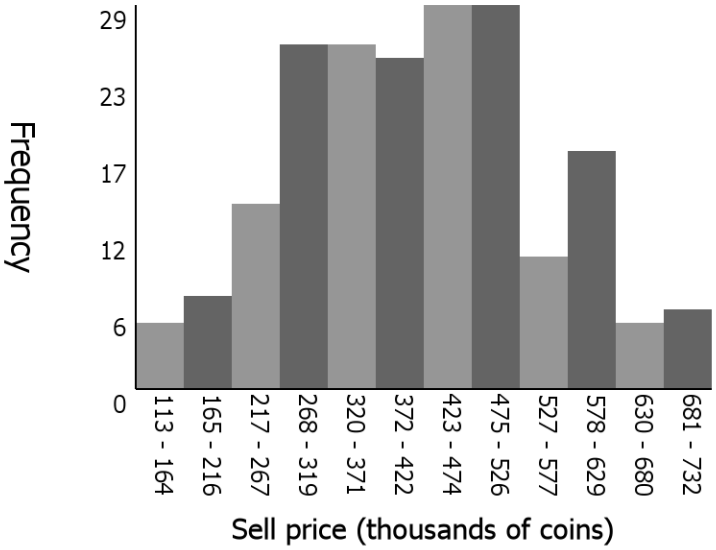
There is significant evidence at the α=0.05 level of significance to support the claim that the mean selling price of a gravity talisman is greater than the mean cost of the materials required to make it.

Since we rejected H_o, it suggests that on average people earned more coins from selling this item than it would have cost them to buy the materials.

Implication: the test suggests that on average we could make a profit from flipping this item.

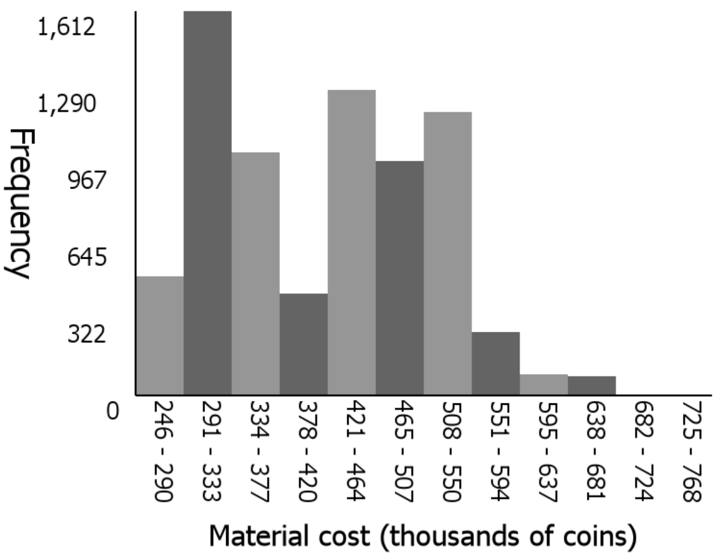
Selling prices and material costs of an aspect of the end

Sell price distribution (outliers omitted)



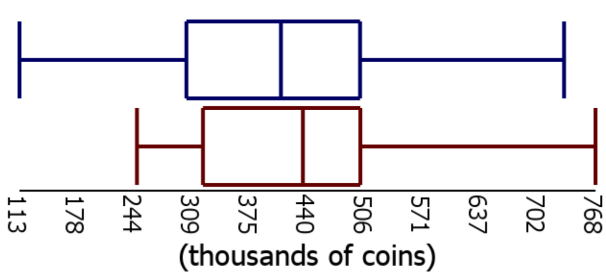
The distribution is centered around 410,000 coins (median). It has a low variability (IQR of 197,500 coins) and is mostly symmetrical. There are no large gaps in the distribution. There are 0 outliers on the low end and 12 outliers on the high end, the highest being 15,900,000 coins.

Material cost distribution (outliers omitted)

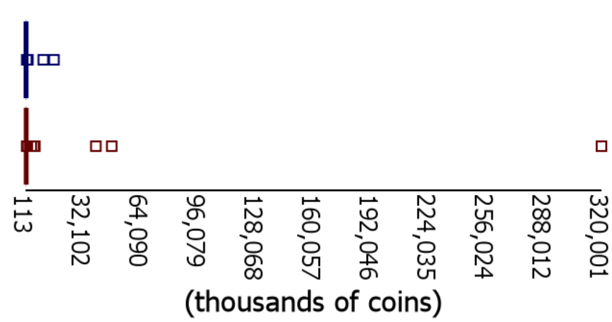


The distribution is centered around 434,982 coins (median). It has a low variability (IQR of 179,004 coins) and is mostly symmetrical. There are no large gaps in the distribution. There are 0 outliers on the low end and 32 outliers on the high end, the highest being 320,001,303 coins.

Price and cost distributions (outliers omitted)



Price and cost distributions (outliers included)



Key:

Sell Price

Material Cost

5 number summeries (thousands of coins):

min: 113, q1: 303, median: 410, q3: 500, max: 732

min: 246, q1: 321, median: 435, q3: 500, max: 768

Statistical test comparing the selling prices and material costs of an aspect of the end

Let group1 = Sell prices of an aspect of the end, group2 = Material cost of an aspect of the end
X_1 = Sell price of an aspect of the end (coins), X_2 = Material cost of an aspect of the end (coins)
μ_1 = Mean sell price of an aspect of the end (coins), μ_2 = Mean material cost of an aspect of the end (coins)

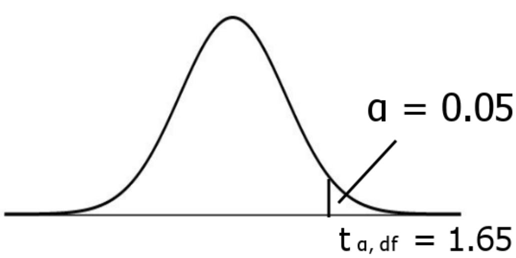
$H_o: \mu_1 = \mu_2 \quad H_a: \mu_1 > \mu_2$

Requirements for a difference of means test (σ_1 and σ_2 unknown):

1. 2 independent SRS's: ✓ $n_1 = 200$ $n_2 = 7456$
   One price/cost from either group will not affect any price/cost from either group
2. σ is not known, but S_x is: ✓ $S_1 = 134{,}869.16$ coins $S_2 = 97{,}300.7607$ coins
3. $n_1 > 30$ and $n_2 > 30$: ✓ $n_1 = 200 > 30$ $n_2 = 7456 > 30$

Rejection Critieria:

$\alpha = 0.05$ df = 199



Reject H_o if $t > 1.65$

Test Statistic:

$$t = \frac{(\bar{x}_1 - \bar{x}_2) - (\mu_1 - \mu_2)}{\sqrt{\frac{S_1^2}{N_1} + \frac{S_2^2}{N_2}}}$$

$t = -0.23$
p-value = 0.5901

Inputs:

$\bar{x}_1 = 413{,}107.485$ (coins)
$\bar{x}_2 = 415{,}297.1168$ (coins)
$S_1 = 134{,}869.16$ (coins)
$S_2 = 97{,}300.7607$ (coins)
$n_1 = 200$
$n_2 = 7{,}456$

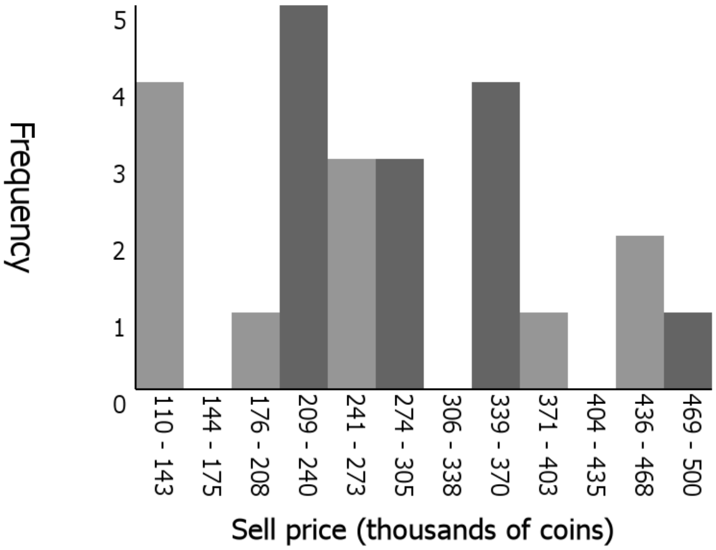
Fail to reject H_o since $-0.23 < 1.65$

There is not significant evidence at the $\alpha=0.05$ level of significance to support the claim that the mean selling price of an aspect of the end is greater than the mean cost of the materials required to make it.

Since we failed to reject H_o, it suggests that on average people did not earn more coins from selling this item than it would have cost them to buy the materials.

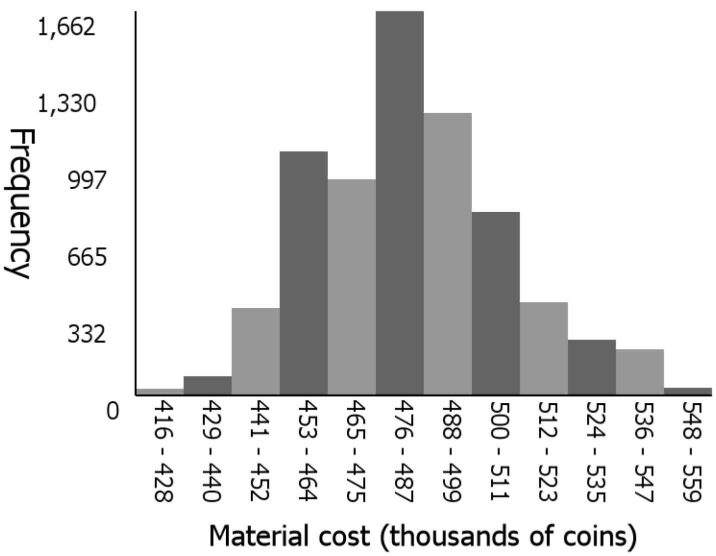
Selling prices and material costs of an unstable dragon chestplate

Sell price distribution (outliers omitted)



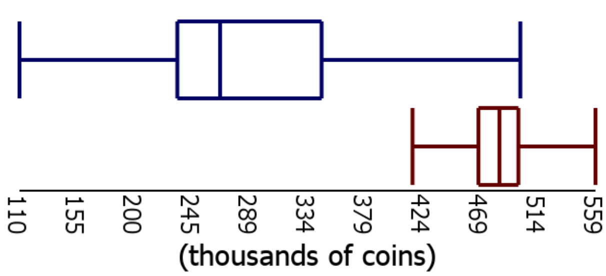
The distribution is centered around 266,200 coins (median). It has a low variability (IQR of 112,303 coins) and is mostly symmetrical. There are large gaps between 142,500 - 175,000 coins, 305,000 - 337,500 coins, and 402,500 - 435,000 coins. There are 0 outliers on the low end and 1 outliers on the high end, the highest being 644,204 coins.

Material cost distribution (outliers omitted)

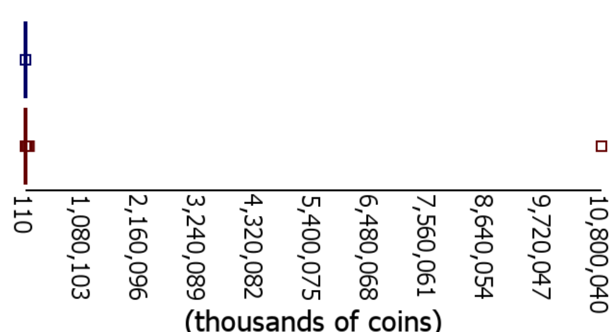


The distribution is centered around 483,724 coins (median). It has a low variability (IQR of 31,091 coins) and is mostly symmetrical. There are no large gaps in the distribution. There are 4 outliers on the low end, the lowest being 338,016 coins and 445 outliers on the high end, the highest being 10,800,040,077 coins.

Price and cost distributions (outliers omitted)



Price and cost distributions (outliers included)



Key:

Sell Price

Material Cost

5 number summeries (thousands of coins):

min: 110, q1: 233, median: 266, q3: 345, max: 500

min: 416, q1: 467, median: 484, q3: 498, max: 559

Statistical test comparing the selling prices and material costs of an unstable dragon chestplate

Let group1 = Sell prices of an unstable dragon chestplate, group2 = Material cost of an unstable dragon chestplate

X_1 = Sell price of an unstable dragon chestplate (coins), X_2 = Material cost of an unstable dragon chestplate (coins)

μ_1 = Mean sell price of an unstable dragon chestplate (coins),

μ_2 = Mean material cost of an unstable dragon chestplate (coins)

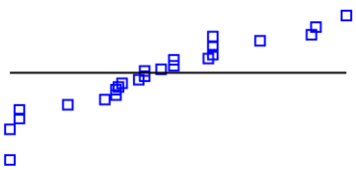
H_o: $\mu_1 = \mu_2$ H_a: $\mu_1 > \mu_2$

Requirements for a difference of means test (σ_1 and σ_2 unknown):

1. 2 independent SRS's: ✓ $n_1 = 24$ $n_2 = 7039$

   One price/cost from either group will not affect any price/cost from either group
2. σ is not known, but S_x is: ✓ S_1 = 109,860.7849 coins S_2 = 23,525.8465 coins
3. Group1 is normally distributed and $n_2 > 30$: ✓

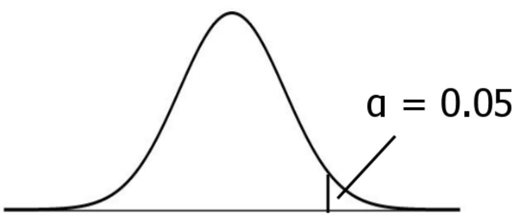
Quantile plot of sell prices



$n_2 = 7039 > 30$

Rejection Critieria:

$\alpha = 0.05$ df = 23



Reject H_o if $t > 1.72$

Test Statistic:

$$t = \frac{(\bar{x}_1 - \bar{x}_2) - (\mu_1 - \mu_2)}{\sqrt{\frac{S_1^2}{N_1} + \frac{S_2^2}{N_2}}}$$

$t = -9.19$

p-value > 0.9999

Inputs:

$\bar{x}_1$ = 278,241.9167 (coins)

$\bar{x}_2$ = 484,385.5352 (coins)

S_1 = 109,860.7849 (coins)

S_2 = 23,525.8465 (coins)

$n_1 = 24$

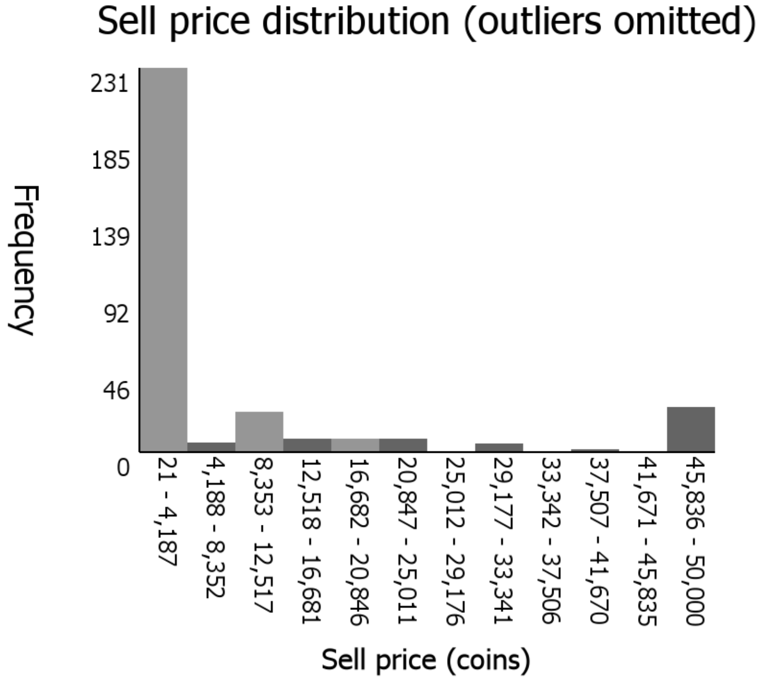
n_2 = 7,039

Fail to reject H_o since $-9.19 < 1.72$

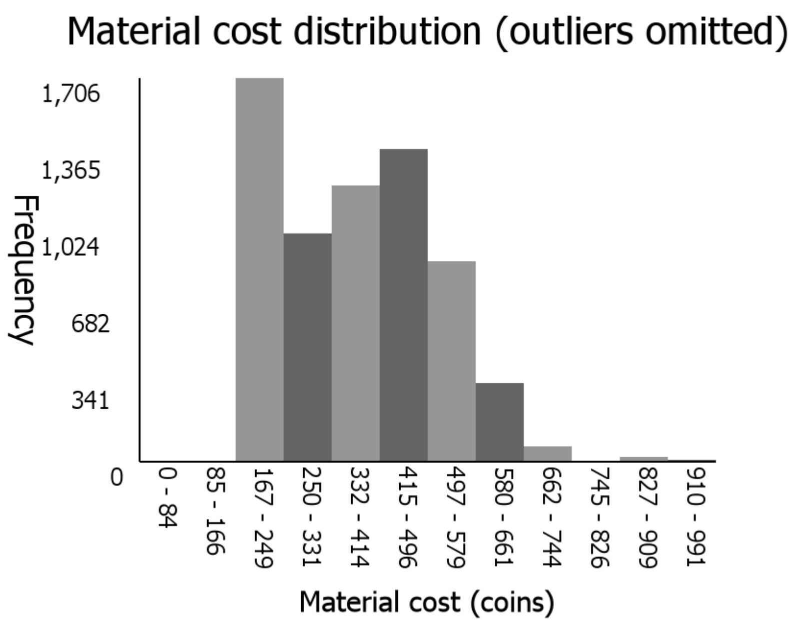
There is not significant evidence at the α=0.05 level of significance to support the claim that the mean selling price of an unstable dragon chestplate is greater than the mean cost of the materials required to make it.

Since we failed to reject H_o, it suggests that on average people did not earn more coins from selling this item than it would have cost them to buy the materials.

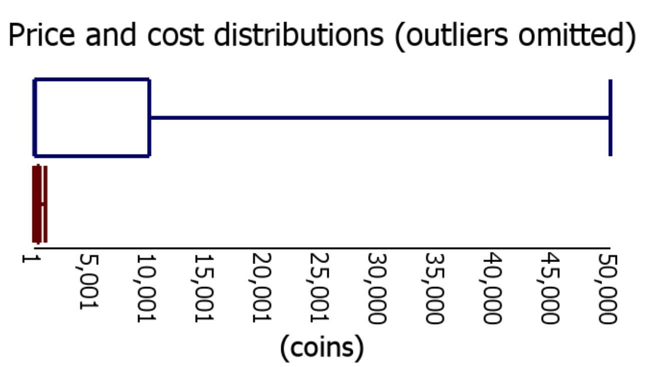
Selling prices and material costs of a vaccine talisman

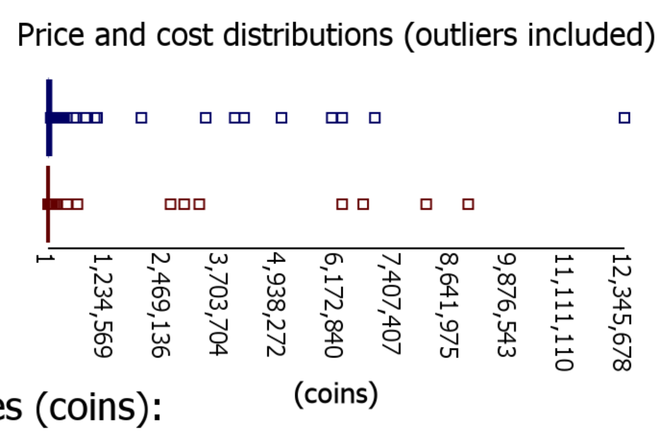


The distribution is centered around 100 coins (median). It has a high variability (IQR of 9,975 coins) and is skewed right. There are large gaps between 25,011 - 29,176 coins, 33,341 - 37,506 coins, and 41,670 - 45,835 coins. There are 0 outliers on the low end and 53 outliers on the high end, the highest being 12,345,678 coins.



The distribution is centered around 371 coins (median). It has a low variability (IQR of 243 coins) and is mostly symmetrical. There is a large gap between 84 - 166 coins. There are 0 outliers on the low end and 808 outliers on the high end, the highest being 8,999,999 coins.





Key:

Sell Price

Material Cost

5 number summeries (coins):

min: 22, q1: 25, median: 100, q3: 10,000, max: 50,000

min: 1, q1: 243, median: 371, q3: 487, max: 991

Statistical test comparing the selling prices and material costs of a vaccine talisman

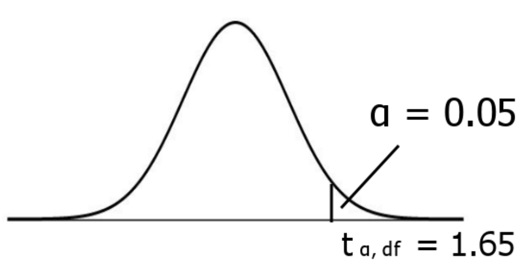
Let group1 = Sell prices of a vaccine talisman, group2 = Material cost of a vaccine talisman
X_1 = Sell price of a vaccine talisman (coins), X_2 = Material cost of a vaccine talisman (coins)
μ_1 = Mean sell price of a vaccine talisman (coins), μ_2 = Mean material cost of a vaccine talisman (coins)

H_o: $\mu_1 = \mu_2$ H_a: $\mu_1 > \mu_2$

Requirements for a difference of means test (σ_1 and σ_2 unknown):

1. 2 independent SRS's: ✓ $n_1 = 319$ $n_2 = 6680$
   One price/cost from either group will not affect any price/cost from either group
2. σ is not known, but S_x is: ✓ $S_1 = 14{,}775.2507$ coins $S_2 = 140.7624$ coins
3. $n_1 > 30$ and $n_2 > 30$: ✓ $n_1 = 319 > 30$ $n_2 = 6680 > 30$

Rejection Critieria:
$\alpha = 0.05$ df = 318



Reject H_o if $t > 1.65$

Test Statistic:

$$t = \frac{(\bar{x}_1 - \bar{x}_2) - (\mu_1 - \mu_2)}{\sqrt{\frac{S_1^2}{N_1} + \frac{S_2^2}{N_2}}}$$

$t = 8.63$
p-value < 0.0001

Reject H_o since $8.63 > 1.65$

Inputs:
$\bar{x}_1 = 7{,}517.8433$ (coins)
$\bar{x}_2 = 380.968$ (coins)
$S_1 = 14{,}775.2507$ (coins)
$S_2 = 140.7624$ (coins)
$n_1 = 319$
$n_2 = 6{,}680$

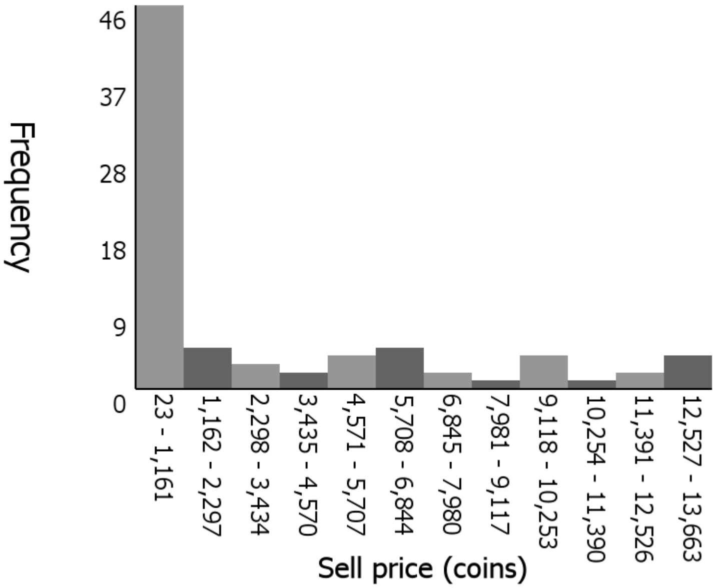
There is significant evidence at the $\alpha=0.05$ level of significance to support the claim that the mean selling price of a vaccine talisman is greater than the mean cost of the materials required to make it.

Since we rejected H_o, it suggests that on average people earned more coins from selling this item than it would have cost them to buy the materials.

Implication: the test suggests that on average we could make a profit from flipping this item.

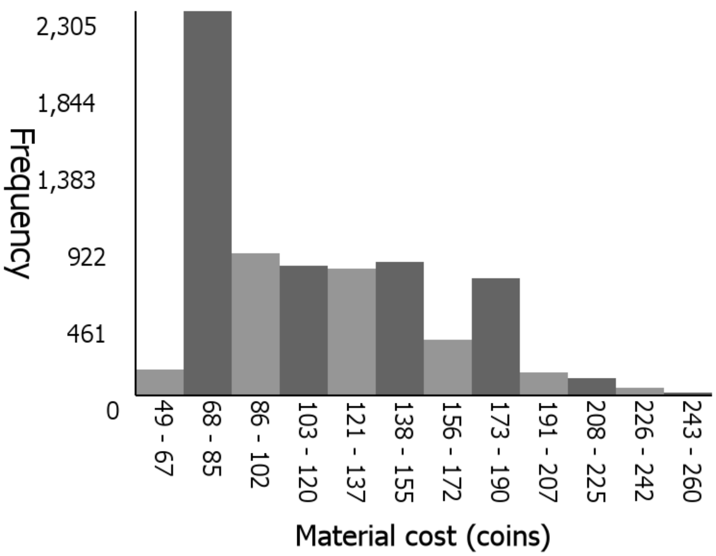
Selling prices and material costs of a <u>fish hat</u>

Sell price distribution (outliers omitted)



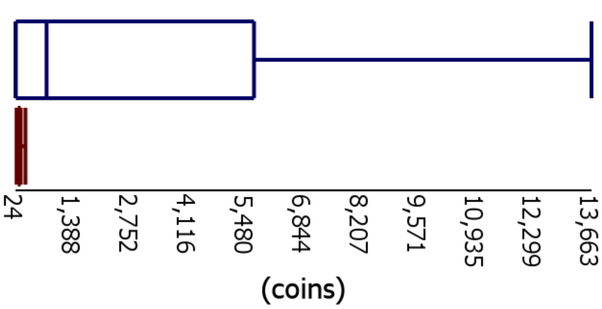
The distribution is centered around 760 coins (median). It has a high variability (IQR of 5,640 coins) and is skewed right. There are no large gaps in the distribution. There are 0 outliers on the low end and 7 outliers on the high end, the highest being 199,000 coins.

Material cost distribution (outliers omitted)

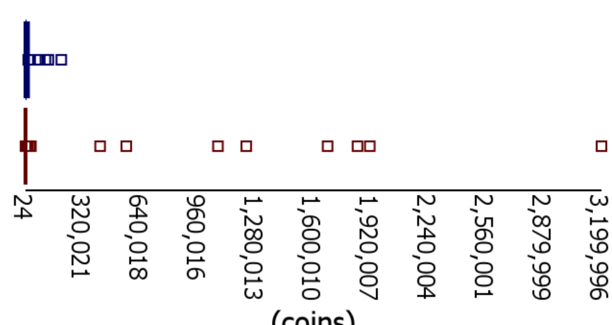


The distribution is centered around 106 coins (median). It has a low variability (IQR of 69 coins) and is skewed right. There are no large gaps in the distribution. There are 0 outliers on the low end and 491 outliers on the high end, the highest being 3,199,996 coins.

Price and cost distributions (outliers omitted)



Price and cost distributions (outliers included)



Key:

Sell Price

Material Cost

5 number summeries (coins):

min: 24, q1: 32, median: 760, q3: 5,672, max: 13,663

min: 50, q1: 78, median: 106, q3: 147, max: 260

Statistical test comparing the selling prices and material costs of a fish hat

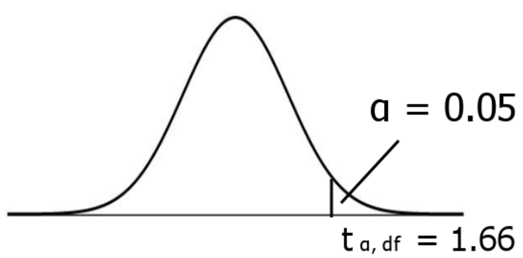
Let group1 = Sell prices of a fish hat, group2 = Material cost of a fish hat
X_1 = Sell price of a fish hat (coins), X_2 = Material cost of a fish hat (coins)
μ_1 = Mean sell price of a fish hat (coins), μ_2 = Mean material cost of a fish hat (coins)

H_o: $\mu_1 = \mu_2$ H_a: $\mu_1 > \mu_2$

Requirements for a difference of means test (σ_1 and σ_2 unknown):

1. 2 independent SRS's: ✓ $n_1 = 79$ $n_2 = 6997$
   One price/cost from either group will not affect any price/cost from either group
2. σ is not known, but S_x is: ✓ S_1 = 4,103.4536 coins S_2 = 41.7451 coins
3. $n_1 > 30$ and $n_2 > 30$: ✓ $n_1 = 79 > 30$ $n_2 = 6997 > 30$

Rejection Critieria:
$\alpha = 0.05$ df = 78



Reject H_o if $t > 1.66$

Test Statistic:

$$t = \frac{(\bar{x}_1 - \bar{x}_2) - (\mu_1 - \mu_2)}{\sqrt{\frac{S_1^2}{N_1} + \frac{S_2^2}{N_2}}}$$

$t = 6.19$
p-value < 0.0001

Reject H_o since $6.19 > 1.66$

Inputs:
$\bar{x}_1$ = 2,972.7215 (coins)
$\bar{x}_2$ = 116.3167 (coins)
S_1 = 4,103.4536 (coins)
S_2 = 41.7451 (coins)
n_1 = 79
n_2 = 6,997

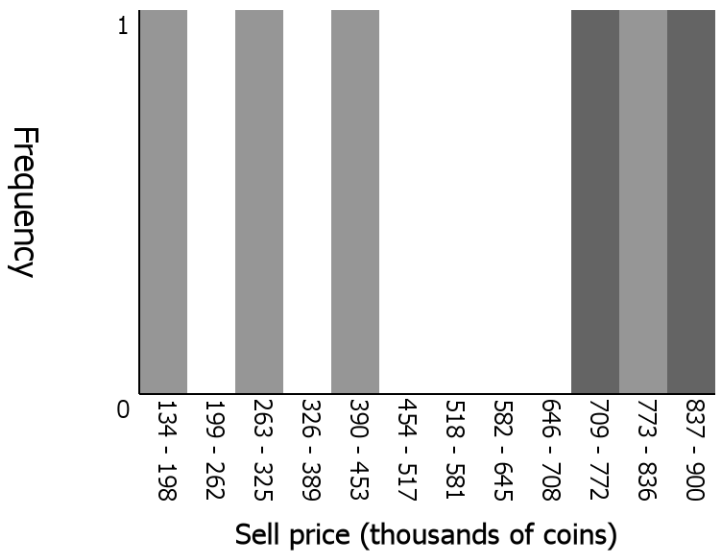
There is significant evidence at the α=0.05 level of significance to support the claim that the mean selling price of a fish hat is greater than the mean cost of the materials required to make it.

Since we rejected H_o, it suggests that on average people earned more coins from selling this item than it would have cost them to buy the materials.

Implication: the test suggests that on average we could make a profit from flipping this item.

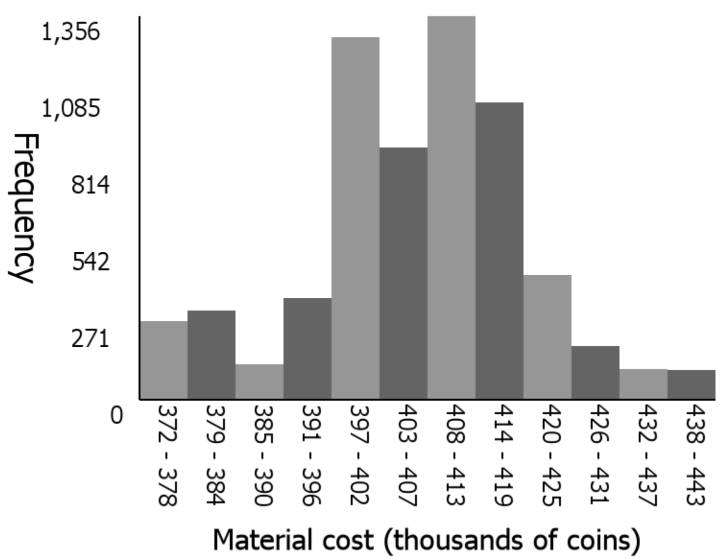
Selling prices and material costs of a beacon i

Sell price distribution (outliers omitted)



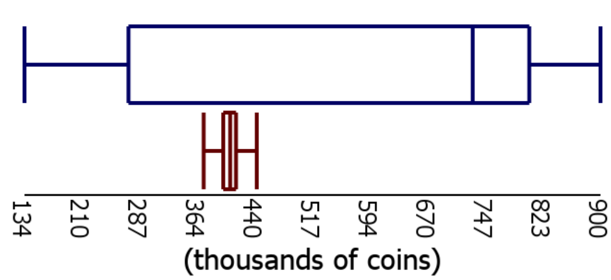
The distribution is centered around 730,000 coins (median). It has a low variability (IQR of 533,063 coins) and is skewed left. There are large gaps between 197,702 - 261,548 coins, 325,393 - 389,238 coins, and 453,083 - 708,464 coins. There are 0 outliers on the low end and 0 outliers on the high end.

Material cost distribution (outliers omitted)

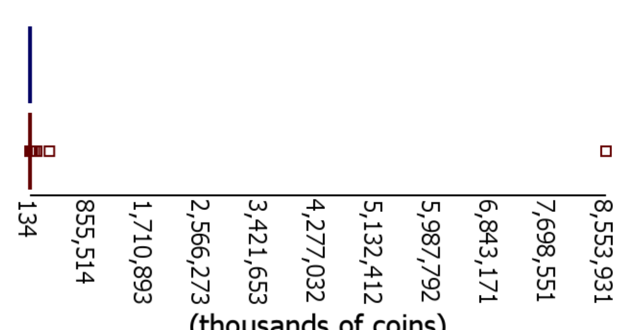


The distribution is centered around 407,473 coins (median). It has a low variability (IQR of 16,970 coins) and is mostly symmetrical. There are no large gaps in the distribution. There are 639 outliers on the low end, the lowest being 247,661 coins and 341 outliers on the high end, the highest being 8,553,930,847 coins.

Price and cost distributions (outliers omitted)



Price and cost distributions (outliers included)



Key:

Sell Price

Material Cost

5 number summeries (thousands of coins):

min: 134, q1: 272, median: 730, q3: 805, max: 900

min: 372, q1: 398, median: 407, q3: 415, max: 443

Statistical test comparing the selling prices and material costs of a <u>beacon i</u>

Let group1 = Sell prices of a beacon i, group2 = Material cost of a beacon i

X_1 = Sell price of a beacon i (coins), X_2 = Material cost of a beacon i (coins)

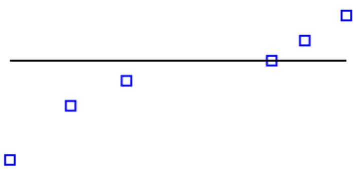
μ_1 = Mean sell price of a beacon i (coins), μ_2 = Mean material cost of a beacon i (coins)

H_o: $\mu_1 = \mu_2$ H_a: $\mu_1 > \mu_2$

<u>Requirements for a difference of means test (σ_1 and σ_2 unknown):</u>

1. 2 independent SRS's: ✓ $n_1 = 6$ $n_2 = 6508$
   One price/cost from either group will not affect any price/cost from either group
2. σ is not known, but S_x is: ✓ S_1 = 313,856.6251 coins S_2 = 13,545.8404 coins
3. Group1 is normally distributed and $n_2 > 30$: ✓

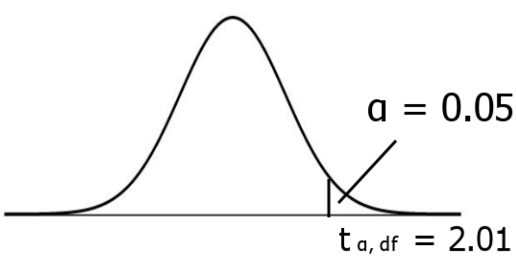
Quantile plot of sell prices



$n_2 = 6508 > 30$

<u>Rejection Critieria:</u>

$\alpha = 0.05$ df = 5



Reject H_o if $t > 2.01$

<u>Test Statistic:</u>

$$t = \frac{(\bar{x}_1 - \bar{x}_2) - (\mu_1 - \mu_2)}{\sqrt{\frac{S_1^2}{N_1} + \frac{S_2^2}{N_2}}}$$

$t = 1.05$

p-value = 0.1719

Fail to reject H_o since $1.05 < 2.01$

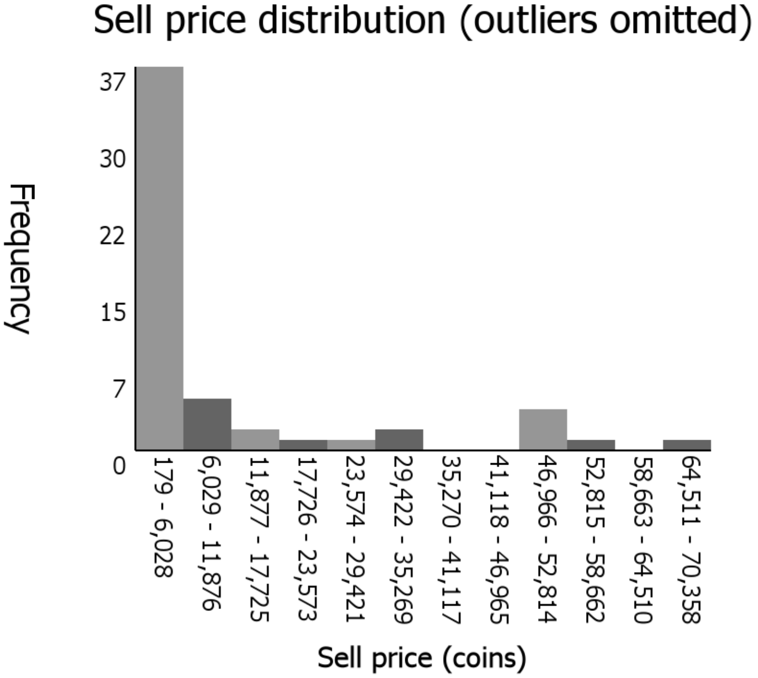
Inputs:

$\bar{x}_1$ = 540,100.6667 (coins)
$\bar{x}_2$ = 406,167.9263 (coins)
S_1 = 313,856.6251 (coins)
S_2 = 13,545.8404 (coins)
$n_1 = 6$
n_2 = 6,508

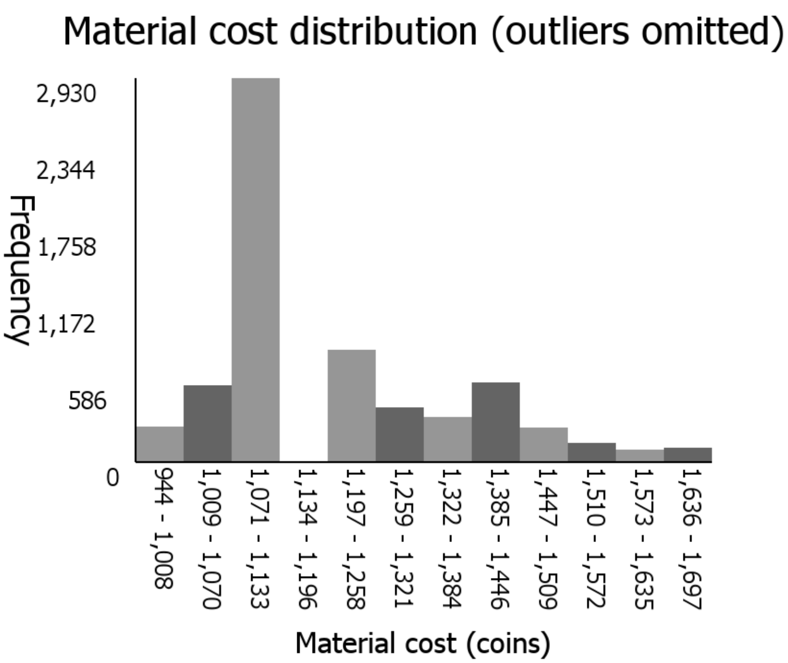
There is not significant evidence at the α=0.05 level of significance to support the claim that the mean selling price of a beacon i is greater than the mean cost of the materials required to make it.

Since we failed to reject H_o, it suggests that on average people did not earn more coins from selling this item than it would have cost them to buy the materials.

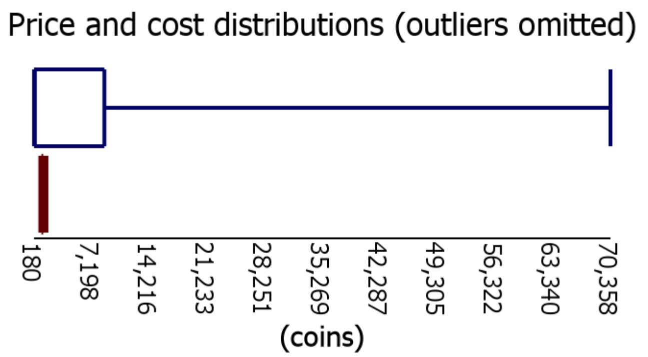
Selling prices and material costs of a sea creature talisman

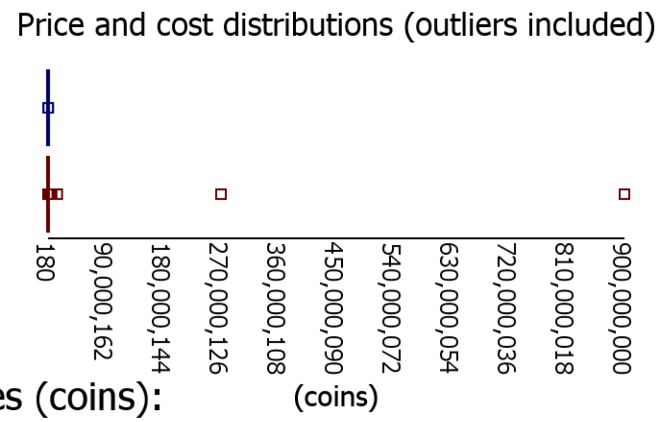


The distribution is centered around 288 coins (median). It has a high variability (IQR of 8,566 coins) and is skewed right. There are large gaps between 35,269 - 46,965 coins and 58,662 - 64,510 coins. There are 0 outliers on the low end and 8 outliers on the high end, the highest being 459,499 coins.



The distribution is centered around 1,106 coins (median). It has a low variability (IQR of 218 coins) and is skewed right. There are no large gaps in the distribution. There are 0 outliers on the low end and 847 outliers on the high end, the highest being 900,000,000 coins.





Key:

Sell Price

Material Cost

5 number summeries (coins):

min: 180, q1: 180, median: 288, q3: 8,746, max: 70,358

min: 945, q1: 1,080, median: 1,106, q3: 1,298, max: 1,697

Statistical test comparing the selling prices and material costs of a sea creature talisman

Let group1 = Sell prices of a sea creature talisman, group2 = Material cost of a sea creature talisman
X_1 = Sell price of a sea creature talisman (coins), X_2 = Material cost of a sea creature talisman (coins)
μ_1 = Mean sell price of a sea creature talisman (coins), μ_2 = Mean material cost of a sea creature talisman (coins)

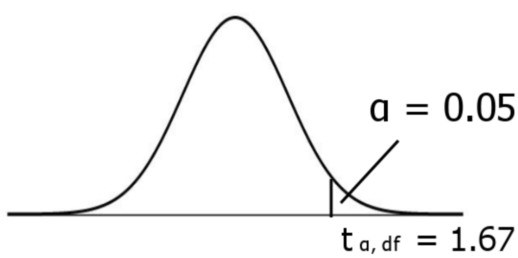
H_o: $\mu_1 = \mu_2$ H_a: $\mu_1 > \mu_2$

Requirements for a difference of means test (σ_1 and σ_2 unknown):

1. 2 independent SRS's: ✓ $n_1 = 54$ $n_2 = 6641$
   One price/cost from either group will not affect any price/cost from either group
2. σ is not known, but S_x is: ✓ $S_1 = 17{,}941.9384$ coins $S_2 = 168.2364$ coins
3. $n_1 > 30$ and $n_2 > 30$: ✓ $n_1 = 54 > 30$ $n_2 = 6641 > 30$

Rejection Critieria:

$\alpha = 0.05$ df = 53



Reject H_o if $t > 1.67$

Test Statistic:

$$t = \frac{(\bar{x}_1 - \bar{x}_2) - (\mu_1 - \mu_2)}{\sqrt{\frac{S_1^2}{N_1} + \frac{S_2^2}{N_2}}}$$

$t = 3.59$
p-value = 0.0004

Reject H_o since $3.59 > 1.67$

Inputs:

$\bar{x}_1 = 9{,}966.2407$ (coins)
$\bar{x}_2 = 1{,}199.7669$ (coins)
$S_1 = 17{,}941.9384$ (coins)
$S_2 = 168.2364$ (coins)
$n_1 = 54$
$n_2 = 6{,}641$

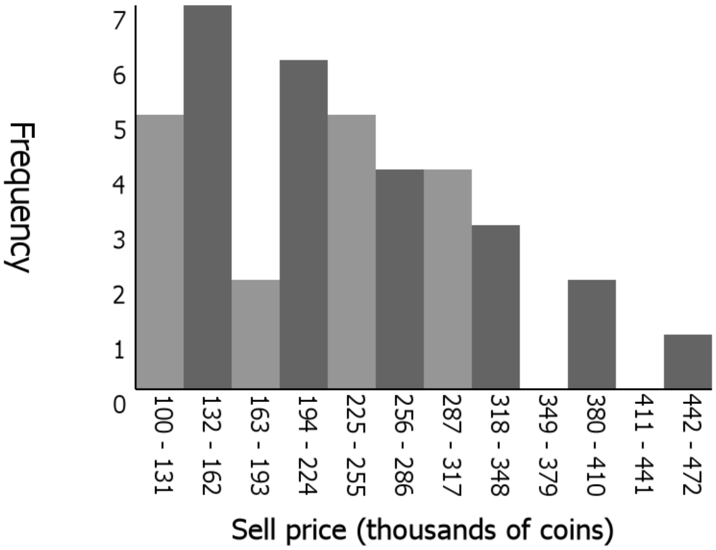
There is significant evidence at the α=0.05 level of significance to support the claim that the mean selling price of a sea creature talisman is greater than the mean cost of the materials required to make it.

Since we rejected H_o, it suggests that on average people earned more coins from selling this item than it would have cost them to buy the materials.

Implication: the test suggests that on average we could make a profit from flipping this item.

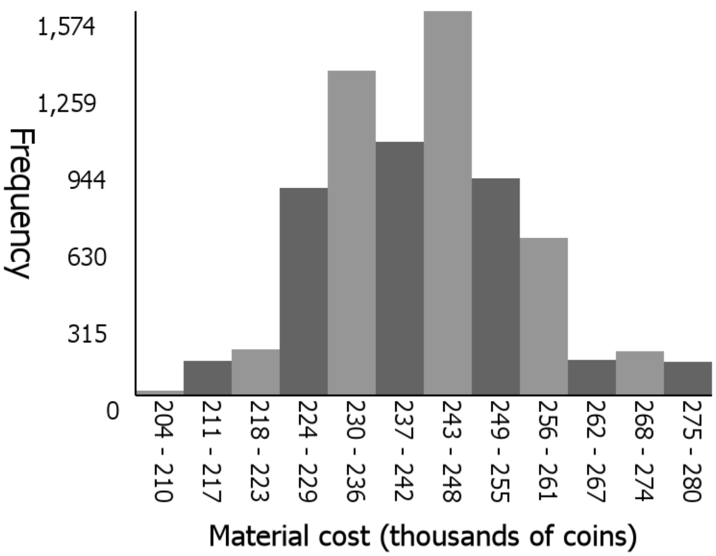
Selling prices and material costs of a young dragon boots

Sell price distribution (outliers omitted)



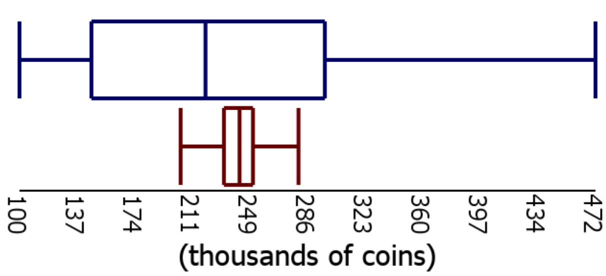
The distribution is centered around 220,000 coins (median). It has a low variability (IQR of 150,590 coins) and is mostly symmetrical. There are large gaps between 347,726 - 378,692 coins and 409,658 - 440,623 coins. There are 0 outliers on the low end and 0 outliers on the high end.

Material cost distribution (outliers omitted)

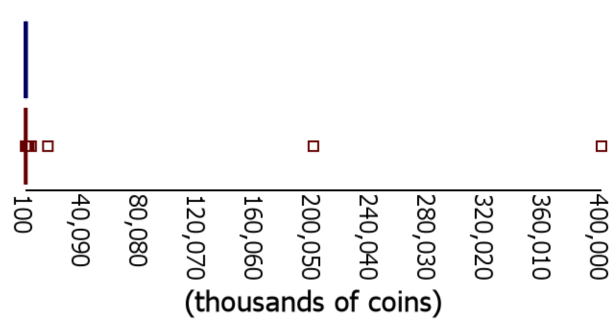


The distribution is centered around 241,976 coins (median). It has a low variability (IQR of 18,740 coins) and is mostly symmetrical. There are no large gaps in the distribution. There are 3 outliers on the low end, the lowest being 203,367 coins and 345 outliers on the high end, the highest being 399,999,948 coins.

Price and cost distributions (outliers omitted)



Price and cost distributions (outliers included)



Key:

Sell Price

Material Cost

5 number summeries (thousands of coins):

min: 100, q1: 146, median: 220, q3: 297, max: 472

min: 204, q1: 232, median: 242, q3: 251, max: 280

Statistical test comparing the selling prices and material costs of a young dragon boots

Let group1 = Sell prices of a young dragon boots, group2 = Material cost of a young dragon boots
X_1 = Sell price of a young dragon boots (coins), X_2 = Material cost of a young dragon boots (coins)
μ_1 = Mean sell price of a young dragon boots (coins), μ_2 = Mean material cost of a young dragon boots (coins)

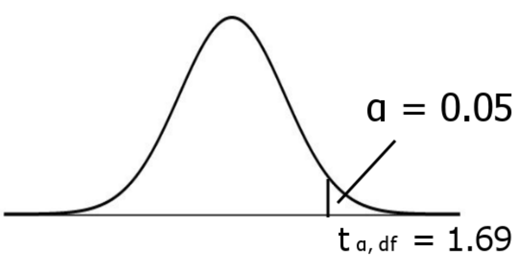
H_o: $\mu_1 = \mu_2$ H_a: $\mu_1 > \mu_2$

Requirements for a difference of means test (σ_1 and σ_2 unknown):

1. 2 independent SRS's: ✓ $n_1 = 39$ $n_2 = 7140$
   One price/cost from either group will not affect any price/cost from either group
2. σ is not known, but S_x is: ✓ $S_1 = 88,438.2783$ coins $S_2 = 12,941.3002$ coins
3. $n_1 > 30$ and $n_2 > 30$: ✓ $n_1 = 39 > 30$ $n_2 = 7140 > 30$

Rejection Critieria:

$\alpha = 0.05$ df = 38



Reject H_o if $t > 1.69$

Test Statistic:

$$t = \frac{(\bar{x}_1 - \bar{x}_2) - (\mu_1 - \mu_2)}{\sqrt{\frac{S_1^2}{N_1} + \frac{S_2^2}{N_2}}}$$

$t = -0.92$
p-value = 0.8170

Fail to reject H_o since $-0.92 < 1.69$

Inputs:

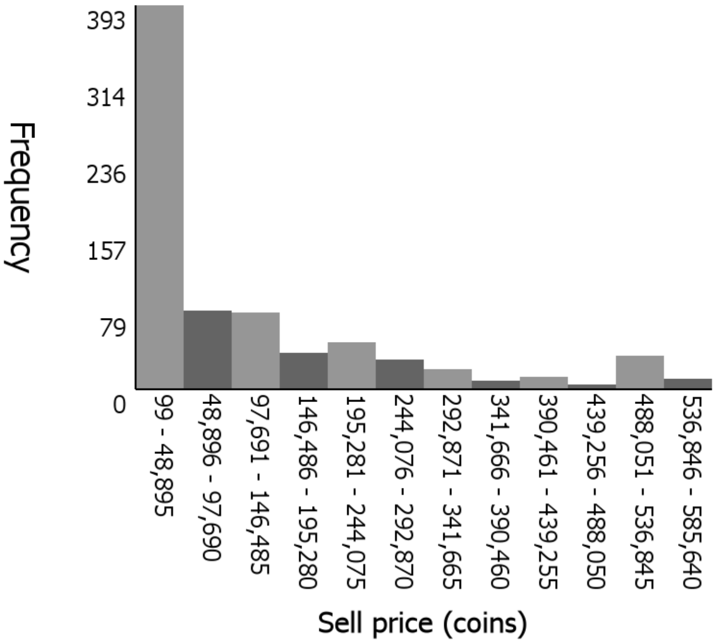
$\bar{x}_1 = 229,015.4872$ (coins)
$\bar{x}_2 = 241,974.9729$ (coins)
$S_1 = 88,438.2783$ (coins)
$S_2 = 12,941.3002$ (coins)
$n_1 = 39$
$n_2 = 7,140$

There is not significant evidence at the α=0.05 level of significance to support the claim that the mean selling price of a young dragon boots is greater than the mean cost of the materials required to make it.

Since we failed to reject H_o, it suggests that on average people did not earn more coins from selling this item than it would have cost them to buy the materials.

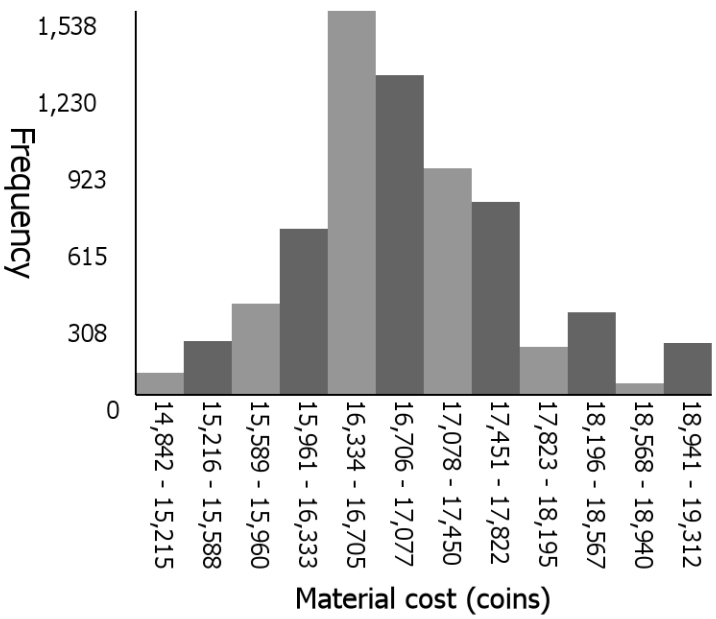
Selling prices and material costs of a lava talisman

Sell price distribution (outliers omitted)



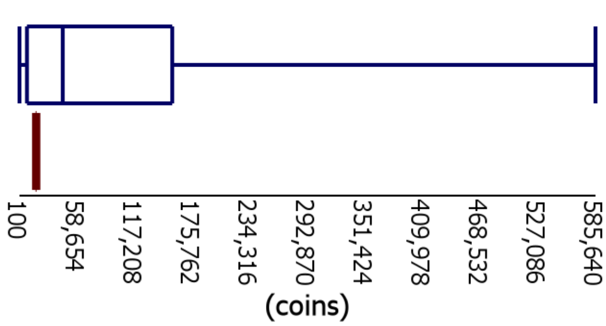
The distribution is centered around 44,083 coins (median). It has a high variability (IQR of 147,728 coins) and is skewed right. There are no large gaps in the distribution. There are 0 outliers on the low end and 86 outliers on the high end, the highest being 11,494,047 coins.

Material cost distribution (outliers omitted)

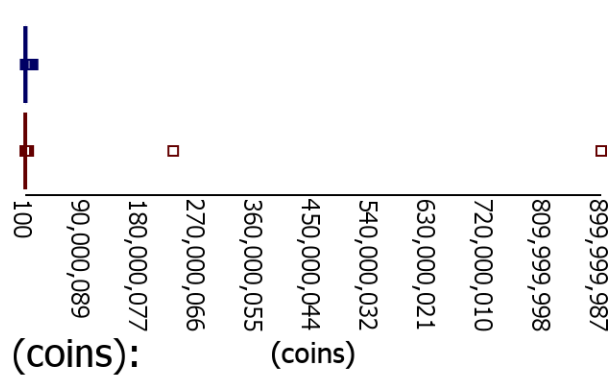


The distribution is centered around 17,002 coins (median). It has a low variability (IQR of 930 coins) and is mostly symmetrical. There are no large gaps in the distribution. There are 120 outliers on the low end, the lowest being 12,215 coins and 761 outliers on the high end, the highest being 899,999,987 coins.

Price and cost distributions (outliers omitted)



Price and cost distributions (outliers included)



Key:

Sell Price

Material Cost

5 number summeries (coins):

min: 100, q1: 7,671, median: 44,083, q3: 155,399, max: 585,640

min: 14,843, q1: 16,455, median: 17,002, q3: 17,385, max: 19,312

Statistical test comparing the selling prices and material costs of a lava talisman

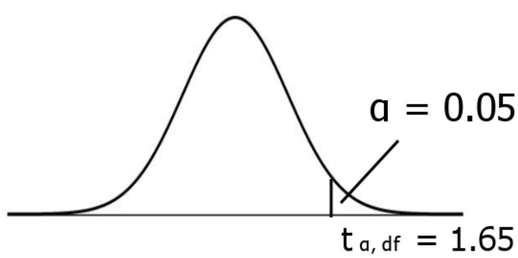
Let group1 = Sell prices of a lava talisman, group2 = Material cost of a lava talisman
X_1 = Sell price of a lava talisman (coins), X_2 = Material cost of a lava talisman (coins)
μ_1 = Mean sell price of a lava talisman (coins), μ_2 = Mean material cost of a lava talisman (coins)

H_o: $\mu_1 = \mu_2$ H_a: $\mu_1 > \mu_2$

Requirements for a difference of means test (σ_1 and σ_2 unknown):

1. 2 independent SRS's: ✓ $n_1 = 761$ $n_2 = 6607$
   One price/cost from either group will not affect any price/cost from either group
2. σ is not known, but S_X is: ✓ S_1 = 144,906.9991 coins S_2 = 807.6002 coins
3. $n_1 > 30$ and $n_2 > 30$: ✓ $n_1 = 761 > 30$ $n_2 = 6607 > 30$

Rejection Critieria:
$\alpha = 0.05$ df = 760



Reject H_o if $t > 1.65$

Test Statistic:

$$t = \frac{(\bar{x}_1 - \bar{x}_2) - (\mu_1 - \mu_2)}{\sqrt{\frac{S_1^2}{N_1} + \frac{S_2^2}{N_2}}}$$

$t = 17.84$
p-value < 0.0001

Reject H_o since $17.84 > 1.65$

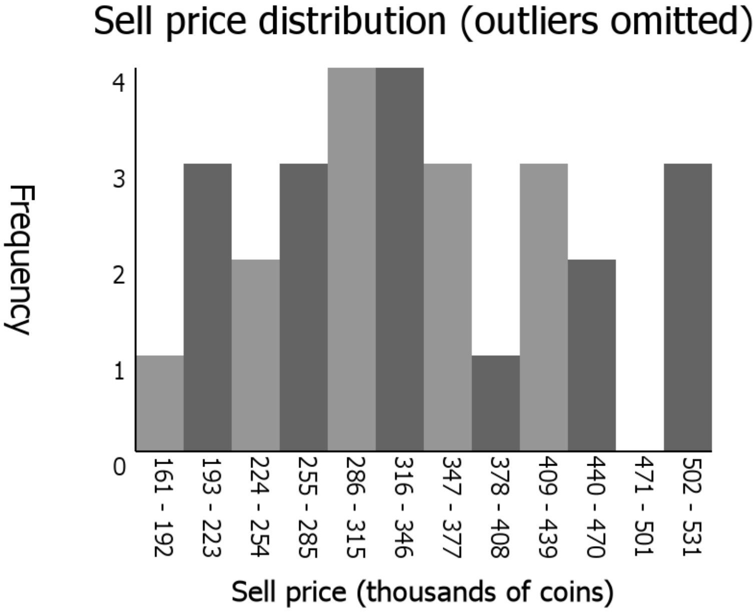
Inputs:
$\bar{x}_1$ = 110,636.5992 (coins)
$\bar{x}_2$ = 16,934.8636 (coins)
S_1 = 144,906.9991 (coins)
S_2 = 807.6002 (coins)
n_1 = 761
n_2 = 6,607

There is significant evidence at the α=0.05 level of significance to support the claim that the mean selling price of a lava talisman is greater than the mean cost of the materials required to make it.

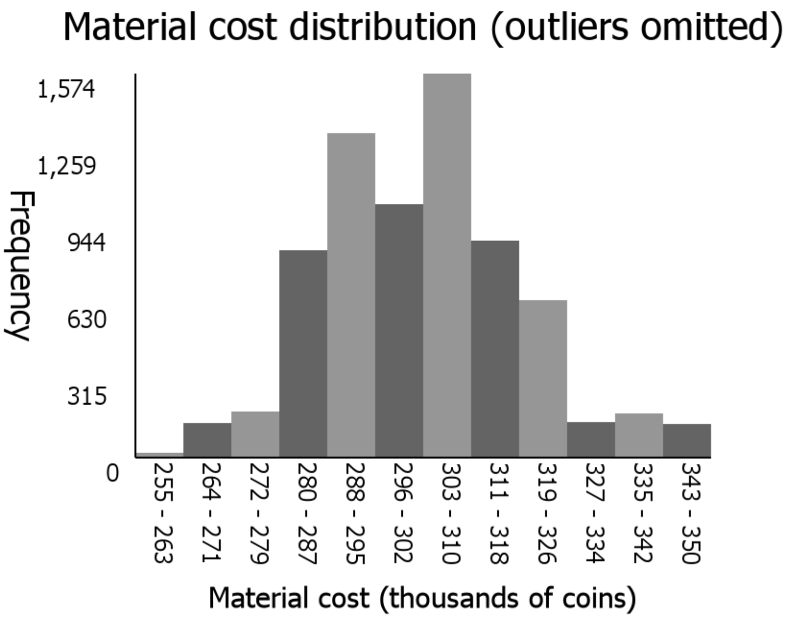
Since we rejected H_o, it suggests that on average people earned more coins from selling this item than it would have cost them to buy the materials.

Implication: the test suggests that on average we could make a profit from flipping this item.

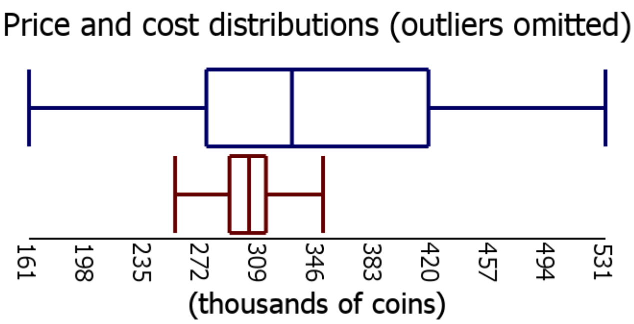
Selling prices and material costs of a young dragon helmet

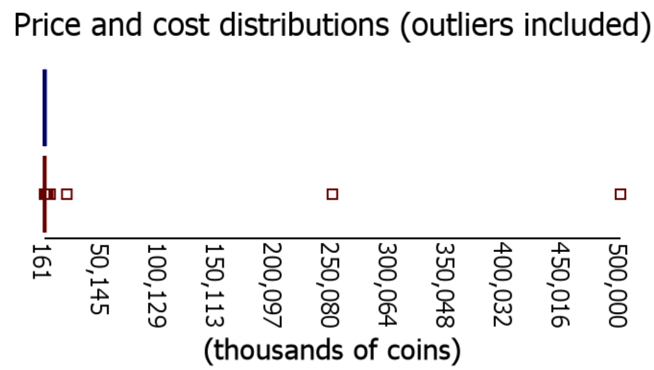


The distribution is centered around 330,000 coins (median). It has a low variability (IQR of 142,726 coins) and is mostly symmetrical. There is a large gap between 469,732 - 500,600 coins. There are 0 outliers on the low end and 0 outliers on the high end.



The distribution is centered around 302,470 coins (median). It has a low variability (IQR of 23,425 coins) and is mostly symmetrical. There are no large gaps in the distribution. There are 3 outliers on the low end, the lowest being 254,209 coins and 345 outliers on the high end, the highest being 499,999,935 coins.





Key:

Sell Price

Material Cost

5 number summeries (thousands of coins):

min: 161, q1: 275, median: 330, q3: 418, max: 531

min: 255, q1: 290, median: 302, q3: 313, max: 350

Statistical test comparing the selling prices and material costs of a young dragon helmet

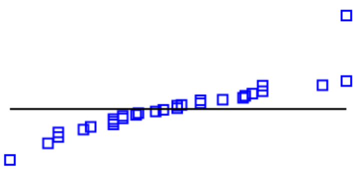
Let group1 = Sell prices of a young dragon helmet, group2 = Material cost of a young dragon helmet
X_1 = Sell price of a young dragon helmet (coins), X_2 = Material cost of a young dragon helmet (coins)
μ_1 = Mean sell price of a young dragon helmet (coins), μ_2 = Mean material cost of a young dragon helmet (coins)

H_o: $\mu_1 = \mu_2$ H_a: $\mu_1 > \mu_2$

Requirements for a difference of means test (σ_1 and σ_2 unknown):

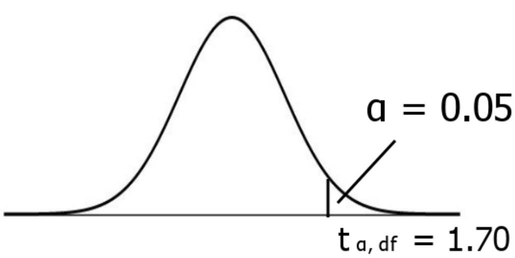
1. 2 independent SRS's: ✓ $n_1 = 29$ $n_2 = 7140$
   One price/cost from either group will not affect any price/cost from either group
2. σ is not known, but S_x is: ✓ S_1 = 97,787.8274 coins S_2 = 16,176.6243 coins
3. Group1 is normally distributed and $n_2 > 30$: ✓

Quantile plot of sell prices



$n_2 = 7140 > 30$

Rejection Critieria:
$\alpha = 0.05$ df = 28



Reject H_o if $t > 1.70$

Test Statistic:

$$t = \frac{(\bar{x}_1 - \bar{x}_2) - (\mu_1 - \mu_2)}{\sqrt{\frac{S_1^2}{N_1} + \frac{S_2^2}{N_2}}}$$

Inputs:
$\bar{x}_1$ = 338,770.5172 (coins)
$\bar{x}_2$ = 302,468.7337 (coins)
S_1 = 97,787.8274 (coins)
S_2 = 16,176.6243 (coins)
$n_1 = 29$
n_2 = 7,140

$t = 2.00$
p-value = 0.0277

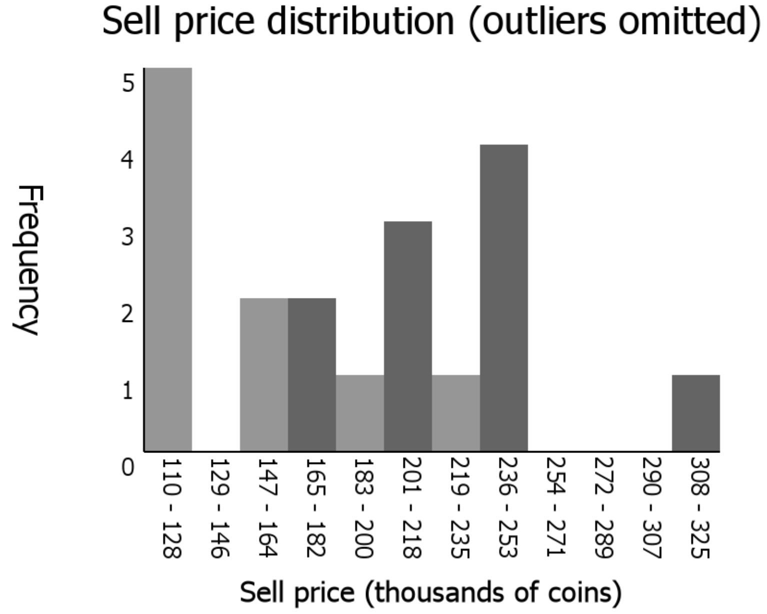
Reject H_o since $2.00 > 1.70$

There is significant evidence at the α=0.05 level of significance to support the claim that the mean selling price of a young dragon helmet is greater than the mean cost of the materials required to make it.

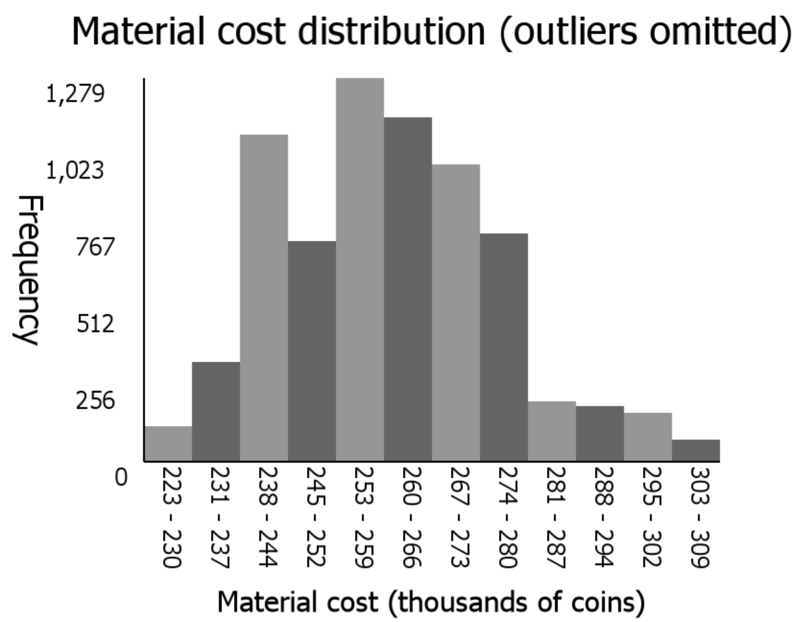
Since we rejected H_o, it suggests that on average people earned more coins from selling this item than it would have cost them to buy the materials.

Implication: the test suggests that on average we could make a profit from flipping this item.

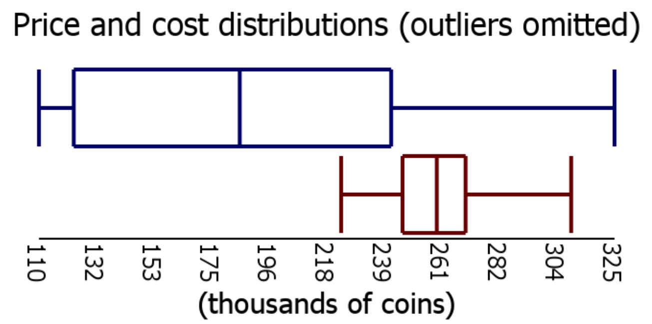
Selling prices and material costs of a holy dragon boots

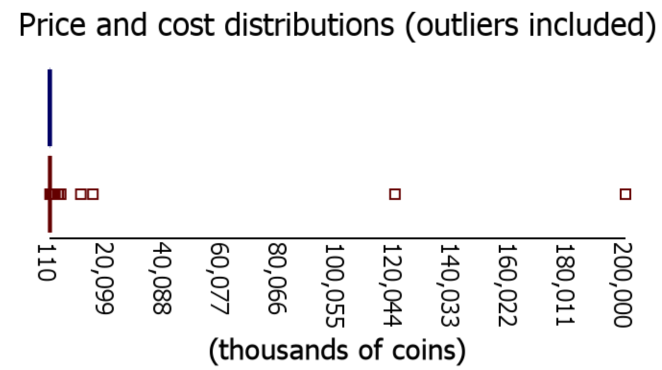


The distribution is centered around 185,000 coins (median). It has a low variability (IQR of 118,577 coins) and is mostly symmetrical. There are large gaps between 127,917 - 145,833 coins and 253,333 - 307,083 coins. There are 0 outliers on the low end and 0 outliers on the high end.



The distribution is centered around 258,602 coins (median). It has a low variability (IQR of 23,550 coins) and is mostly symmetrical. There are no large gaps in the distribution. There are 0 outliers on the low end and 404 outliers on the high end, the highest being 200,000,000 coins.





Key:

Sell Price

Material Cost

5 number summeries (thousands of coins):

min: 110, q1: 123, median: 185, q3: 242, max: 325

min: 223, q1: 246, median: 259, q3: 269, max: 309

Statistical test comparing the selling prices and material costs of a holy dragon boots

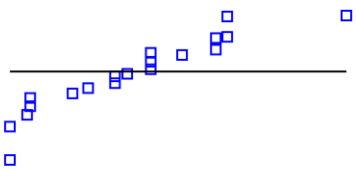
Let group1 = Sell prices of a holy dragon boots, group2 = Material cost of a holy dragon boots
X_1 = Sell price of a holy dragon boots (coins), X_2 = Material cost of a holy dragon boots (coins)
μ_1 = Mean sell price of a holy dragon boots (coins), μ_2 = Mean material cost of a holy dragon boots (coins)

H_o: $\mu_1 = \mu_2$ H_a: $\mu_1 > \mu_2$

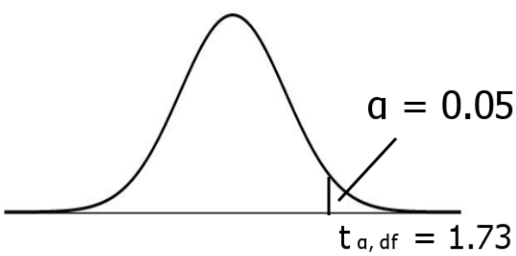
Requirements for a difference of means test (σ_1 and σ_2 unknown):

1. 2 independent SRS's: ✓ $n_1 = 19$ $n_2 = 7084$
   One price/cost from either group will not affect any price/cost from either group
2. σ is not known, but S_x is: ✓ S_1 = 58,193.676 coins S_2 = 16,133.3356 coins
3. Group1 is normally distributed and $n_2 > 30$: ✓

Quantile plot of sell prices $n_2 = 7084 > 30$



Rejection Critieria:
$\alpha = 0.05$ df = 18



Reject H_o if $t > 1.73$

Test Statistic:

$$t = \frac{(\bar{x}_1 - \bar{x}_2) - (\mu_1 - \mu_2)}{\sqrt{\frac{S_1^2}{N_1} + \frac{S_2^2}{N_2}}}$$

$t = -5.38$
p-value > 0.9999

Inputs:
$\bar{x}_1$ = 187,487.3684 (coins)
$\bar{x}_2$ = 259,372.2111 (coins)
S_1 = 58,193.676 (coins)
S_2 = 16,133.3356 (coins)
$n_1 = 19$
n_2 = 7,084

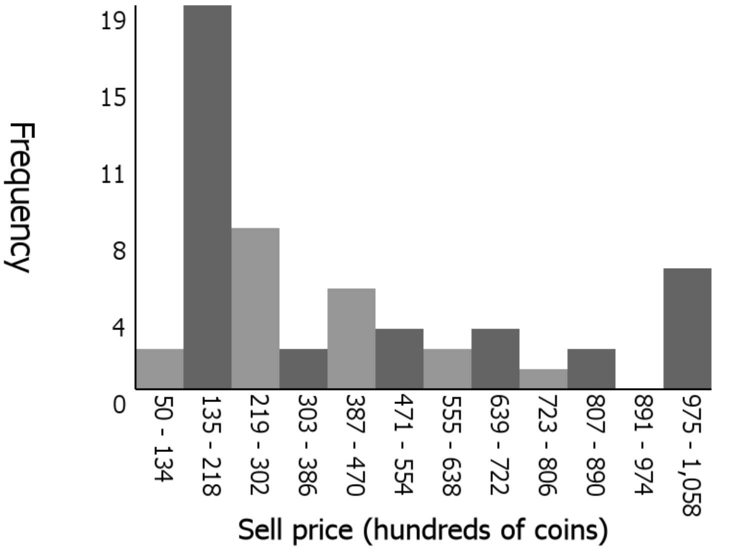
Fail to reject H_o since $-5.38 < 1.73$

There is not significant evidence at the α=0.05 level of significance to support the claim that the mean selling price of a holy dragon boots is greater than the mean cost of the materials required to make it.

Since we failed to reject H_o, it suggests that on average people did not earn more coins from selling this item than it would have cost them to buy the materials.

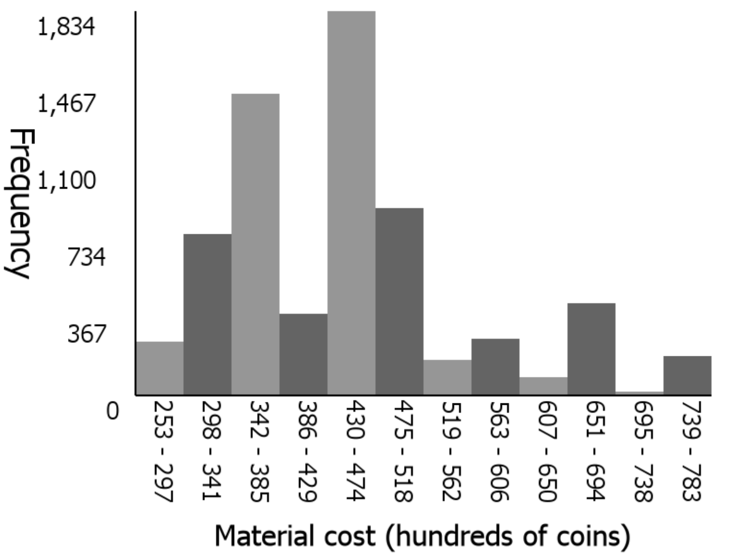
Selling prices and material costs of a fel sword

Sell price distribution (outliers omitted)



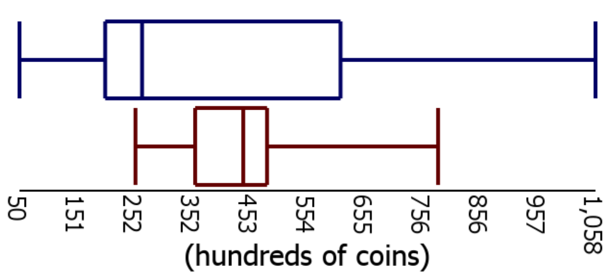
The distribution is centered around 26,450 coins (median). It has a low variability (IQR of 41,181 coins) and is skewed right. There is a large gap between 89,000 - 97,400 coins. There are 0 outliers on the low end and 6 outliers on the high end, the highest being 50,000,000 coins.

Material cost distribution (outliers omitted)

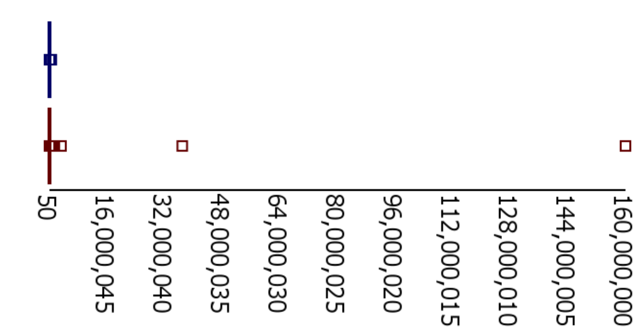


The distribution is centered around 44,160 coins (median). It has a low variability (IQR of 12,577 coins) and is mostly symmetrical. There are no large gaps in the distribution. There are 0 outliers on the low end and 722 outliers on the high end, the highest being 16,000,000,000 coins.

Price and cost distributions (outliers omitted)



Price and cost distributions (outliers included)



Key:

Sell Price

Material Cost

5 number summeries (hundreds of coins):

min: 50, q1: 200, median: 265, q3: 612, max: 1,058

min: 253, q1: 357, median: 442, q3: 483, max: 783

Statistical test comparing the selling prices and material costs of a fel sword

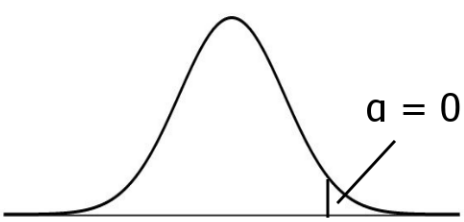
Let group1 = Sell prices of a fel sword, group2 = Material cost of a fel sword
X_1 = Sell price of a fel sword (coins), X_2 = Material cost of a fel sword (coins)
μ_1 = Mean sell price of a fel sword (coins), μ_2 = Mean material cost of a fel sword (coins)

H_o: $\mu_1 = \mu_2$ H_a: $\mu_1 > \mu_2$

Requirements for a difference of means test (σ_1 and σ_2 unknown):

1. 2 independent SRS's: ✓ $n_1 = 53$ $n_2 = 6766$
   One price/cost from either group will not affect any price/cost from either group
2. σ is not known, but S_x is: ✓ S_1 = 29,033.3936 coins S_2 = 11,069.3684 coins
3. $n_1 > 30$ and $n_2 > 30$: ✓ $n_1 = 53 > 30$ $n_2 = 6766 > 30$

Rejection Critieria:
$\alpha = 0.05$ df = 52



Reject H_o if $t > 1.67$

Test Statistic:

$$t = \frac{(\bar{x}_1 - \bar{x}_2) - (\mu_1 - \mu_2)}{\sqrt{\frac{S_1^2}{N_1} + \frac{S_2^2}{N_2}}}$$

Inputs:
$\bar{x}_1$ = 42,011.1321 (coins)
$\bar{x}_2$ = 44,908.5747 (coins)
S_1 = 29,033.3936 (coins)
S_2 = 11,069.3684 (coins)
n_1 = 53
n_2 = 6,766

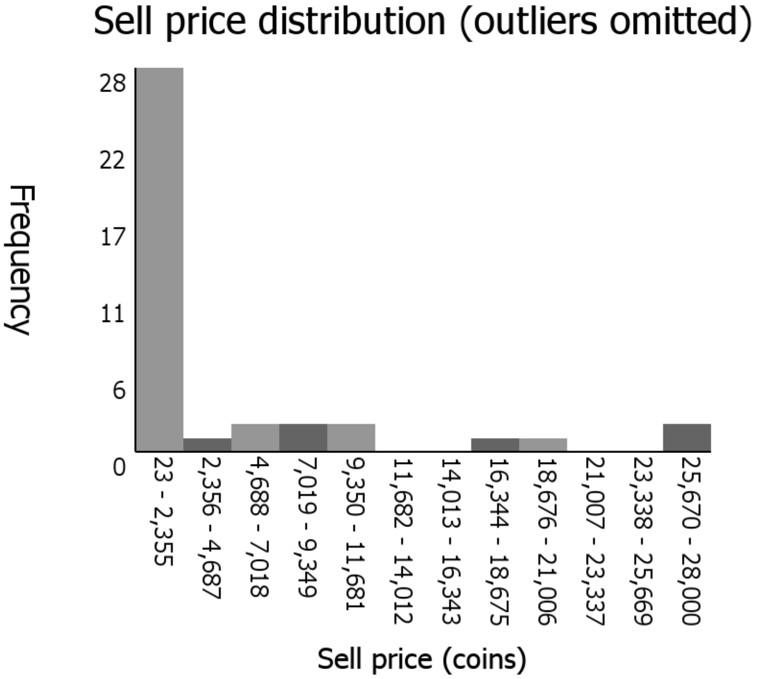
$t = -0.73$
p-value = 0.7645

Fail to reject H_o since $-0.73 < 1.67$

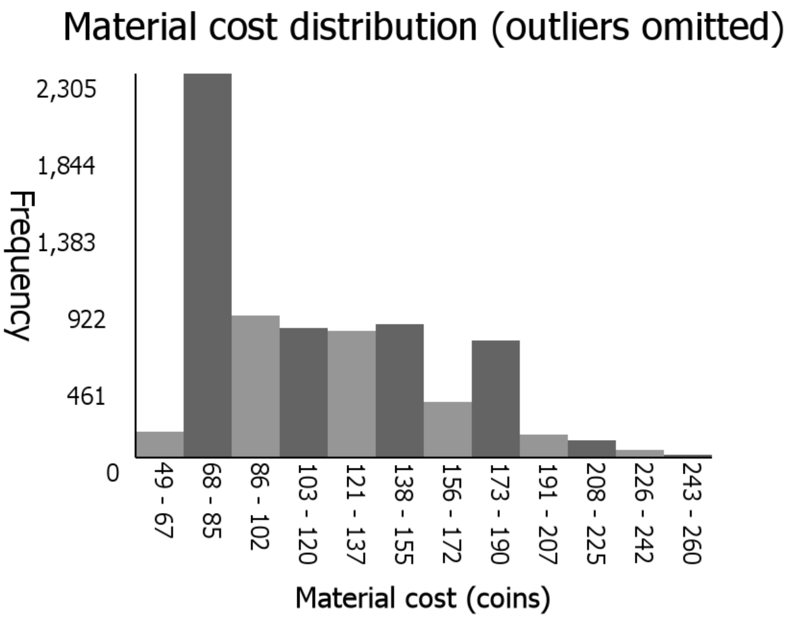
There is not significant evidence at the α=0.05 level of significance to support the claim that the mean selling price of a fel sword is greater than the mean cost of the materials required to make it.

Since we failed to reject H_o, it suggests that on average people did not earn more coins from selling this item than it would have cost them to buy the materials.

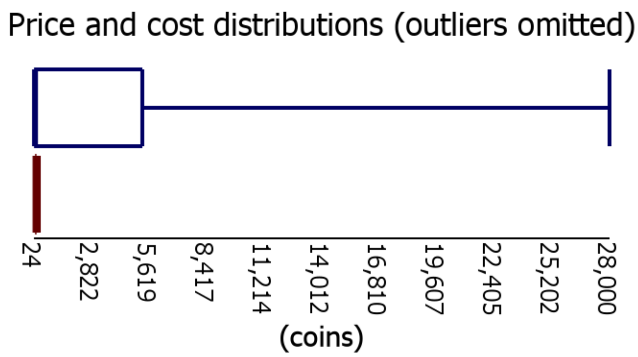
Selling prices and material costs of an angler chestplate

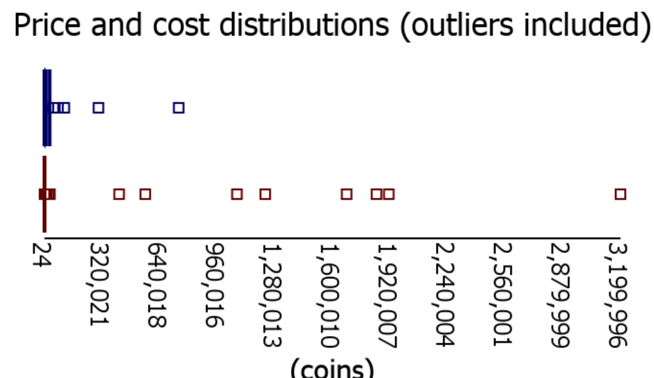


The distribution is centered around 125 coins (median). It has a high variability (IQR of 5,262 coins) and is skewed right. There are large gaps between 11,681 - 16,343 coins and 21,006 - 25,669 coins. There are 0 outliers on the low end and 10 outliers on the high end, the highest being 745,425 coins.



The distribution is centered around 106 coins (median). It has a low variability (IQR of 69 coins) and is skewed right. There are no large gaps in the distribution. There are 0 outliers on the low end and 491 outliers on the high end, the highest being 3,199,996 coins.





Key:

Sell Price

Material Cost

5 number summeries (coins):

min: 24, q1: 28, median: 125, q3: 5,290, max: 28,000

min: 50, q1: 78, median: 106, q3: 147, max: 260

Statistical test comparing the selling prices and material costs of an <u>angler chestplate</u>

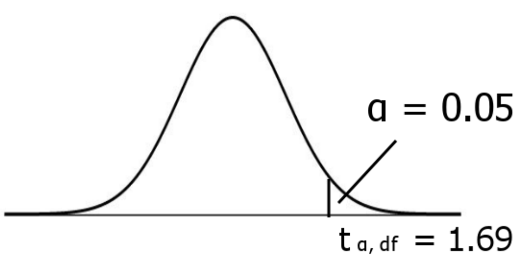
Let group1 = Sell prices of an angler chestplate, group2 = Material cost of an angler chestplate
X_1 = Sell price of an angler chestplate (coins), X_2 = Material cost of an angler chestplate (coins)
μ_1 = Mean sell price of an angler chestplate (coins), μ_2 = Mean material cost of an angler chestplate (coins)

H_o: $\mu_1 = \mu_2$ H_a: $\mu_1 > \mu_2$

<u>Requirements for a difference of means test (σ_1 and σ_2 unknown):</u>

1. 2 independent SRS's: ✓ $n_1 = 39$ $n_2 = 6997$
   One price/cost from either group will not affect any price/cost from either group
2. σ is not known, but S_x is: ✓ S_1 = 7,499.6147 coins S_2 = 41.7451 coins
3. $n_1 > 30$ and $n_2 > 30$: ✓ $n_1 = 39 > 30$ $n_2 = 6997 > 30$

<u>Rejection Critieria:</u>
$\alpha = 0.05$ df = 38



Reject H_o if $t > 1.69$

<u>Test Statistic:</u>

$$t = \frac{(\bar{x}_1 - \bar{x}_2) - (\mu_1 - \mu_2)}{\sqrt{\frac{S_1^2}{N_1} + \frac{S_2^2}{N_2}}}$$

Inputs:
$\bar{x}_1$ = 3,971.641 (coins)
$\bar{x}_2$ = 116.3167 (coins)
S_1 = 7,499.6147 (coins)
S_2 = 41.7451 (coins)
n_1 = 39
n_2 = 6,997

$t = 3.21$
p-value = 0.0013

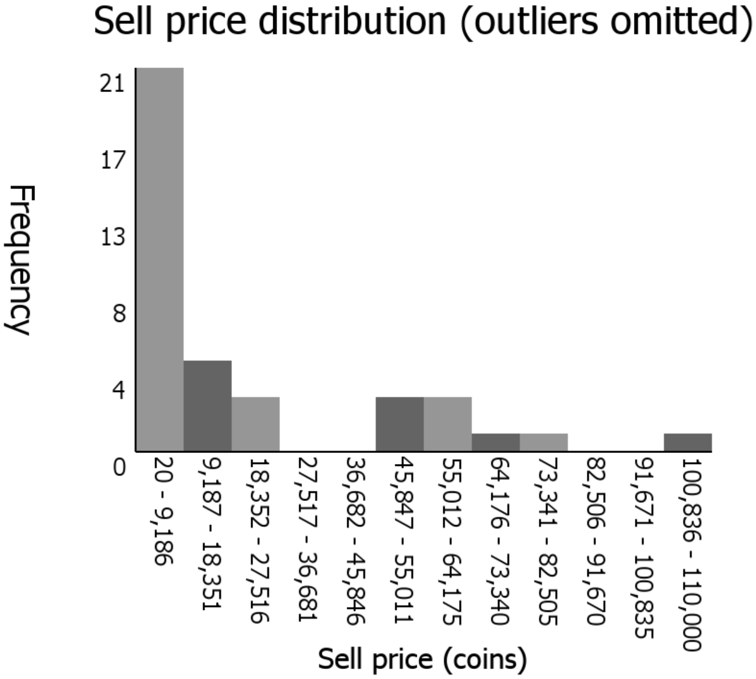
Reject H_o since $3.21 > 1.69$

There is significant evidence at the α=0.05 level of significance to support the claim that the mean selling price of an angler chestplate is greater than the mean cost of the materials required to make it.

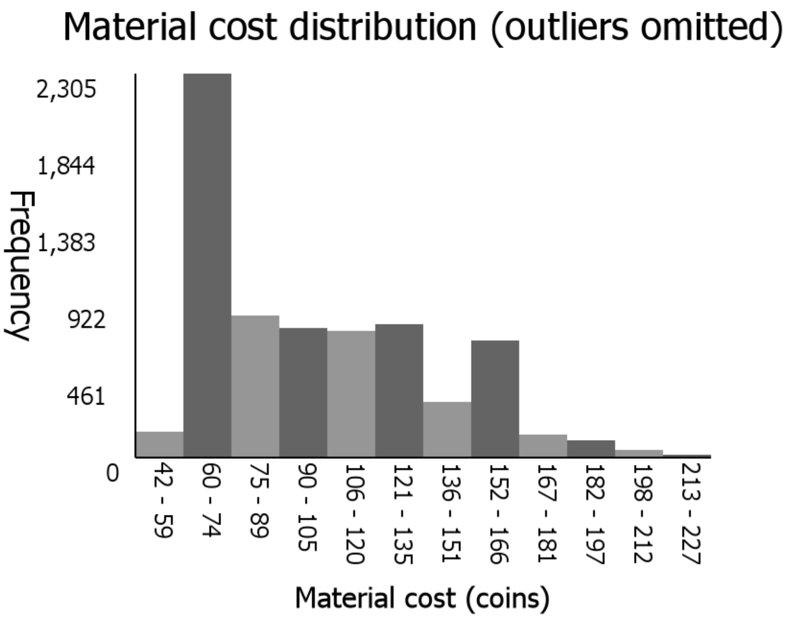
Since we rejected H_o, it suggests that on average people earned more coins from selling this item than it would have cost them to buy the materials.

Implication: the test suggests that on average we could make a profit from flipping this item.

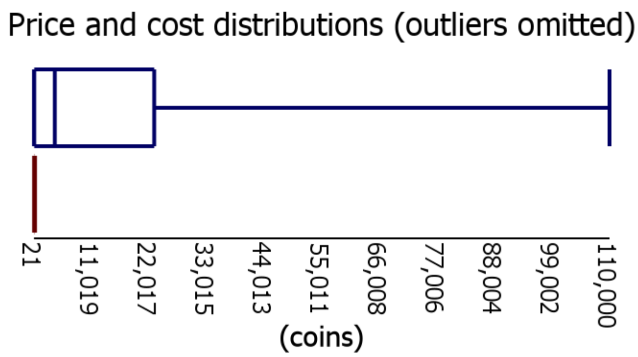
Selling prices and material costs of an angler leggings

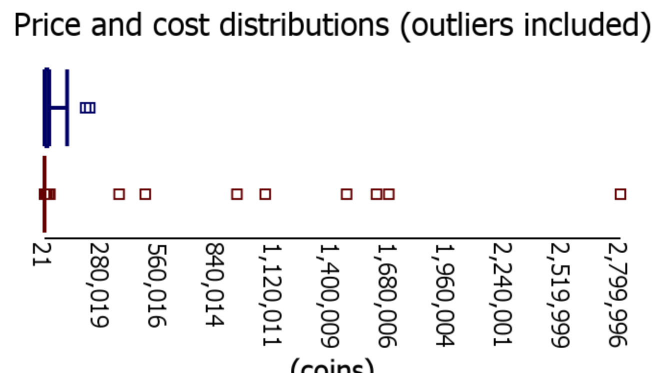


The distribution is centered around 4,000 coins (median). It has a high variability (IQR of 22,921 coins) and is skewed right. There are large gaps between 27,516 - 45,846 coins and 82,505 - 100,835 coins. There are 0 outliers on the low end and 3 outliers on the high end, the highest being 220,000 coins.



The distribution is centered around 93 coins (median). It has a low variability (IQR of 61 coins) and is skewed right. There are no large gaps in the distribution. There are 0 outliers on the low end and 491 outliers on the high end, the highest being 2,799,996 coins.





Key:

Sell Price

Material Cost

5 number summeries (coins):

min: 21, q1: 79, median: 4,000, q3: 23,000, max: 110,000

min: 43, q1: 68, median: 93, q3: 129, max: 227

Statistical test comparing the selling prices and material costs of an angler leggings

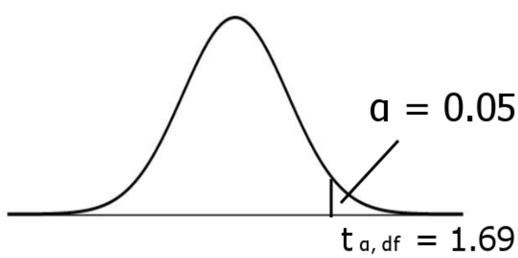
Let group1 = Sell prices of an angler leggings, group2 = Material cost of an angler leggings
X_1 = Sell price of an angler leggings (coins), X_2 = Material cost of an angler leggings (coins)
μ_1 = Mean sell price of an angler leggings (coins), μ_2 = Mean material cost of an angler leggings (coins)

H_o: $\mu_1 = \mu_2$ H_a: $\mu_1 > \mu_2$

Requirements for a difference of means test (σ_1 and σ_2 unknown):

1. 2 independent SRS's: ✓ $n_1 = 38$ $n_2 = 6997$
   One price/cost from either group will not affect any price/cost from either group
2. σ is not known, but S_x is: ✓ $S_1 = 28{,}121.6435$ coins $S_2 = 36.5273$ coins
3. $n_1 > 30$ and $n_2 > 30$: ✓ $n_1 = 38 > 30$ $n_2 = 6997 > 30$

Rejection Critieria:
$\alpha = 0.05$ df = 37



Reject H_o if $t > 1.69$

Test Statistic:

$$t = \frac{(\bar{x}_1 - \bar{x}_2) - (\mu_1 - \mu_2)}{\sqrt{\frac{S_1^2}{N_1} + \frac{S_2^2}{N_2}}}$$

$t = 4.15$
p-value = 0.0001

Reject H_o since $4.15 > 1.69$

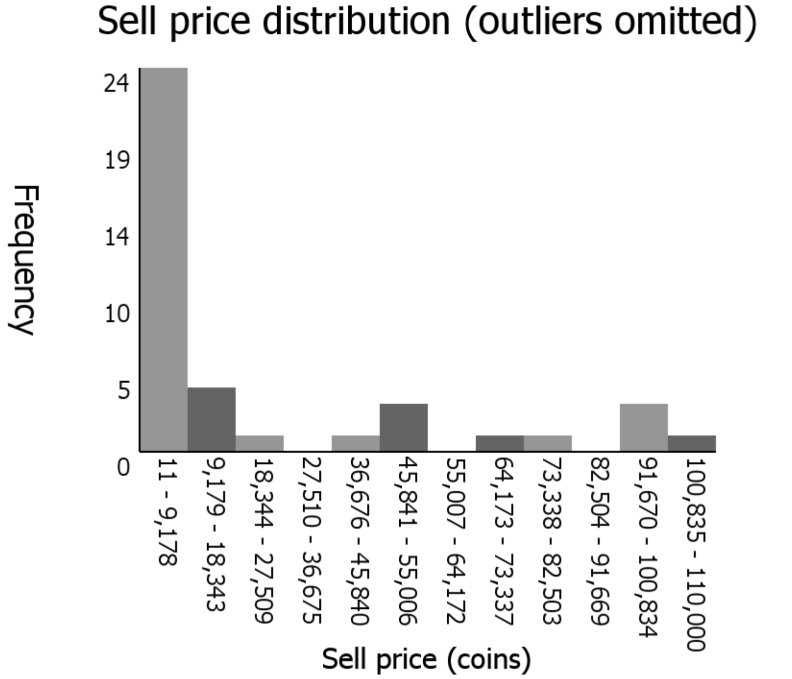
Inputs:
$\bar{x}_1 = 19{,}023.1053$ (coins)
$\bar{x}_2 = 101.7766$ (coins)
$S_1 = 28{,}121.6435$ (coins)
$S_2 = 36.5273$ (coins)
$n_1 = 38$
$n_2 = 6{,}997$

There is significant evidence at the $\alpha=0.05$ level of significance to support the claim that the mean selling price of an angler leggings is greater than the mean cost of the materials required to make it.

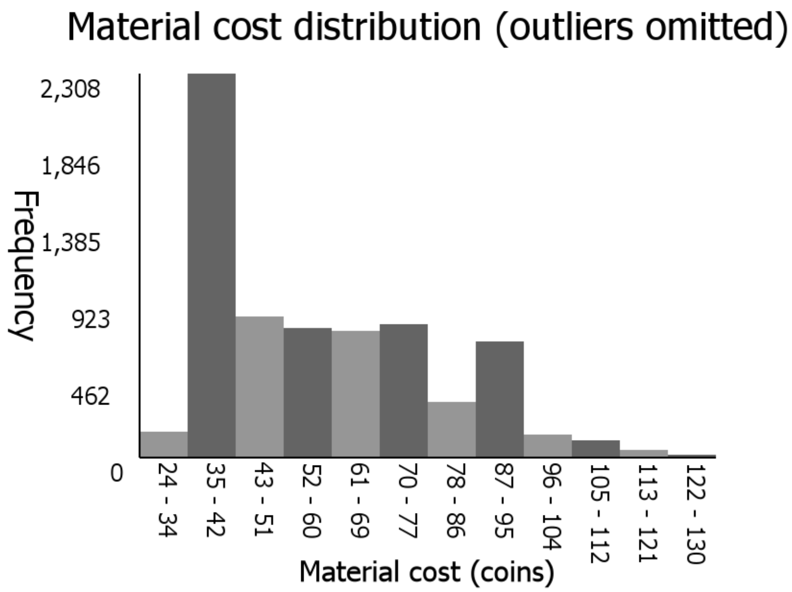
Since we rejected H_o, it suggests that on average people earned more coins from selling this item than it would have cost them to buy the materials.

Implication: the test suggests that on average we could make a profit from flipping this item.

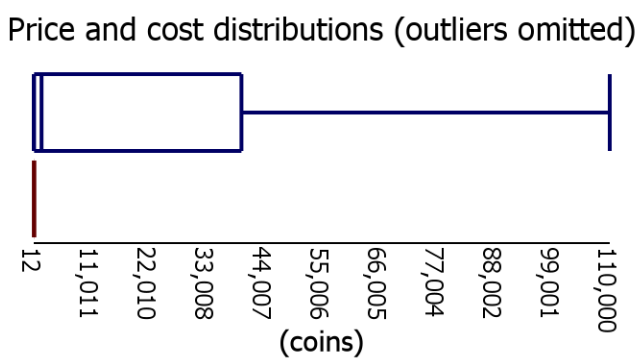
Selling prices and material costs of an angler boots

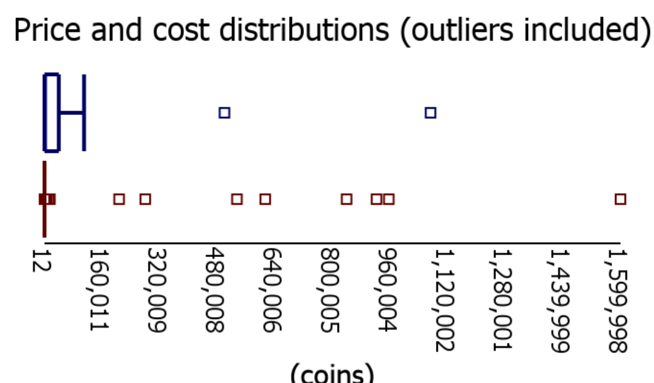


The distribution is centered around 1,500 coins (median). It has a high variability (IQR of 39,596 coins) and is skewed right. There are large gaps between 27,509 - 36,675 coins, 55,006 - 64,172 coins, and 82,503 - 91,669 coins. There are 0 outliers on the low end and 2 outliers on the high end, the highest being 1,072,449 coins.



The distribution is centered around 53 coins (median). It has a low variability (IQR of 35 coins) and is skewed right. There are no large gaps in the distribution. There are 0 outliers on the low end and 491 outliers on the high end, the highest being 1,599,998 coins.





Key:

Sell Price

Material Cost

5 number summeries (coins):

min: 12, q1: 79, median: 1,500, q3: 39,675, max: 110,000

min: 25, q1: 39, median: 53, q3: 74, max: 130

Statistical test comparing the selling prices and material costs of an angler boots

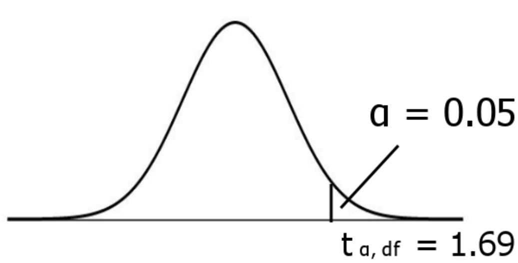
Let group1 = Sell prices of an angler boots, group2 = Material cost of an angler boots
X_1 = Sell price of an angler boots (coins), X_2 = Material cost of an angler boots (coins)
μ_1 = Mean sell price of an angler boots (coins), μ_2 = Mean material cost of an angler boots (coins)

H_o: $\mu_1 = \mu_2$ H_a: $\mu_1 > \mu_2$

Requirements for a difference of means test (σ_1 and σ_2 unknown):

1. 2 independent SRS's: ✓ $n_1 = 39$ $n_2 = 6997$
   One price/cost from either group will not affect any price/cost from either group
2. σ is not known, but S_x is: ✓ $S_1 = 34{,}386.1699$ coins $S_2 = 20.8727$ coins
3. $n_1 > 30$ and $n_2 > 30$: ✓ $n_1 = 39 > 30$ $n_2 = 6997 > 30$

Rejection Critieria:
$\alpha = 0.05$ df = 38



Reject H_o if $t > 1.69$

Test Statistic:

$$t = \frac{(\bar{x}_1 - \bar{x}_2) - (\mu_1 - \mu_2)}{\sqrt{\frac{S_1^2}{N_1} + \frac{S_2^2}{N_2}}}$$

Inputs:
$\bar{x}_1 = 21{,}337.2821$ (coins)
$\bar{x}_2 = 58.1588$ (coins)
$S_1 = 34{,}386.1699$ (coins)
$S_2 = 20.8727$ (coins)
$n_1 = 39$
$n_2 = 6{,}997$

$t = 3.86$
p-value = 0.0002

Reject H_o since $3.86 > 1.69$

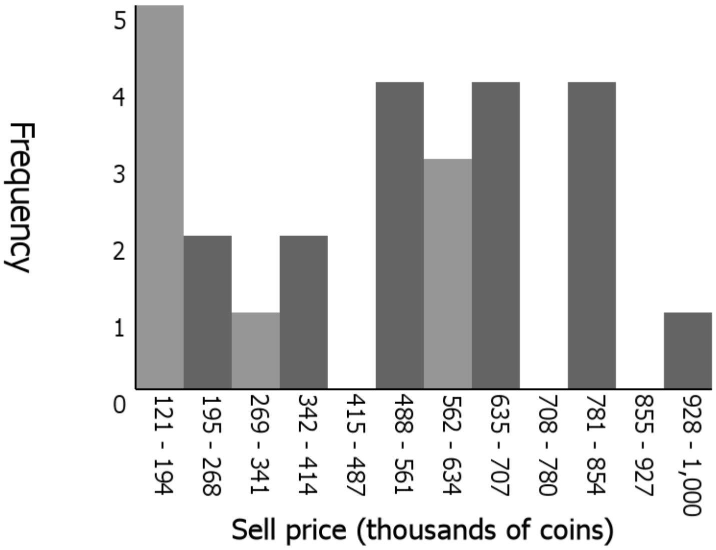
There is significant evidence at the α=0.05 level of significance to support the claim that the mean selling price of an angler boots is greater than the mean cost of the materials required to make it.

Since we rejected H_o, it suggests that on average people earned more coins from selling this item than it would have cost them to buy the materials.

Implication: the test suggests that on average we could make a profit from flipping this item.

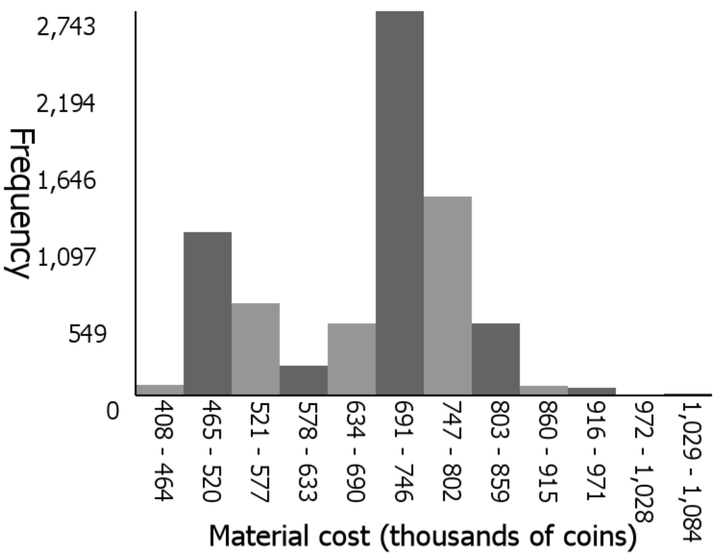
Selling prices and material costs of a runaans bow

Sell price distribution (outliers omitted)



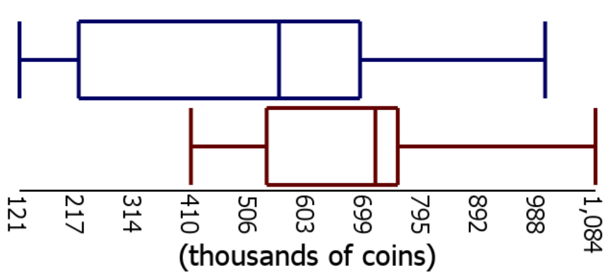
The distribution is centered around 555,000 coins (median). It has a low variability (IQR of 470,454 coins) and is skewed left. There are large gaps between 414,000 - 487,250 coins, 707,000 - 780,250 coins, and 853,500 - 926,750 coins. There are 0 outliers on the low end and 1 outliers on the high end, the highest being 1,582,336 coins.

Material cost distribution (outliers omitted)

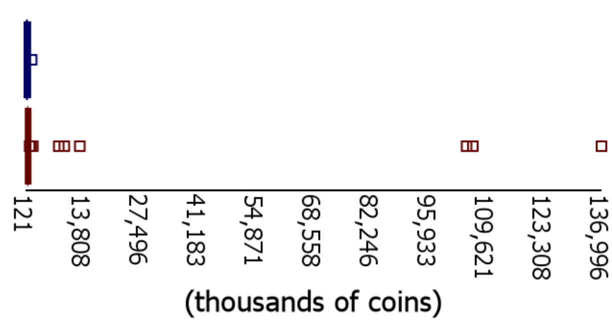


The distribution is centered around 716,102 coins (median). It has a low variability (IQR of 219,256 coins) and is skewed left. There are no large gaps in the distribution. There are 0 outliers on the low end and 40 outliers on the high end, the highest being 136,995,837 coins.

Price and cost distributions (outliers omitted)



Price and cost distributions (outliers included)



Key:

Sell Price

Material Cost

5 number summeries (thousands of coins):

min: 121, q1: 220, median: 555, q3: 690, max: 1,000

min: 408, q1: 534, median: 716, q3: 754, max: 1,084

Statistical test comparing the selling prices and material costs of a <u>runaans bow</u>

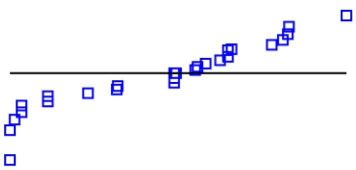
Let group1 = Sell prices of a runaans bow, group2 = Material cost of a runaans bow
X_1 = Sell price of a runaans bow (coins), X_2 = Material cost of a runaans bow (coins)
μ_1 = Mean sell price of a runaans bow (coins), μ_2 = Mean material cost of a runaans bow (coins)

H_o: $\mu_1 = \mu_2$ H_a: $\mu_1 > \mu_2$

<u>Requirements for a difference of means test (σ_1 and σ_2 unknown):</u>

1. 2 independent SRS's: ✓ $n_1 = 26$ $n_2 = 7448$
   One price/cost from either group will not affect any price/cost from either group
2. σ is not known, but S_x is: ✓ S_1 = 265,065.3087 coins S_2 = 116,377.4265 coins
3. Group1 is normally distributed and $n_2 > 30$: ✓

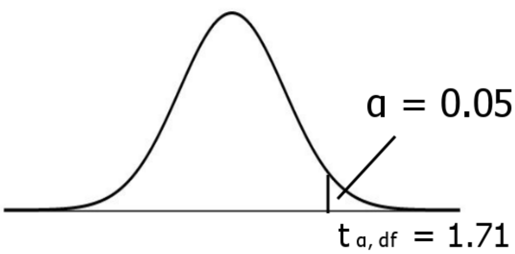
Quantile plot of sell prices



$n_2 = 7448 > 30$

<u>Rejection Critieria:</u>

$\alpha = 0.05$ df = 25



Reject H_o if $t > 1.71$

<u>Test Statistic:</u>

$$t = \frac{(\bar{x}_1 - \bar{x}_2) - (\mu_1 - \mu_2)}{\sqrt{\frac{S_1^2}{N_1} + \frac{S_2^2}{N_2}}}$$

$t = -3.14$
p-value = 0.9979

Fail to reject H_o since $-3.14 < 1.71$

Inputs:

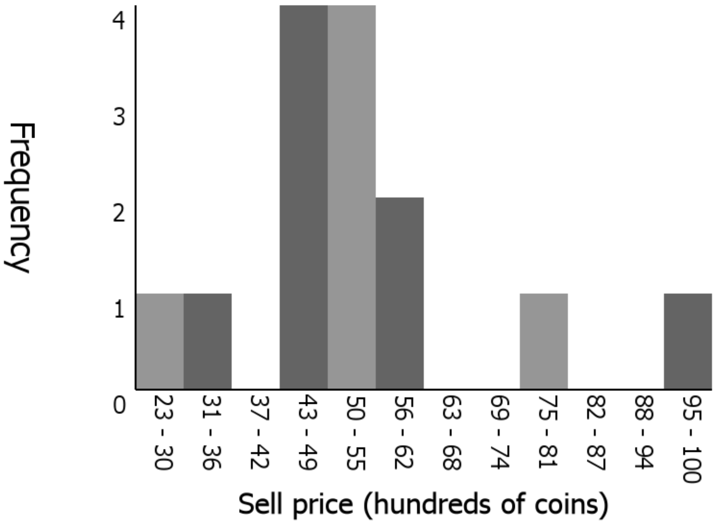
$\bar{x}_1$ = 514,840.8077 (coins)
$\bar{x}_2$ = 678,315.3902 (coins)
S_1 = 265,065.3087 (coins)
S_2 = 116,377.4265 (coins)
n_1 = 26
n_2 = 7,448

There is not significant evidence at the α=0.05 level of significance to support the claim that the mean selling price of a runaans bow is greater than the mean cost of the materials required to make it.

Since we failed to reject H_o, it suggests that on average people did not earn more coins from selling this item than it would have cost them to buy the materials.

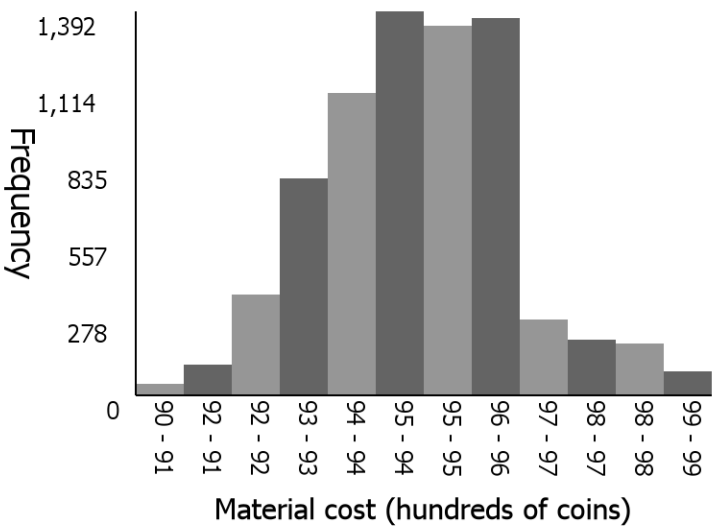
Selling prices and material costs of a hardened diamond leggings

Sell price distribution (outliers omitted)



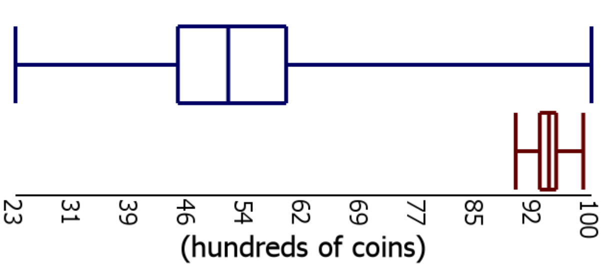
The distribution is centered around 5,152 coins (median). It has a low variability (IQR of 1,445 coins) and is mostly symmetrical. There are large gaps between 3,594 - 4,235 coins, 6,157 - 7,438 coins, and 8,078 - 9,359 coins. There are 0 outliers on the low end and 3 outliers on the high end, the highest being 26,149 coins.

Material cost distribution (outliers omitted)

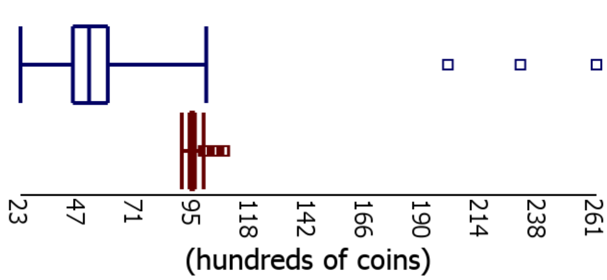


The distribution is centered around 9,433 coins (median). It has a low variability (IQR of 219 coins) and is mostly symmetrical. There are no large gaps in the distribution. There are 0 outliers on the low end and 234 outliers on the high end, the highest being 10,748 coins.

Price and cost distributions (outliers omitted)



Price and cost distributions (outliers included)



Key:

Sell Price

Material Cost

5 number summeries (hundreds of coins):

min: 23, q1: 45, median: 52, q3: 59, max: 100

min: 90, q1: 93, median: 94, q3: 95, max: 99

Statistical test comparing the selling prices and material costs of a hardened diamond leggings

Let group1 = Sell prices of a hardened diamond leggings, group2 = Material cost of a hardened diamond leggings

X_1 = Sell price of a hardened diamond leggings (coins), X_2 = Material cost of a hardened diamond leggings (coins)

μ_1 = Mean sell price of a hardened diamond leggings (coins),

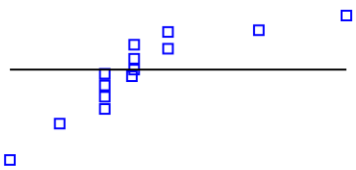
μ_2 = Mean material cost of a hardened diamond leggings (coins)

H_o: $\mu_1 = \mu_2$ H_a: $\mu_1 > \mu_2$

Requirements for a difference of means test (σ_1 and σ_2 unknown):

1. 2 independent SRS's: ✓ $n_1 = 14$ $n_2 = 7254$
   One price/cost from either group will not affect any price/cost from either group
2. σ is not known, but S_x is: ✓ S_1 = 1,866.7197 coins S_2 = 154.7006 coins
3. Group1 is normally distributed and $n_2 > 30$: ✓

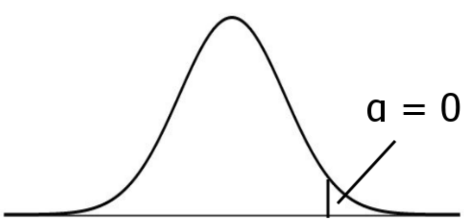
Quantile plot of sell prices



$n_2 = 7254 > 30$

Rejection Critieria:

$\alpha = 0.05$ df = 13



Reject H_o if $t > 1.77$

Test Statistic:

$$t = \frac{(\bar{x}_1 - \bar{x}_2) - (\mu_1 - \mu_2)}{\sqrt{\frac{S_1^2}{N_1} + \frac{S_2^2}{N_2}}}$$

$t = -8.29$

p-value > 0.9999

Inputs:

$\bar{x}_1$ = 5,292.0714 (coins)

$\bar{x}_2$ = 9,426.4365 (coins)

S_1 = 1,866.7197 (coins)

S_2 = 154.7006 (coins)

$n_1 = 14$

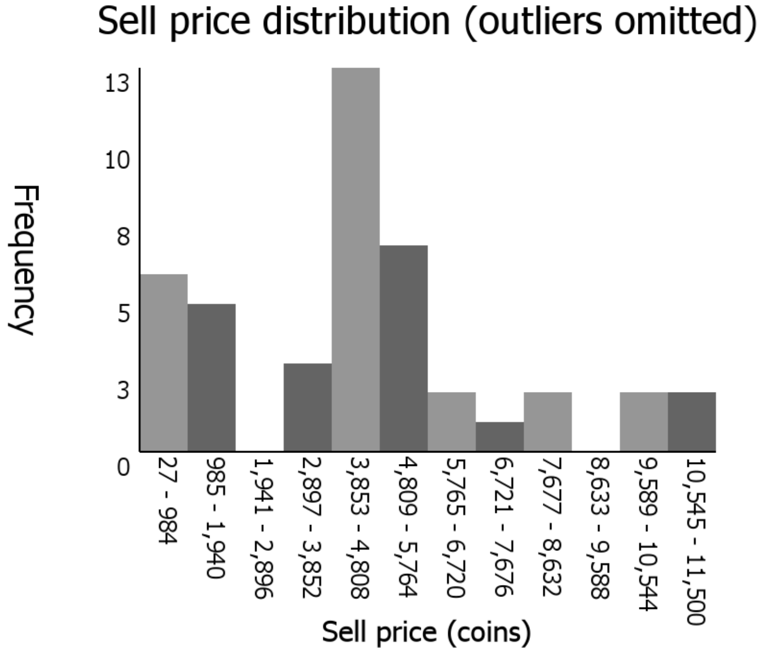
n_2 = 7,254

Fail to reject H_o since $-8.29 < 1.77$

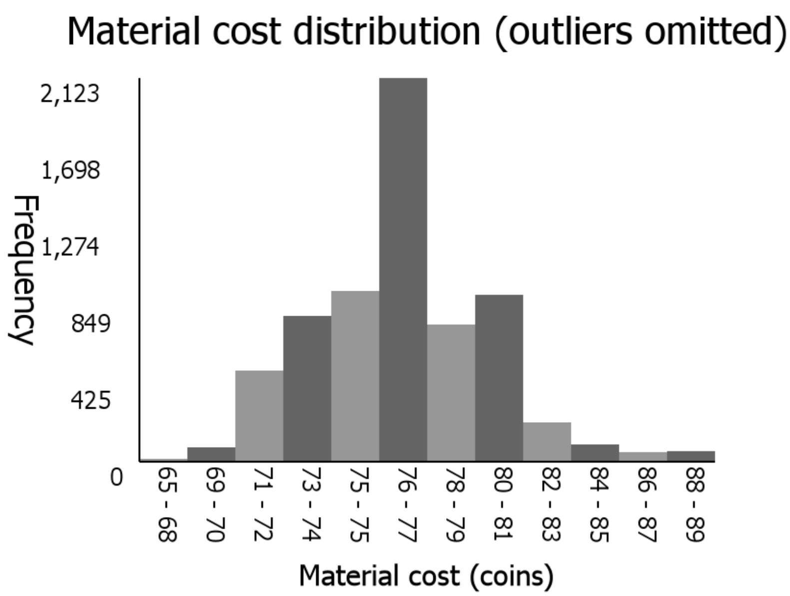
There is not significant evidence at the α=0.05 level of significance to support the claim that the mean selling price of a hardened diamond leggings is greater than the mean cost of the materials required to make it.

Since we failed to reject H_o, it suggests that on average people did not earn more coins from selling this item than it would have cost them to buy the materials.

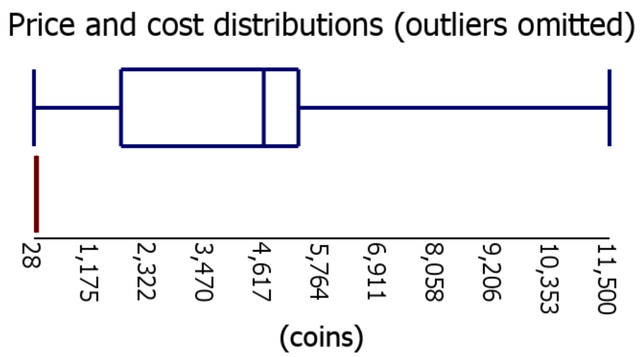
Selling prices and material costs of a block of diamond

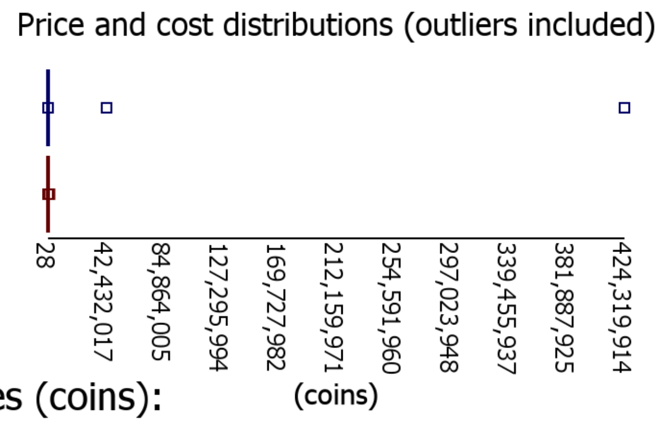


The distribution is centered around 4,608 coins (median). It has a low variability (IQR of 3,536 coins) and is mostly symmetrical. There are large gaps between 1,940 - 2,896 coins and 8,632 - 9,588 coins. There are 0 outliers on the low end and 6 outliers on the high end, the highest being 424,319,914 coins.



The distribution is centered around 77 coins (median). It has a low variability (IQR of 5 coins) and is mostly symmetrical. There are no large gaps in the distribution. There are 10 outliers on the low end, the lowest being 63 coins and 898 outliers on the high end, the highest being 1,079,997 coins.





Key:

Sell Price

Material Cost

5 number summeries (coins):

min: 28, q1: 1,763, median: 4,608, q3: 5,299, max: 11,500

min: 66, q1: 74, median: 77, q3: 79, max: 89

Statistical test comparing the selling prices and material costs of a block of diamond

Let group1 = Sell prices of a block of diamond, group2 = Material cost of a block of diamond
X_1 = Sell price of a block of diamond (coins), X_2 = Material cost of a block of diamond (coins)
μ_1 = Mean sell price of a block of diamond (coins), μ_2 = Mean material cost of a block of diamond (coins)

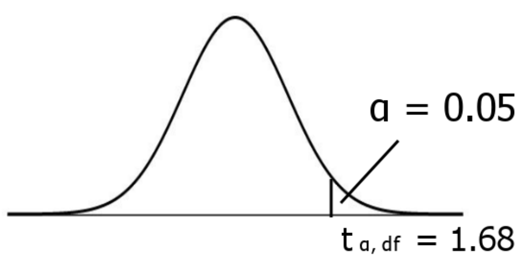
H_o: $\mu_1 = \mu_2$ H_a: $\mu_1 > \mu_2$

Requirements for a difference of means test (σ_1 and σ_2 unknown):

1. 2 independent SRS's: ✓ $n_1 = 43$ $n_2 = 6580$
   One price/cost from either group will not affect any price/cost from either group
2. σ is not known, but S_x is: ✓ S_1 = 2,892.2692 coins S_2 = 3.6411 coins
3. $n_1 > 30$ and $n_2 > 30$: ✓ $n_1 = 43 > 30$ $n_2 = 6580 > 30$

Rejection Critieria:

$\alpha = 0.05$ df = 42



Reject H_o if $t > 1.68$

Test Statistic:

$$t = \frac{(\bar{x}_1 - \bar{x}_2) - (\mu_1 - \mu_2)}{\sqrt{\frac{S_1^2}{N_1} + \frac{S_2^2}{N_2}}}$$

$t = 10.09$
p-value < 0.0001

Reject H_o since $10.09 > 1.68$

Inputs:

$\bar{x}_1$ = 4,528.3023 (coins)
$\bar{x}_2$ = 76.4495 (coins)
S_1 = 2,892.2692 (coins)
S_2 = 3.6411 (coins)
n_1 = 43
n_2 = 6,580

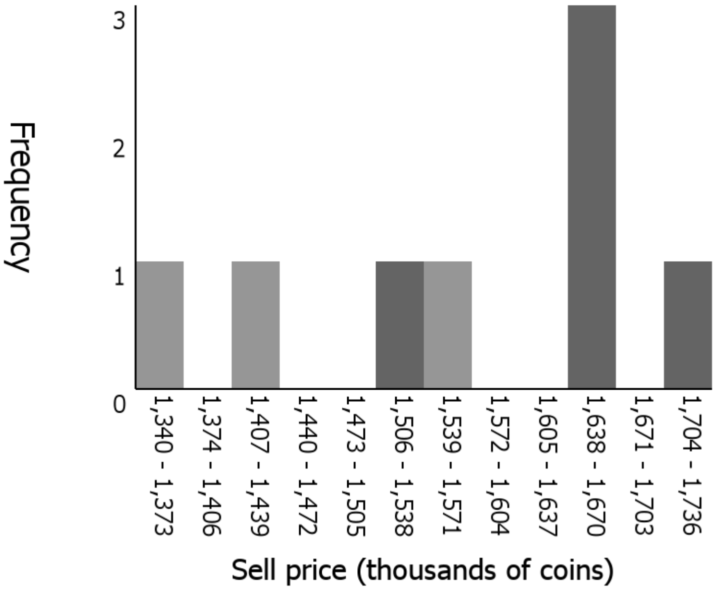
There is significant evidence at the α=0.05 level of significance to support the claim that the mean selling price of a block of diamond is greater than the mean cost of the materials required to make it.

Since we rejected H_o, it suggests that on average people earned more coins from selling this item than it would have cost them to buy the materials.

Implication: the test suggests that on average we could make a profit from flipping this item.

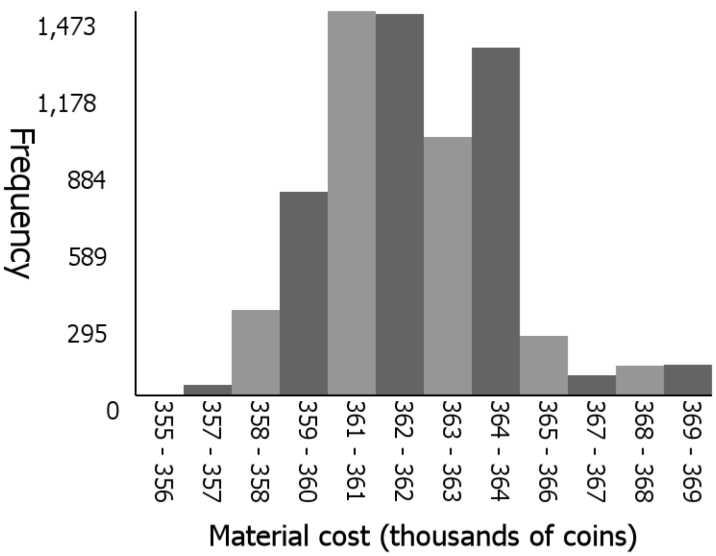
Selling prices and material costs of a melon leggings

Sell price distribution (outliers omitted)



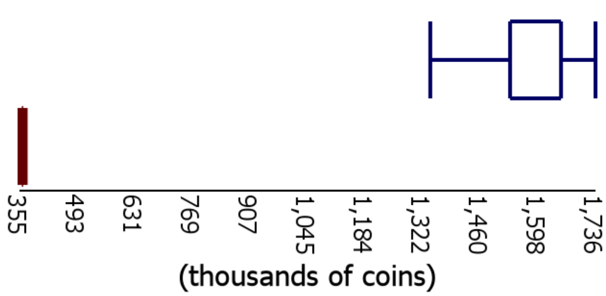
The distribution is centered around 1,653,750 coins (median). It has a low variability (IQR of 122,212 coins) and is skewed left. There are large gaps between 1,373,124 - 1,406,152 coins, 1,439,181 - 1,505,238 coins, 1,571,295 - 1,637,352 coins, and 1,670,381 - 1,703,409 coins. There are 1 outliers on the low end, the lowest being 555,994 coins and 1 outliers on the high end, the highest being 2,010,144 coins.

Material cost distribution (outliers omitted)

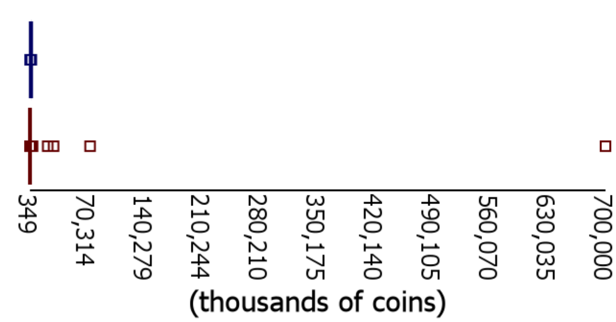


The distribution is centered around 361,507 coins (median). It has a low variability (IQR of 3,329 coins) and is mostly symmetrical. There are no large gaps in the distribution. There are 6 outliers on the low end, the lowest being 349,262 coins and 545 outliers on the high end, the highest being 699,999,999 coins.

Price and cost distributions (outliers omitted)



Price and cost distributions (outliers included)



Key:

Sell Price

Material Cost

5 number summeries (thousands of coins):

min: 1,340, q1: 1,532, median: 1,654, q3: 1,654, max: 1,736

min: 355, q1: 360, median: 362, q3: 363, max: 369

Statistical test comparing the selling prices and material costs of a melon leggings

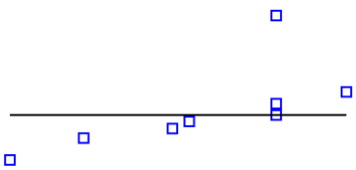
Let group1 = Sell prices of a melon leggings, group2 = Material cost of a melon leggings
X_1 = Sell price of a melon leggings (coins), X_2 = Material cost of a melon leggings (coins)
μ_1 = Mean sell price of a melon leggings (coins), μ_2 = Mean material cost of a melon leggings (coins)

H_o: $\mu_1 = \mu_2$ H_a: $\mu_1 > \mu_2$

Requirements for a difference of means test (σ_1 and σ_2 unknown):

1. 2 independent SRS's: ✓ $n_1 = 8$ $n_2 = 6937$
   One price/cost from either group will not affect any price/cost from either group
2. σ is not known, but S_x is: ✓ S_1 = 133,028.8266 coins S_2 = 2,385.4922 coins
3. Group1 is normally distributed and $n_2 > 30$: ✓

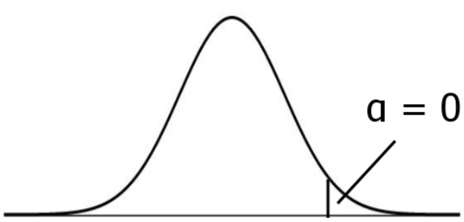
Quantile plot of sell prices



$n_2 = 6937 > 30$

Rejection Critieria:

$\alpha = 0.05$ df = 7



$t_{\alpha, df} = 1.90$

Reject H_o if $t > 1.90$

Test Statistic:

$$t = \frac{(\bar{x}_1 - \bar{x}_2) - (\mu_1 - \mu_2)}{\sqrt{\frac{S_1^2}{N_1} + \frac{S_2^2}{N_2}}}$$

$t = 25.66$
p-value < 0.0001

Inputs:

$\bar{x}_1$ = 1,568,447.875 (coins)
$\bar{x}_2$ = 361,670.2717 (coins)
S_1 = 133,028.8266 (coins)
S_2 = 2,385.4922 (coins)
$n_1 = 8$
n_2 = 6,937

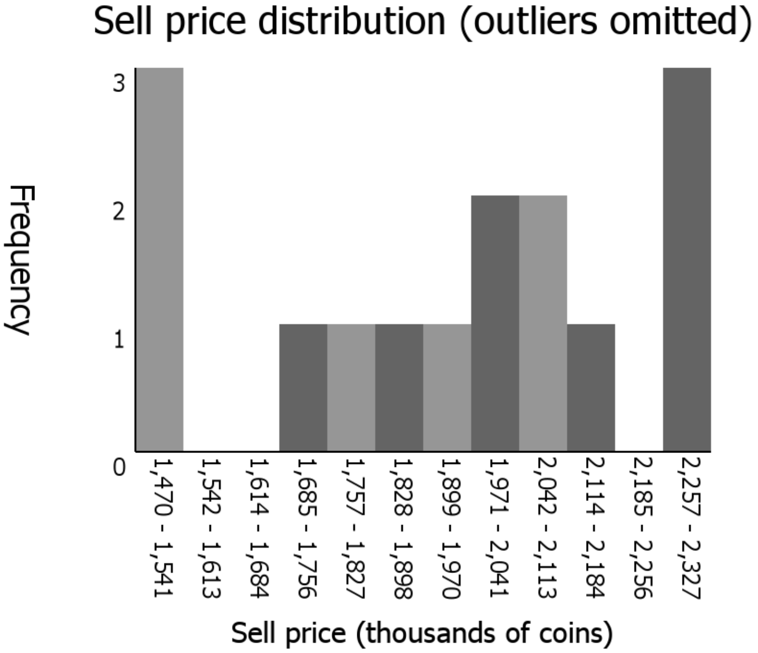
Reject H_o since $25.66 > 1.90$

There is significant evidence at the α=0.05 level of significance to support the claim that the mean selling price of a melon leggings is greater than the mean cost of the materials required to make it.

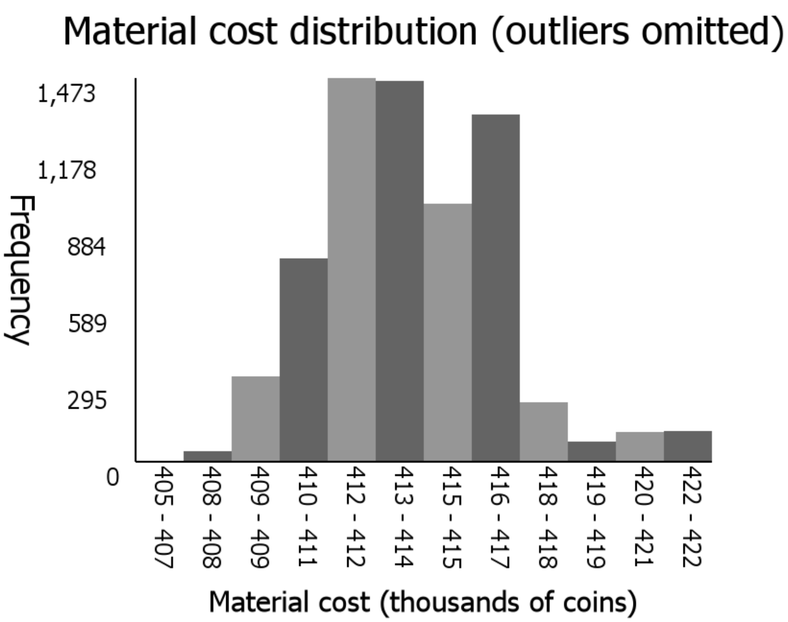
Since we rejected H_o, it suggests that on average people earned more coins from selling this item than it would have cost them to buy the materials.

Implication: the test suggests that on average we could make a profit from flipping this item.

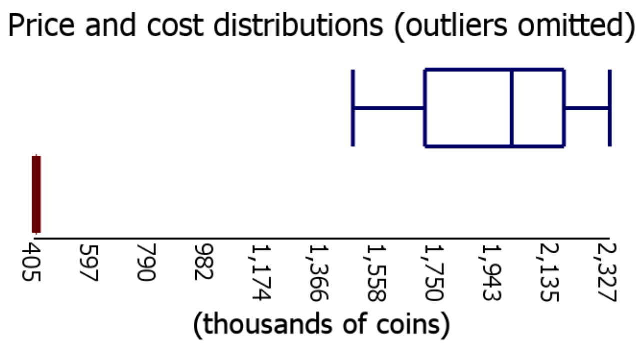
Selling prices and material costs of a melon chestplate

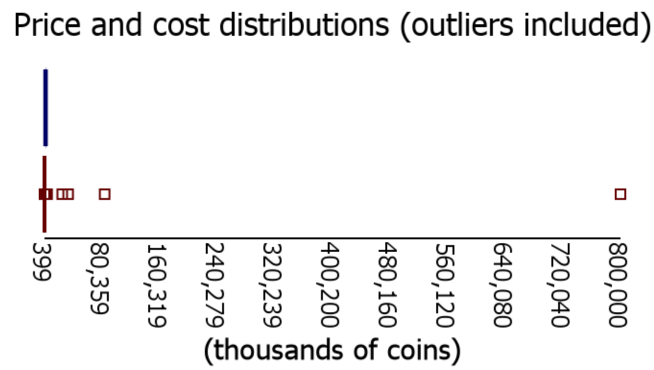


The distribution is centered around 2,000,000 coins (median). It has a low variability (IQR of 463,774 coins) and is mostly symmetrical. There are large gaps between 1,541,416 - 1,684,248 coins and 2,184,161 - 2,255,577 coins. There are 0 outliers on the low end and 0 outliers on the high end.



The distribution is centered around 413,151 coins (median). It has a low variability (IQR of 3,804 coins) and is mostly symmetrical. There are no large gaps in the distribution. There are 6 outliers on the low end, the lowest being 399,157 coins and 545 outliers on the high end, the highest being 799,999,999 coins.





Key:

Sell Price

Material Cost

5 number summeries (thousands of coins):

min: 1,470, q1: 1,710, median: 2,000, q3: 2,174, max: 2,327

min: 405, q1: 412, median: 413, q3: 415, max: 422

Statistical test comparing the selling prices and material costs of a melon chestplate

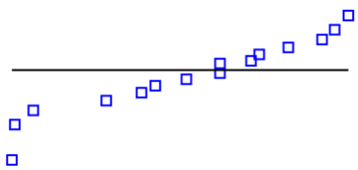
Let group1 = Sell prices of a melon chestplate, group2 = Material cost of a melon chestplate
X_1 = Sell price of a melon chestplate (coins), X_2 = Material cost of a melon chestplate (coins)
μ_1 = Mean sell price of a melon chestplate (coins), μ_2 = Mean material cost of a melon chestplate (coins)

H_o: $\mu_1 = \mu_2$ H_a: $\mu_1 > \mu_2$

Requirements for a difference of means test (σ_1 and σ_2 unknown):

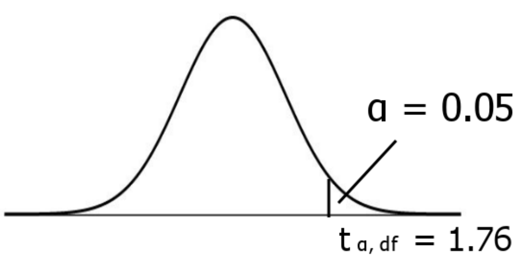
1. 2 independent SRS's: ✓ $n_1 = 15$ $n_2 = 6937$
   One price/cost from either group will not affect any price/cost from either group
2. σ is not known, but S_x is: ✓ S_1 = 289,478.4881 coins S_2 = 2,726.2757 coins
3. Group1 is normally distributed and $n_2 > 30$: ✓

Quantile plot of sell prices



$n_2 = 6937 > 30$

Rejection Critieria:
$\alpha = 0.05$ df = 14



Reject H_o if $t > 1.76$

Test Statistic:

$$t = \frac{(\bar{x}_1 - \bar{x}_2) - (\mu_1 - \mu_2)}{\sqrt{\frac{S_1^2}{N_1} + \frac{S_2^2}{N_2}}}$$

$t = 20.30$
p-value < 0.0001

Reject H_o since $20.30 > 1.76$

Inputs:
$\bar{x}_1$ = 1,930,938.5333 (coins)
$\bar{x}_2$ = 413,337.4536 (coins)
S_1 = 289,478.4881 (coins)
S_2 = 2,726.2757 (coins)
n_1 = 15
n_2 = 6,937

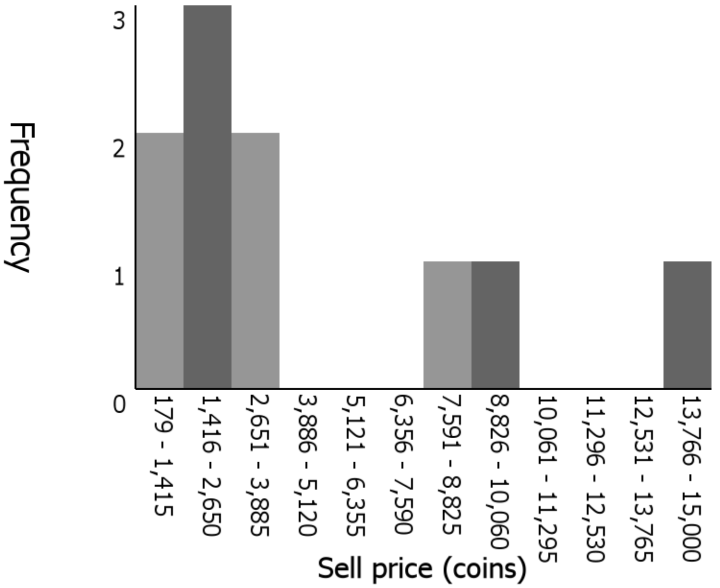
There is significant evidence at the α=0.05 level of significance to support the claim that the mean selling price of a melon chestplate is greater than the mean cost of the materials required to make it.

Since we rejected H_o, it suggests that on average people earned more coins from selling this item than it would have cost them to buy the materials.

Implication: the test suggests that on average we could make a profit from flipping this item.

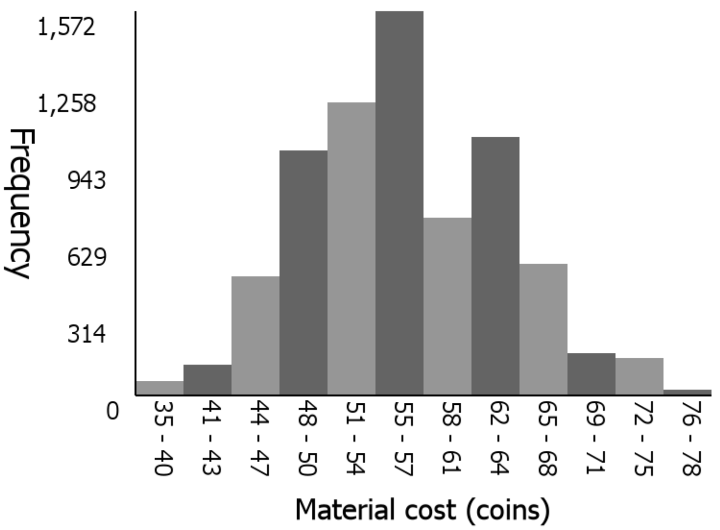
Selling prices and material costs of a block of gold

Sell price distribution (outliers omitted)



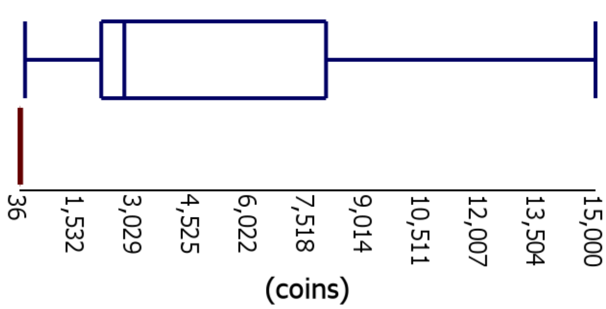
The distribution is centered around 2,760 coins (median). It has a moderate variability (IQR of 5,840 coins) and is skewed right. There are large gaps between 3,885 - 7,590 coins and 10,060 - 13,765 coins. There are 0 outliers on the low end and 1 outliers on the high end, the highest being 24,807 coins.

Material cost distribution (outliers omitted)

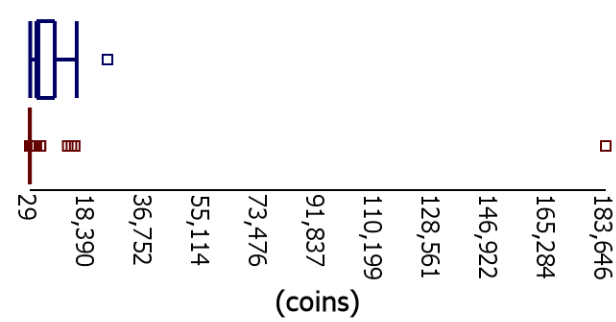


The distribution is centered around 55 coins (median). It has a low variability (IQR of 11 coins) and is mostly symmetrical. There are no large gaps in the distribution. There are 4 outliers on the low end, the lowest being 29 coins and 369 outliers on the high end, the highest being 183,646 coins.

Price and cost distributions (outliers omitted)



Price and cost distributions (outliers included)



Key:

Sell Price

Material Cost

5 number summeries (coins):

min: 180, q1: 2,160, median: 2,760, q3: 8,000, max: 15,000

min: 36, q1: 50, median: 55, q3: 61, max: 78

Statistical test comparing the selling prices and material costs of a block of gold

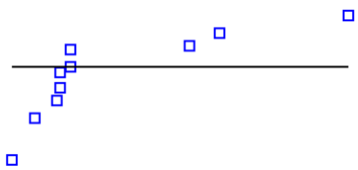
Let group1 = Sell prices of a block of gold, group2 = Material cost of a block of gold
X_1 = Sell price of a block of gold (coins), X_2 = Material cost of a block of gold (coins)
μ_1 = Mean sell price of a block of gold (coins), μ_2 = Mean material cost of a block of gold (coins)

H_o: $\mu_1 = \mu_2$ H_a: $\mu_1 > \mu_2$

Requirements for a difference of means test (σ_1 and σ_2 unknown):

1. 2 independent SRS's: ✓ $n_1 = 10$ $n_2 = 7115$
   One price/cost from either group will not affect any price/cost from either group
2. σ is not known, but S_x is: ✓ S_1 = 4,672.5173 coins S_2 = 7.245 coins
3. Group1 is normally distributed and $n_2 > 30$: ✓

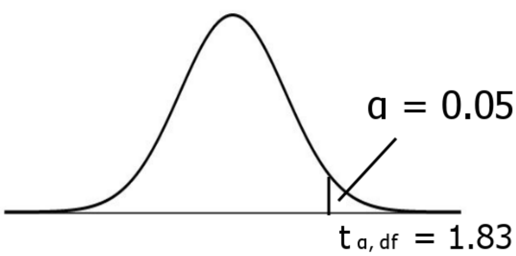
Quantile plot of sell prices



$n_2 = 7115 > 30$

Rejection Critieria:

$\alpha = 0.05$ df = 9



Reject H_o if $t > 1.83$

Test Statistic:

$$t = \frac{(\bar{x}_1 - \bar{x}_2) - (\mu_1 - \mu_2)}{\sqrt{\frac{S_1^2}{N_1} + \frac{S_2^2}{N_2}}}$$

$t = 3.07$
p-value = 0.0066

Reject H_o since 3.07 > 1.83

Inputs:

$\bar{x}_1$ = 4,598.1 (coins)
$\bar{x}_2$ = 55.5747 (coins)
S_1 = 4,672.5173 (coins)
S_2 = 7.245 (coins)
n_1 = 10
n_2 = 7,115

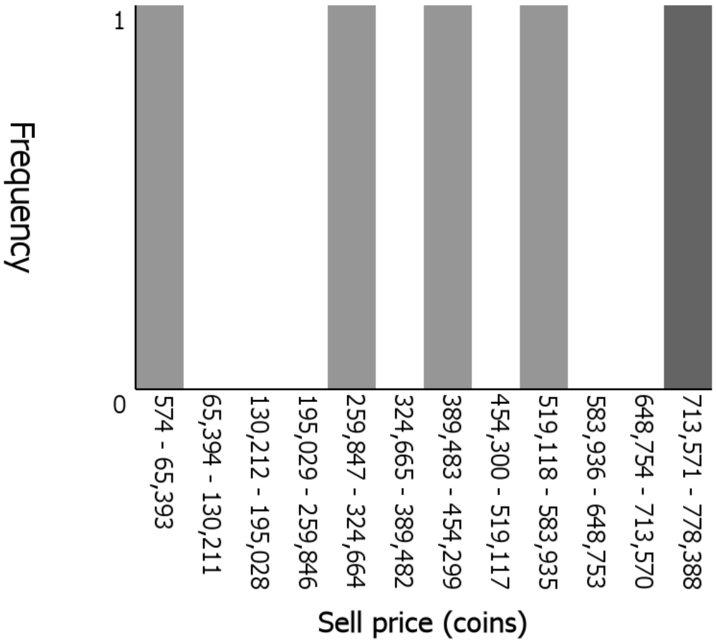
There is significant evidence at the α=0.05 level of significance to support the claim that the mean selling price of a block of gold is greater than the mean cost of the materials required to make it.

Since we rejected H_o, it suggests that on average people earned more coins from selling this item than it would have cost them to buy the materials.

Implication: the test suggests that on average we could make a profit from flipping this item.

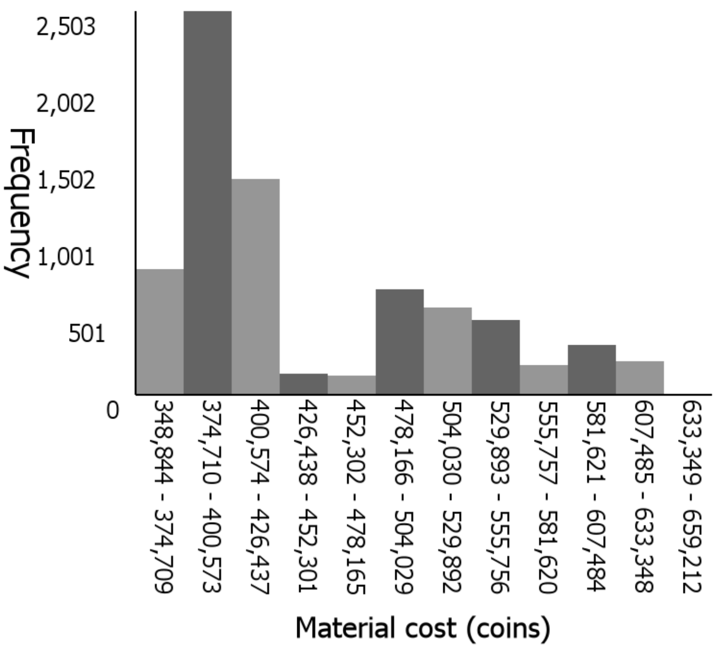
Selling prices and material costs of a rabbit leggings

Sell price distribution (outliers omitted)



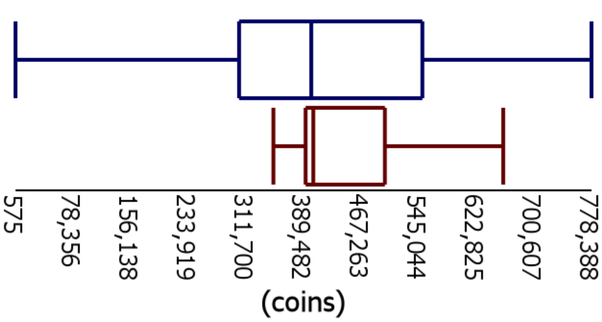
The distribution is centered around 400,000 coins (median). It has a low variability (IQR of 247,500 coins) and is mostly symmetrical. There are large gaps between 65,393 - 259,846 coins, 324,664 - 389,482 coins, 454,299 - 519,117 coins, and 583,935 - 713,570 coins. There are 0 outliers on the low end and 0 outliers on the high end.

Material cost distribution (outliers omitted)

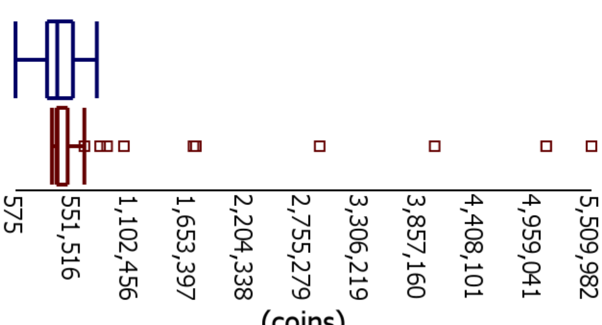


The distribution is centered around 402,728 coins (median). It has a low variability (IQR of 107,026 coins) and is skewed right. There are no large gaps in the distribution. There are 0 outliers on the low end and 13 outliers on the high end, the highest being 5,509,982 coins.

Price and cost distributions (outliers omitted)



Price and cost distributions (outliers included)



Key:

Sell Price

Material Cost

5 number summeries (coins):

min: 575, q1: 302,500, median: 400,000, q3: 550,000, max: 778,388

min: 348,845, q1: 392,348, median: 402,728, q3: 499,375, max: 659,212

Statistical test comparing the selling prices and material costs of a rabbit leggings

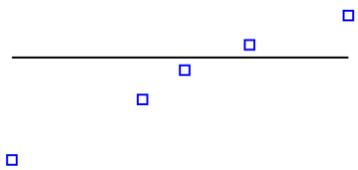
Let group1 = Sell prices of a rabbit leggings, group2 = Material cost of a rabbit leggings
X_1 = Sell price of a rabbit leggings (coins), X_2 = Material cost of a rabbit leggings (coins)
μ_1 = Mean sell price of a rabbit leggings (coins), μ_2 = Mean material cost of a rabbit leggings (coins)

H_o: $\mu_1 = \mu_2$ H_a: $\mu_1 > \mu_2$

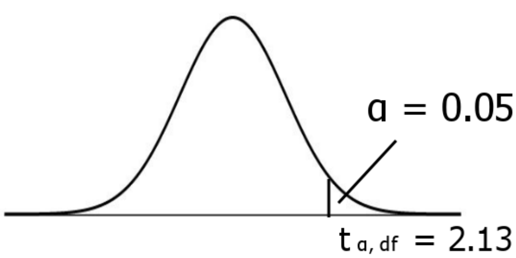
Requirements for a difference of means test (σ_1 and σ_2 unknown):

1. 2 independent SRS's: ✓ $n_1 = 5$ $n_2 = 7475$
   One price/cost from either group will not affect any price/cost from either group
2. σ is not known, but S_x is: ✓ S_1 = 289,191.1457 coins S_2 = 74,155.0004 coins
3. Group1 is normally distributed and $n_2 > 30$: ✓

Quantile plot of sell prices $n_2 = 7475 > 30$



Rejection Critieria:
$\alpha = 0.05$ df = 4



Reject H_o if $t > 2.13$

Test Statistic:

$$t = \frac{(\bar{x}_1 - \bar{x}_2) - (\mu_1 - \mu_2)}{\sqrt{\frac{S_1^2}{N_1} + \frac{S_2^2}{N_2}}}$$

$t = -0.28$
p-value = 0.6020

Inputs:
$\bar{x}_1$ = 406,292.6 (coins)
$\bar{x}_2$ = 442,031.9075 (coins)
S_1 = 289,191.1457 (coins)
S_2 = 74,155.0004 (coins)
$n_1 = 5$
n_2 = 7,475

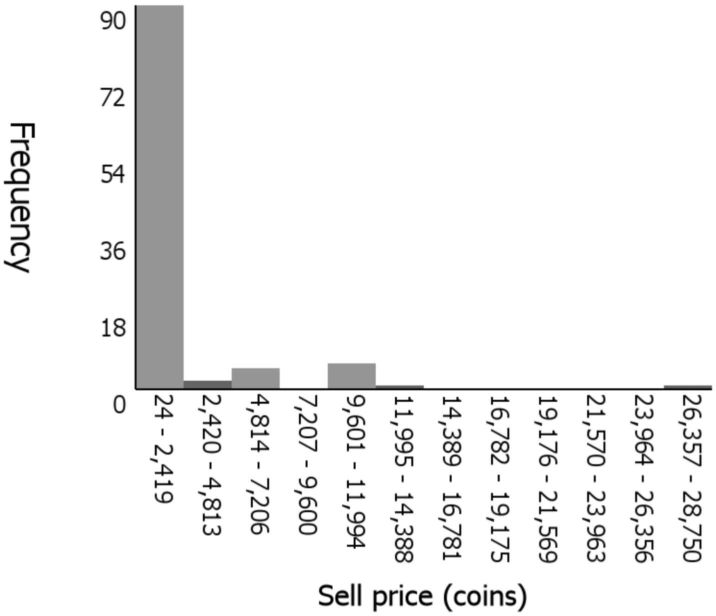
Fail to reject H_o since $-0.28 < 2.13$

There is not significant evidence at the α=0.05 level of significance to support the claim that the mean selling price of a rabbit leggings is greater than the mean cost of the materials required to make it.

Since we failed to reject H_o, it suggests that on average people did not earn more coins from selling this item than it would have cost them to buy the materials.

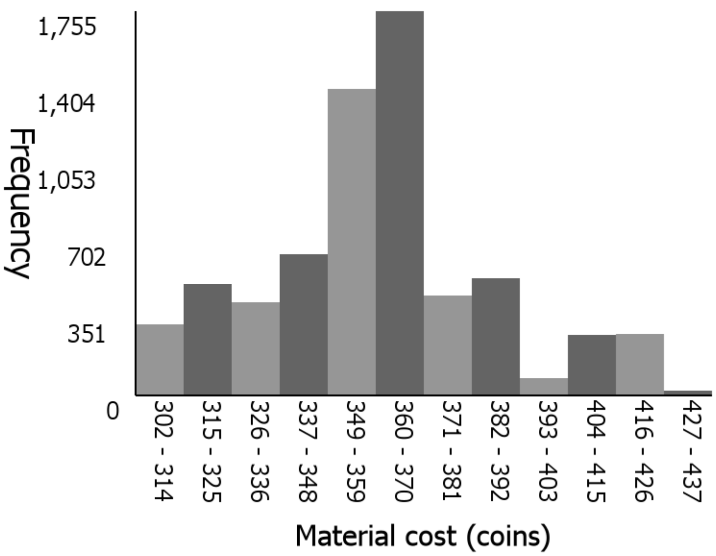
Selling prices and material costs of a farming talisman

Sell price distribution (outliers omitted)



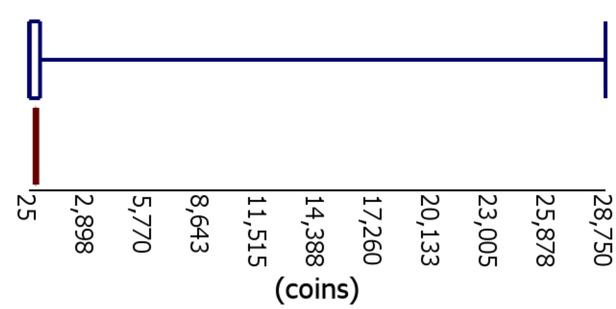
The distribution is centered around 64 coins (median). It has a high variability (IQR of 546 coins) and is skewed right. There are large gaps between 7,206 - 9,600 coins and 14,388 - 26,356 coins. There are 0 outliers on the low end and 33 outliers on the high end, the highest being 11,900,819 coins.

Material cost distribution (outliers omitted)

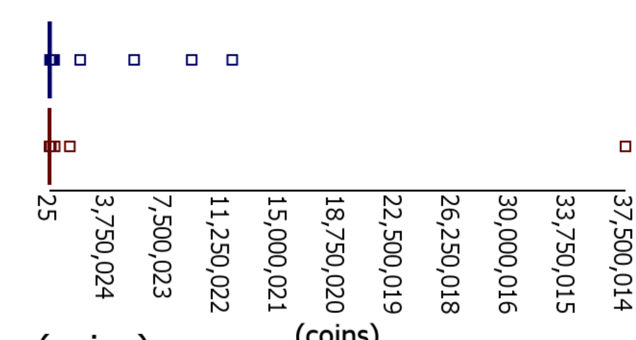


The distribution is centered around 359 coins (median). It has a low variability (IQR of 26 coins) and is mostly symmetrical. There are no large gaps in the distribution. There are 3 outliers on the low end, the lowest being 246 coins and 769 outliers on the high end, the highest being 37,500,014 coins.

Price and cost distributions (outliers omitted)



Price and cost distributions (outliers included)



Key:

Sell Price

Material Cost

5 number summeries (coins):

min: 25, q1: 29, median: 64, q3: 575, max: 28,750

min: 303, q1: 344, median: 359, q3: 369, max: 437

Statistical test comparing the selling prices and material costs of a farming talisman

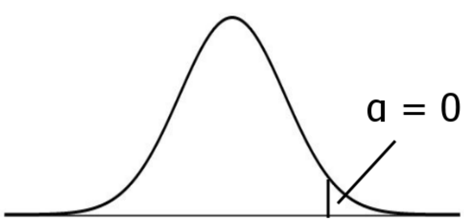
Let group1 = Sell prices of a farming talisman, group2 = Material cost of a farming talisman
X_1 = Sell price of a farming talisman (coins), X_2 = Material cost of a farming talisman (coins)
μ_1 = Mean sell price of a farming talisman (coins), μ_2 = Mean material cost of a farming talisman (coins)

$H_o: \mu_1 = \mu_2 \quad H_a: \mu_1 > \mu_2$

Requirements for a difference of means test (σ_1 and σ_2 unknown):

1. 2 independent SRS's: ✓ $n_1 = 105$ $n_2 = 6716$
   One price/cost from either group will not affect any price/cost from either group
2. σ is not known, but S_x is: ✓ $S_1 = 3{,}891.6639$ coins $S_2 = 26.4387$ coins
3. $n_1 > 30$ and $n_2 > 30$: ✓ $n_1 = 105 > 30$ $n_2 = 6716 > 30$

Rejection Critieria:
$\alpha = 0.05$ df = 104



$\alpha = 0.05$

$t_{\alpha, df} = 1.66$

Reject H_o if $t > 1.66$

Test Statistic:

$$t = \frac{(\bar{x}_1 - \bar{x}_2) - (\mu_1 - \mu_2)}{\sqrt{\frac{S_1^2}{N_1} + \frac{S_2^2}{N_2}}}$$

$t = 2.94$
p-value = 0.0021

Reject H_o since $2.94 > 1.66$

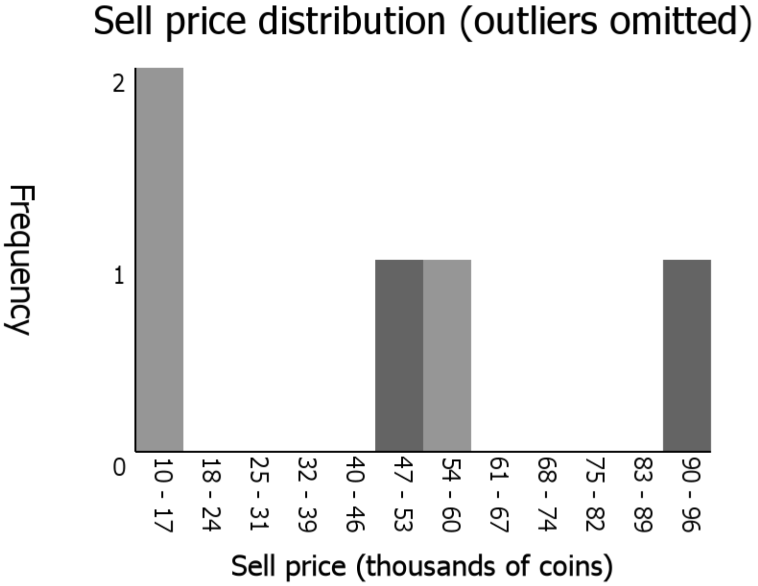
Inputs:
$\bar{x}_1 = 1{,}473.4286$ (coins)
$\bar{x}_2 = 358.6147$ (coins)
$S_1 = 3{,}891.6639$ (coins)
$S_2 = 26.4387$ (coins)
$n_1 = 105$
$n_2 = 6{,}716$

There is significant evidence at the α=0.05 level of significance to support the claim that the mean selling price of a farming talisman is greater than the mean cost of the materials required to make it.

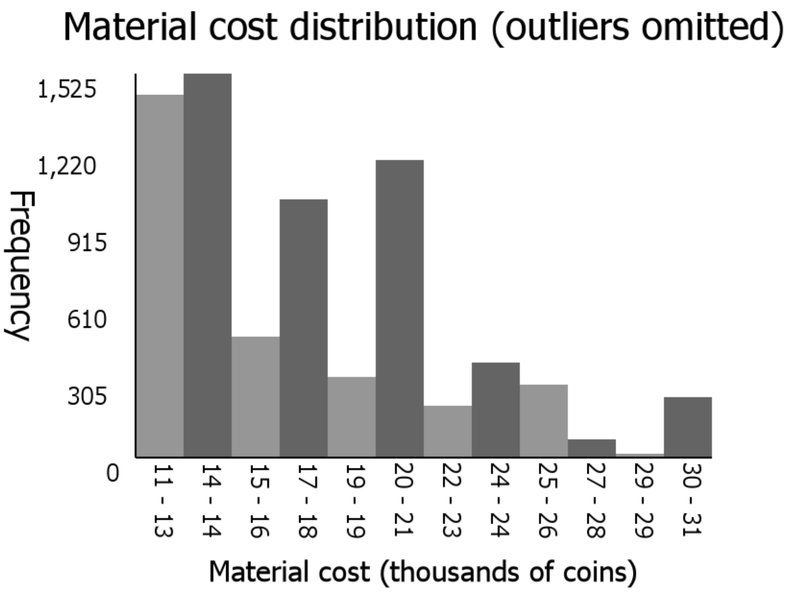
Since we rejected H_o, it suggests that on average people earned more coins from selling this item than it would have cost them to buy the materials.

Implication: the test suggests that on average we could make a profit from flipping this item.

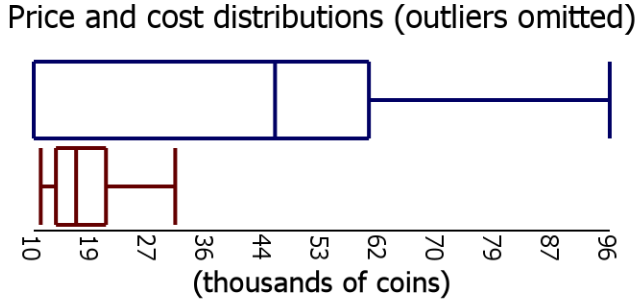
Selling prices and material costs of a challenging rod

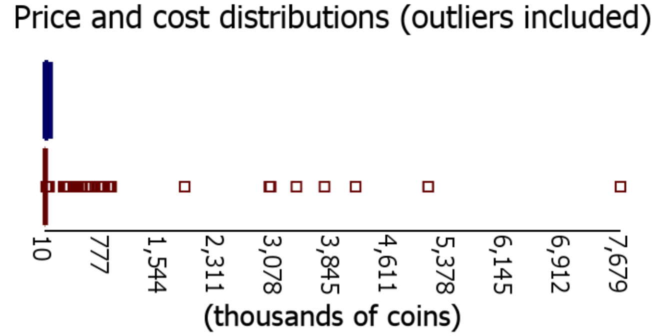


The distribution is centered around 46,000 coins (median). It has a low variability (IQR of 50,000 coins) and is mostly symmetrical. There are large gaps between 17,161 - 45,804 coins and 60,126 - 88,769 coins. There are 0 outliers on the low end and 0 outliers on the high end.



The distribution is centered around 16,324 coins (median). It has a low variability (IQR of 7,465 coins) and is mostly symmetrical. There are no large gaps in the distribution. There are 0 outliers on the low end and 307 outliers on the high end, the highest being 7,679,027 coins.





Key:

Sell Price

Material Cost

5 number summeries (thousands of coins):

min: 10, q1: 10, median: 46, q3: 60, max: 96

min: 11, q1: 13, median: 16, q3: 21, max: 31

Statistical test comparing the selling prices and material costs of a <u>challenging rod</u>

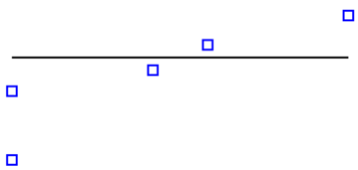
Let group1 = Sell prices of a challenging rod, group2 = Material cost of a challenging rod
X_1 = Sell price of a challenging rod (coins), X_2 = Material cost of a challenging rod (coins)
μ_1 = Mean sell price of a challenging rod (coins), μ_2 = Mean material cost of a challenging rod (coins)

H_o: $\mu_1 = \mu_2$ H_a: $\mu_1 > \mu_2$

<u>Requirements for a difference of means test (σ_1 and σ_2 unknown):</u>

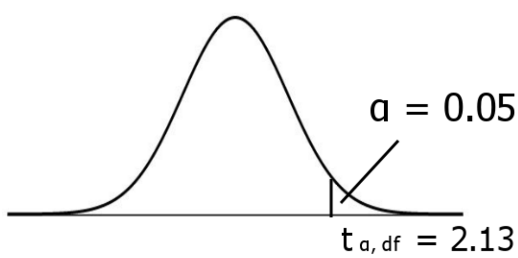
1. 2 independent SRS's: ✓ $n_1 = 5$ $n_2 = 7181$
   One price/cost from either group will not affect any price/cost from either group
2. σ is not known, but S_x is: ✓ S_1 = 36,290.4255 coins S_2 = 4,953.8058 coins
3. Group1 is normally distributed and $n_2 > 30$: ✓

Quantile plot of sell prices



$n_2 = 7181 > 30$

<u>Rejection Critieria:</u>
$\alpha = 0.05$ df = 4



Reject H_o if $t > 2.13$

<u>Test Statistic:</u>

$$t = \frac{(\bar{x}_1 - \bar{x}_2) - (\mu_1 - \mu_2)}{\sqrt{\frac{S_1^2}{N_1} + \frac{S_2^2}{N_2}}}$$

t = 1.68
p-value = 0.0837

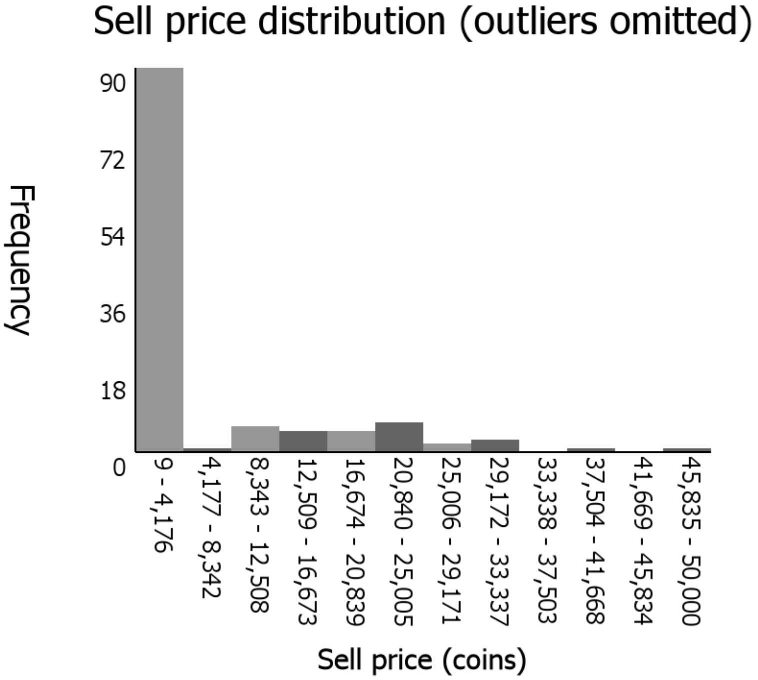
Inputs:
$\bar{x}_1$ = 44,386 (coins)
$\bar{x}_2$ = 17,044.2451 (coins)
S_1 = 36,290.4255 (coins)
S_2 = 4,953.8058 (coins)
n_1 = 5
n_2 = 7,181

Fail to reject H_o since $1.68 < 2.13$

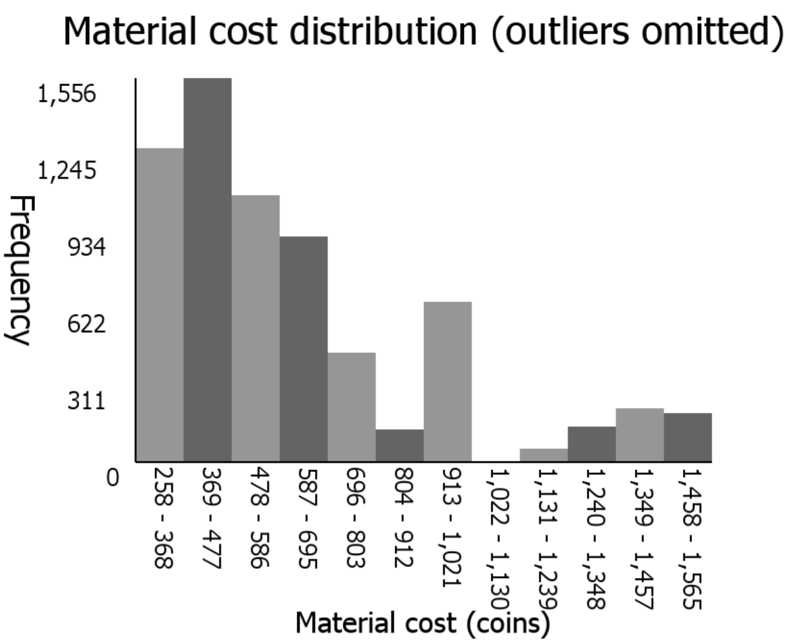
There is not significant evidence at the $\alpha=0.05$ level of significance to support the claim that the mean selling price of a challenging rod is greater than the mean cost of the materials required to make it.

Since we failed to reject H_o, it suggests that on average people did not earn more coins from selling this item than it would have cost them to buy the materials.

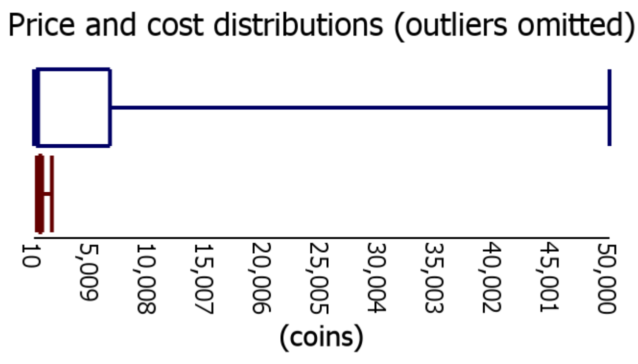
Selling prices and material costs of a feather talisman

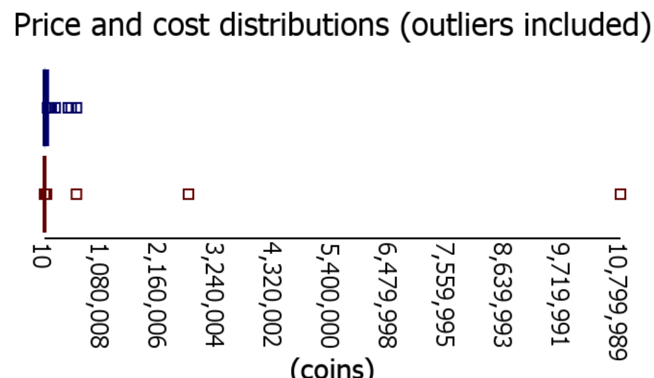


The distribution is centered around 371 coins (median). It has a high variability (IQR of 6,429 coins) and is skewed right. There are large gaps between 33,337 - 37,503 coins and 41,668 - 45,834 coins. There are 0 outliers on the low end and 22 outliers on the high end, the highest being 600,000 coins.



The distribution is centered around 497 coins (median). It has a low variability (IQR of 324 coins) and is skewed right. There is a large gap between 1,021 - 1,130 coins. There are 0 outliers on the low end and 828 outliers on the high end, the highest being 10,799,989 coins.





Key:

Sell Price

Material Cost

5 number summeries (coins):

min: 10, q1: 184, median: 371, q3: 6,613, max: 50,000

min: 259, q1: 400, median: 497, q3: 724, max: 1,565

Statistical test comparing the selling prices and material costs of a feather talisman

Let group1 = Sell prices of a feather talisman, group2 = Material cost of a feather talisman
X_1 = Sell price of a feather talisman (coins), X_2 = Material cost of a feather talisman (coins)
μ_1 = Mean sell price of a feather talisman (coins), μ_2 = Mean material cost of a feather talisman (coins)

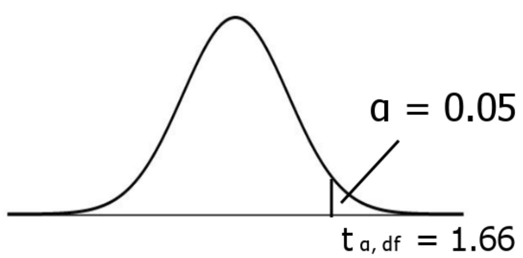
H_o: $\mu_1 = \mu_2$ H_a: $\mu_1 > \mu_2$

Requirements for a difference of means test (σ_1 and σ_2 unknown):

1. 2 independent SRS's: ✓ $n_1 = 121$ $n_2 = 6660$
   One price/cost from either group will not affect any price/cost from either group
2. σ is not known, but S_X is: ✓ $S_1 = 9{,}974.4933$ coins $S_2 = 310.259$ coins
3. $n_1 > 30$ and $n_2 > 30$: ✓ $n_1 = 121 > 30$ $n_2 = 6660 > 30$

Rejection Critieria:

$\alpha = 0.05$ df = 120



Reject H_o if $t > 1.66$

Test Statistic:

$$t = \frac{(\bar{x}_1 - \bar{x}_2) - (\mu_1 - \mu_2)}{\sqrt{\frac{S_1^2}{N_1} + \frac{S_2^2}{N_2}}}$$

Inputs:

$\bar{x}_1 = 5{,}673.9669$ (coins)
$\bar{x}_2 = 622.2312$ (coins)
$S_1 = 9{,}974.4933$ (coins)
$S_2 = 310.259$ (coins)
$n_1 = 121$
$n_2 = 6{,}660$

$t = 5.57$
p-value < 0.0001

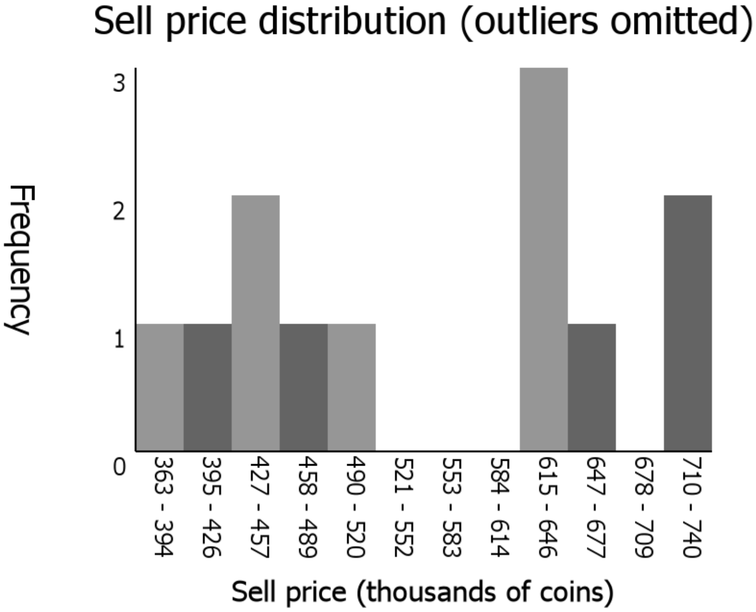
Reject H_o since $5.57 > 1.66$

There is significant evidence at the $\alpha=0.05$ level of significance to support the claim that the mean selling price of a feather talisman is greater than the mean cost of the materials required to make it.

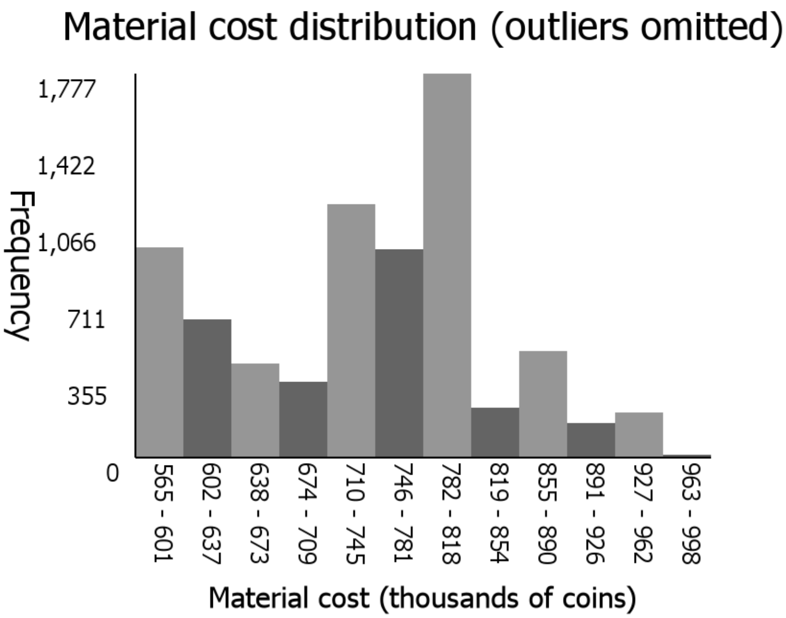
Since we rejected H_o, it suggests that on average people earned more coins from selling this item than it would have cost them to buy the materials.

Implication: the test suggests that on average we could make a profit from flipping this item.

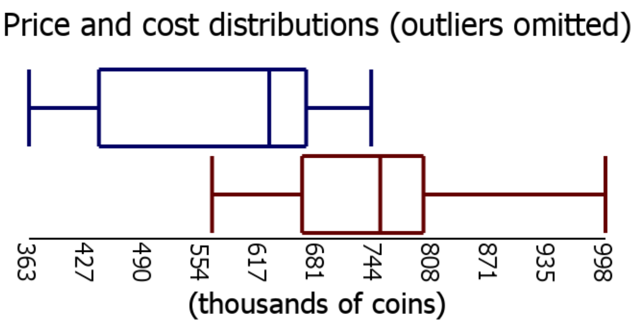
Selling prices and material costs of a strong dragon helmet

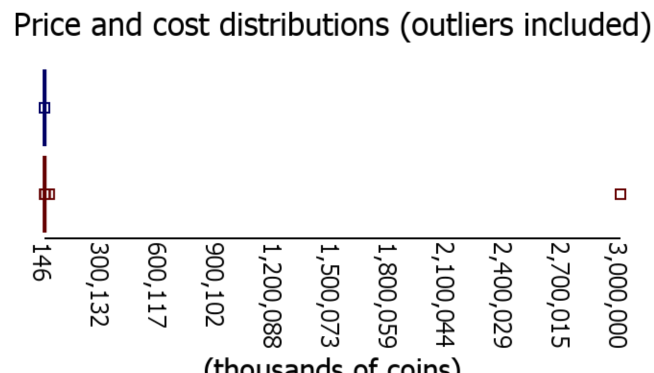


The distribution is centered around 627,685 coins (median). It has a low variability (IQR of 228,362 coins) and is skewed left. There are large gaps between 520,095 - 614,351 coins and 677,189 - 708,608 coins. There are 1 outliers on the low end, the lowest being 146,410 coins and 0 outliers on the high end.



The distribution is centered around 750,000 coins (median). It has a low variability (IQR of 133,702 coins) and is mostly symmetrical. There are no large gaps in the distribution. There are 0 outliers on the low end and 70 outliers on the high end, the highest being 2,999,999,994 coins.





Key:

Sell Price

Material Cost

5 number summeries (thousands of coins):

min: 363, q1: 440, median: 628, q3: 668, max: 740

min: 565, q1: 664, median: 750, q3: 798, max: 998

Statistical test comparing the selling prices and material costs of a strong dragon helmet

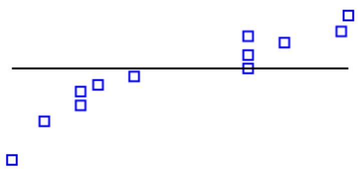
Let group1 = Sell prices of a strong dragon helmet, group2 = Material cost of a strong dragon helmet
X_1 = Sell price of a strong dragon helmet (coins), X_2 = Material cost of a strong dragon helmet (coins)
μ_1 = Mean sell price of a strong dragon helmet (coins), μ_2 = Mean material cost of a strong dragon helmet (coins)

H_o: $\mu_1 = \mu_2$ H_a: $\mu_1 > \mu_2$

Requirements for a difference of means test (σ_1 and σ_2 unknown):

1. 2 independent SRS's: ✓ $n_1 = 12$ $n_2 = 7418$
   One price/cost from either group will not affect any price/cost from either group
2. σ is not known, but S_x is: ✓ S_1 = 132,762.0954 coins S_2 = 94,949.4771 coins
3. Group1 is normally distributed and $n_2 > 30$: ✓

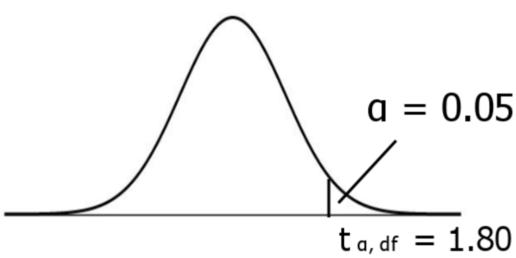
Quantile plot of sell prices



$n_2 = 7418 > 30$

Rejection Critieria:

$\alpha = 0.05$ df = 11



Reject H_o if $t > 1.80$

Test Statistic:

$$t = \frac{(\bar{x}_1 - \bar{x}_2) - (\mu_1 - \mu_2)}{\sqrt{\frac{S_1^2}{N_1} + \frac{S_2^2}{N_2}}}$$

$t = -4.91$
p-value = 0.9998

Inputs:

$\bar{x}_1$ = 552,107.75 (coins)
$\bar{x}_2$ = 740,234.8948 (coins)
S_1 = 132,762.0954 (coins)
S_2 = 94,949.4771 (coins)
$n_1 = 12$
n_2 = 7,418

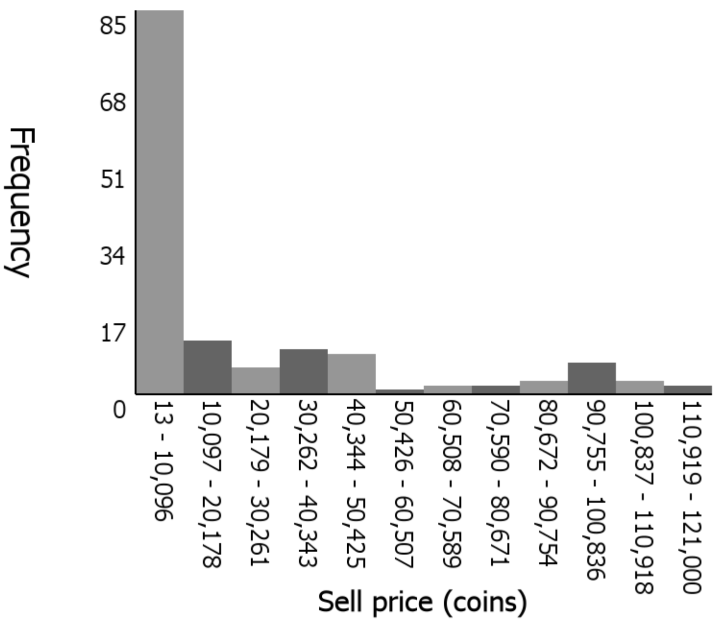
Fail to reject H_o since $-4.91 < 1.80$

There is not significant evidence at the α=0.05 level of significance to support the claim that the mean selling price of a strong dragon helmet is greater than the mean cost of the materials required to make it.

Since we failed to reject H_o, it suggests that on average people did not earn more coins from selling this item than it would have cost them to buy the materials.

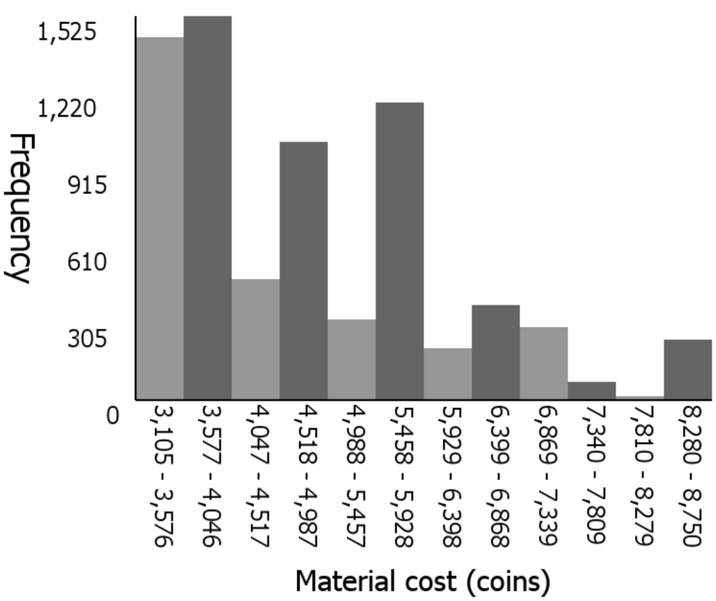
Selling prices and material costs of a healing talisman

Sell price distribution (outliers omitted)



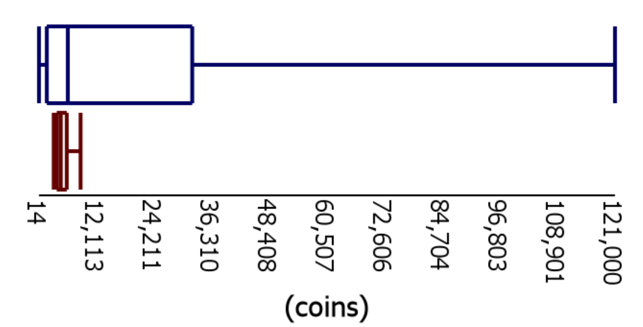
The distribution is centered around 6,072 coins (median). It has a high variability (IQR of 30,544 coins) and is skewed right. There are no large gaps in the distribution. There are 0 outliers on the low end and 17 outliers on the high end, the highest being 2,000,000 coins.

Material cost distribution (outliers omitted)

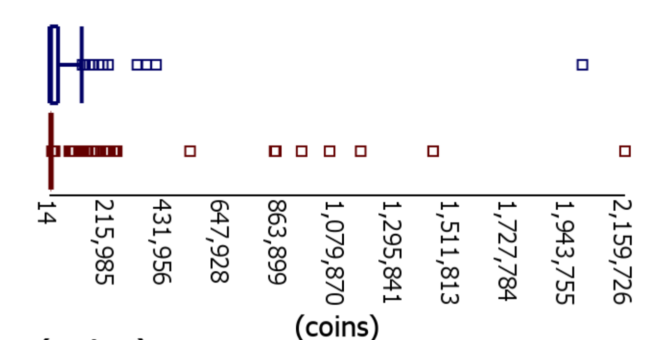


The distribution is centered around 4,591 coins (median). It has a low variability (IQR of 2,100 coins) and is mostly symmetrical. There are no large gaps in the distribution. There are 0 outliers on the low end and 307 outliers on the high end, the highest being 2,159,726 coins.

Price and cost distributions (outliers omitted)



Price and cost distributions (outliers included)



Key:

Sell Price

Material Cost

5 number summeries (coins):

min: 14, q1: 1,656, median: 6,072, q3: 32,200, max: 121,000

min: 3,106, q1: 3,744, median: 4,591, q3: 5,844, max: 8,750

Statistical test comparing the selling prices and material costs of a <u>healing talisman</u>

Let group1 = Sell prices of a healing talisman, group2 = Material cost of a healing talisman
X_1 = Sell price of a healing talisman (coins), X_2 = Material cost of a healing talisman (coins)
μ_1 = Mean sell price of a healing talisman (coins), μ_2 = Mean material cost of a healing talisman (coins)

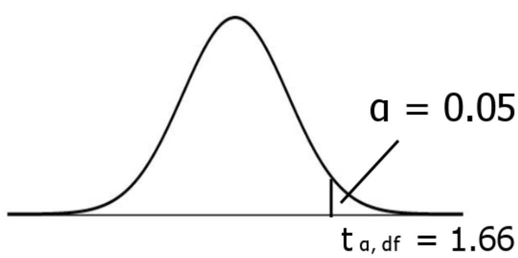
H_o: $\mu_1 = \mu_2$ H_a: $\mu_1 > \mu_2$

<u>Requirements for a difference of means test (σ_1 and σ_2 unknown):</u>

1. 2 independent SRS's: ✓ $n_1 = 142$ $n_2 = 7181$
   One price/cost from either group will not affect any price/cost from either group
2. σ is not known, but S_x is: ✓ S_1 = 31,878.5907 coins S_2 = 1,393.2572 coins
3. $n_1 > 30$ and $n_2 > 30$: ✓ $n_1 = 142 > 30$ $n_2 = 7181 > 30$

<u>Rejection Critieria:</u>

$\alpha = 0.05$ df = 141



Reject H_o if $t > 1.66$

<u>Test Statistic:</u>

$$t = \frac{(\bar{x}_1 - \bar{x}_2) - (\mu_1 - \mu_2)}{\sqrt{\frac{S_1^2}{N_1} + \frac{S_2^2}{N_2}}}$$

$t = 6.80$
p-value < 0.0001

Reject H_o since $6.80 > 1.66$

Inputs:

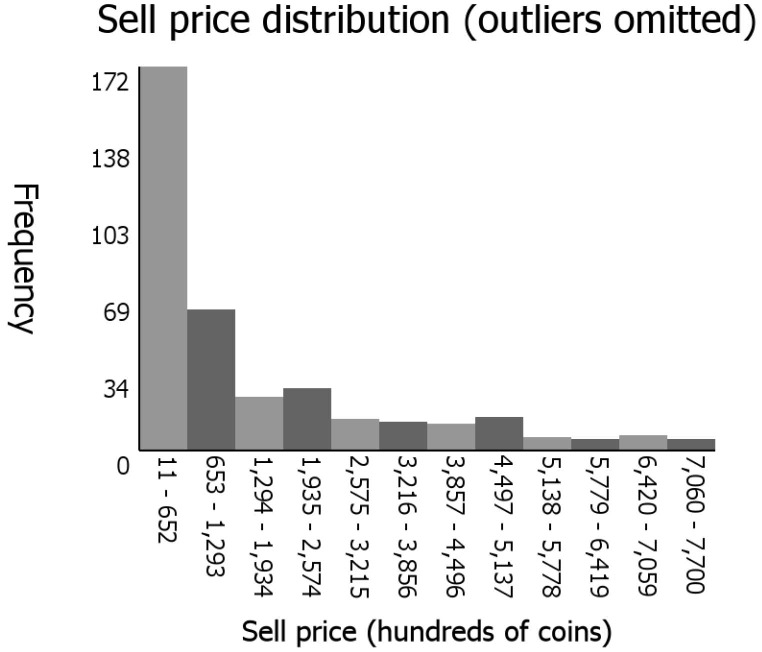
$\bar{x}_1$ = 22,996.1268 (coins)
$\bar{x}_2$ = 4,793.6939 (coins)
S_1 = 31,878.5907 (coins)
S_2 = 1,393.2572 (coins)
$n_1 = 142$
n_2 = 7,181

There is significant evidence at the α=0.05 level of significance to support the claim that the mean selling price of a healing talisman is greater than the mean cost of the materials required to make it.

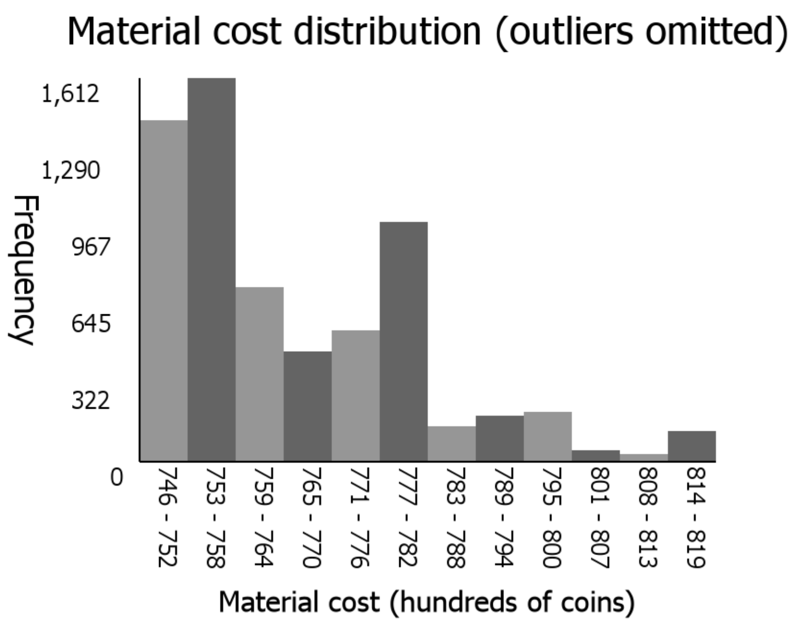
Since we rejected H_o, it suggests that on average people earned more coins from selling this item than it would have cost them to buy the materials.

Implication: the test suggests that on average we could make a profit from flipping this item.

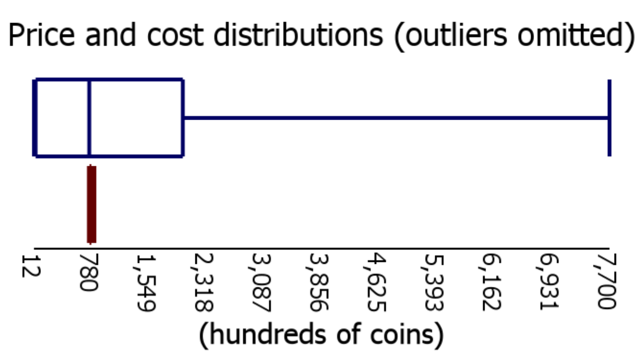
Selling prices and material costs of a farmer orb

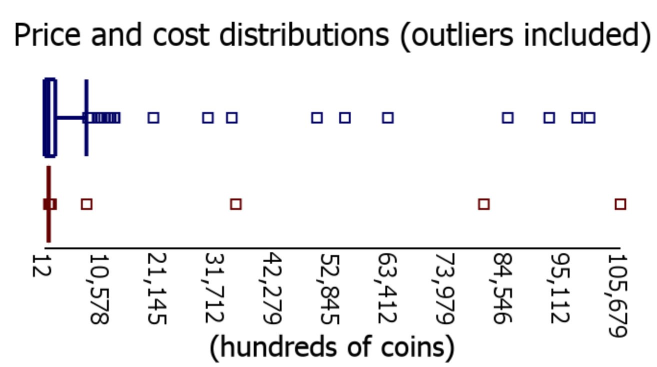


The distribution is centered around 75,000 coins (median). It has a moderate variability (IQR of 196,676 coins) and is skewed right. There are no large gaps in the distribution. There are 0 outliers on the low end and 38 outliers on the high end, the highest being 10,000,000 coins.



The distribution is centered around 75,928 coins (median). It has a low variability (IQR of 2,344 coins) and is mostly symmetrical. There are no large gaps in the distribution. There are 0 outliers on the low end and 913 outliers on the high end, the highest being 10,567,906 coins.





Key:

Sell Price

Material Cost

5 number summeries (hundreds of coins):

min: 12, q1: 33, median: 750, q3: 2,000, max: 7,700

min: 746, q1: 754, median: 759, q3: 777, max: 819

Statistical test comparing the selling prices and material costs of a farmer orb

Let group1 = Sell prices of a farmer orb, group2 = Material cost of a farmer orb
X_1 = Sell price of a farmer orb (coins), X_2 = Material cost of a farmer orb (coins)
μ_1 = Mean sell price of a farmer orb (coins), μ_2 = Mean material cost of a farmer orb (coins)

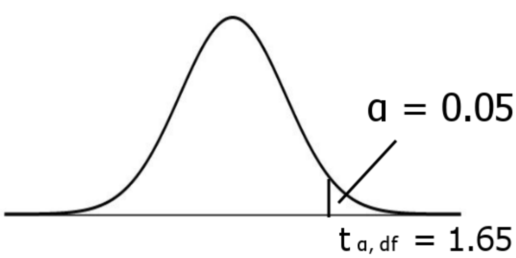
H_o: $\mu_1 = \mu_2$ H_a: $\mu_1 > \mu_2$

Requirements for a difference of means test (σ_1 and σ_2 unknown):

1. 2 independent SRS's: ✓ $n_1 = 364$ $n_2 = 6575$
   One price/cost from either group will not affect any price/cost from either group
2. σ is not known, but S_x is: ✓ S_1 = 185,849.7406 coins S_2 = 1,607.8157 coins
3. $n_1 > 30$ and $n_2 > 30$: ✓ $n_1 = 364 > 30$ $n_2 = 6575 > 30$

Rejection Critieria:

$\alpha = 0.05$ df = 363



Reject H_o if $t > 1.65$

Test Statistic:

$$t = \frac{(\bar{x}_1 - \bar{x}_2) - (\mu_1 - \mu_2)}{\sqrt{\frac{S_1^2}{N_1} + \frac{S_2^2}{N_2}}}$$

$t = 7.13$
p-value < 0.0001

Reject H_o since $7.13 > 1.65$

Inputs:

$\bar{x}_1$ = 146,038.7005 (coins)
$\bar{x}_2$ = 76,546.5 (coins)
S_1 = 185,849.7406 (coins)
S_2 = 1,607.8157 (coins)
n_1 = 364
n_2 = 6,575

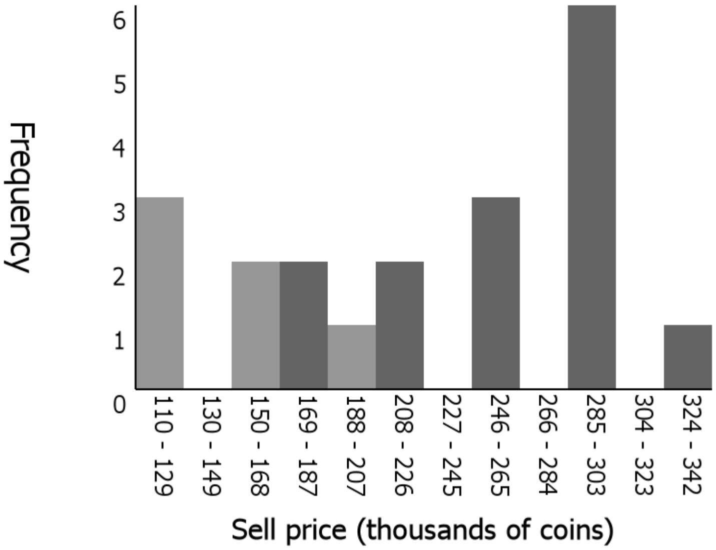
There is significant evidence at the α=0.05 level of significance to support the claim that the mean selling price of a farmer orb is greater than the mean cost of the materials required to make it.

Since we rejected H_o, it suggests that on average people earned more coins from selling this item than it would have cost them to buy the materials.

Implication: the test suggests that on average we could make a profit from flipping this item.

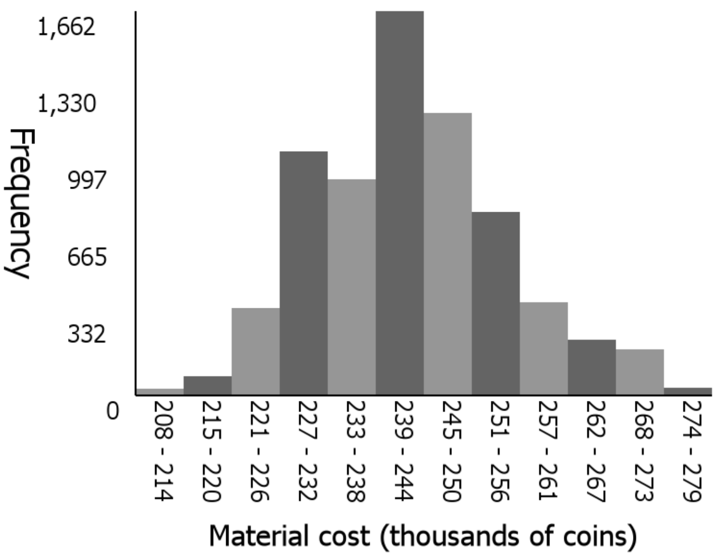
Selling prices and material costs of an unstable dragon boots

Sell price distribution (outliers omitted)



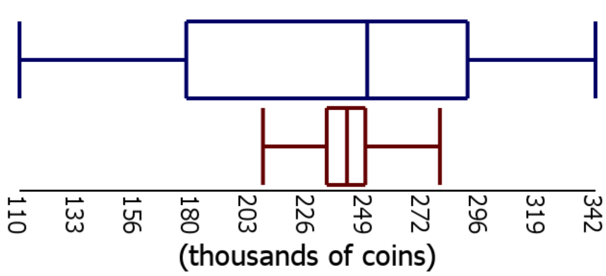
The distribution is centered around 250,000 coins (median). It has a low variability (IQR of 113,244 coins) and is skewed left. There are large gaps between 129,325 - 148,651 coins, 225,953 - 245,278 coins, 264,603 - 283,929 coins, and 303,254 - 322,580 coins. There are 0 outliers on the low end and 0 outliers on the high end.

Material cost distribution (outliers omitted)

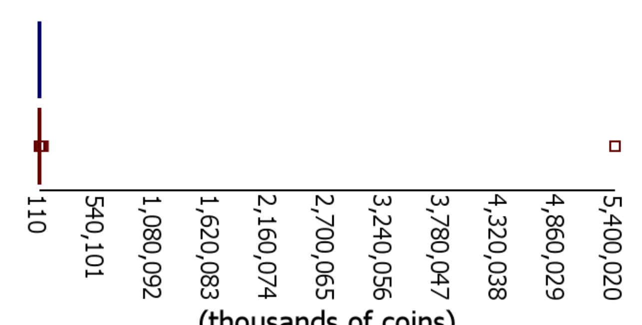


The distribution is centered around 241,862 coins (median). It has a low variability (IQR of 15,546 coins) and is mostly symmetrical. There are no large gaps in the distribution. There are 4 outliers on the low end, the lowest being 169,008 coins and 445 outliers on the high end, the highest being 5,400,020,039 coins.

Price and cost distributions (outliers omitted)



Price and cost distributions (outliers included)



Key:

Sell Price

Material Cost

5 number summeries (thousands of coins):

min: 110, q1: 177, median: 250, q3: 290, max: 342

min: 208, q1: 234, median: 242, q3: 249, max: 279

Statistical test comparing the selling prices and material costs of an unstable dragon boots

Let group1 = Sell prices of an unstable dragon boots, group2 = Material cost of an unstable dragon boots

X_1 = Sell price of an unstable dragon boots (coins), X_2 = Material cost of an unstable dragon boots (coins)

μ_1 = Mean sell price of an unstable dragon boots (coins),

μ_2 = Mean material cost of an unstable dragon boots (coins)

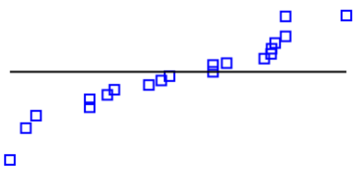
H_o: $\mu_1 = \mu_2$ H_a: $\mu_1 > \mu_2$

Requirements for a difference of means test (σ_1 and σ_2 unknown):

1. 2 independent SRS's: ✓ $n_1 = 20$ $n_2 = 7039$
   One price/cost from either group will not affect any price/cost from either group
2. σ is not known, but S_x is: ✓ S_1 = 68,542.9113 coins S_2 = 11,762.9249 coins
3. Group1 is normally distributed and $n_2 > 30$: ✓

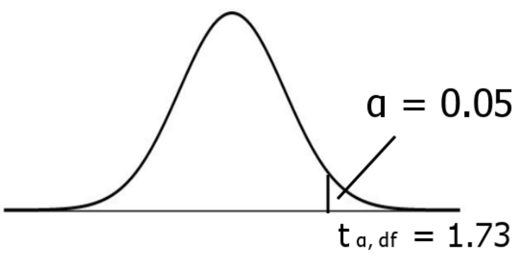
Quantile plot of sell prices

$n_2 = 7039 > 30$



Rejection Critieria:

$\alpha = 0.05$ df = 19



Reject H_o if $t > 1.73$

Test Statistic:

$$t = \frac{(\bar{x}_1 - \bar{x}_2) - (\mu_1 - \mu_2)}{\sqrt{\frac{S_1^2}{N_1} + \frac{S_2^2}{N_2}}}$$

$t = -0.96$

p-value = 0.8266

Inputs:

$\bar{x}_1$ = 227,405.95 (coins)

$\bar{x}_2$ = 242,192.7698 (coins)

S_1 = 68,542.9113 (coins)

S_2 = 11,762.9249 (coins)

$n_1 = 20$

n_2 = 7,039

Fail to reject H_o since $-0.96 < 1.73$

There is not significant evidence at the α=0.05 level of significance to support the claim that the mean selling price of an unstable dragon boots is greater than the mean cost of the materials required to make it.

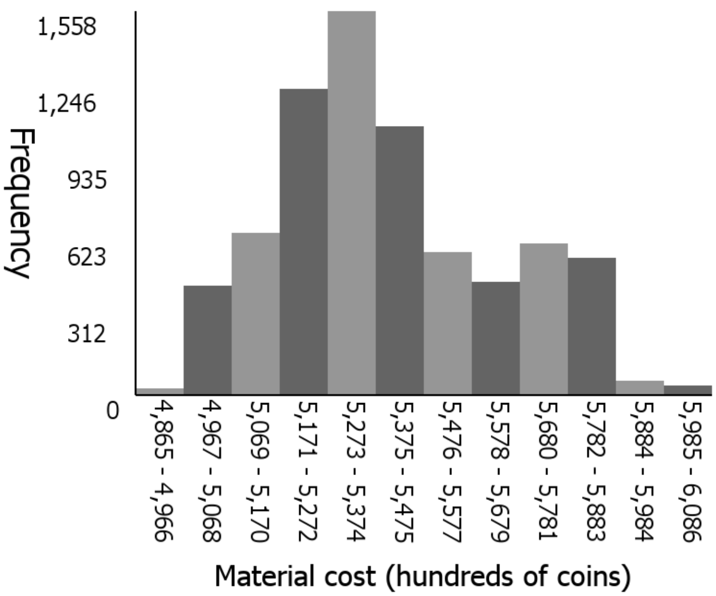
Since we failed to reject H_o, it suggests that on average people did not earn more coins from selling this item than it would have cost them to buy the materials.

Selling prices and material costs of a crystal leggings

Sell price distribution (outliers omitted)

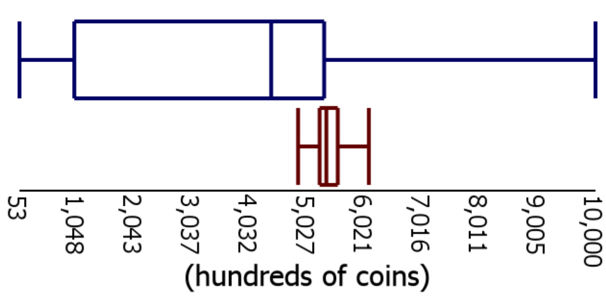
The distribution is centered around 440,000 coins (median). It has a low variability (IQR of 431,468 coins) and is skewed left. There are large gaps between 171,103 - 419,772 coins, 585,551 - 668,441 coins, and 751,331 - 917,110 coins. There are 0 outliers on the low end and 1 outliers on the high end, the highest being 1,690,389 coins.

Material cost distribution (outliers omitted)

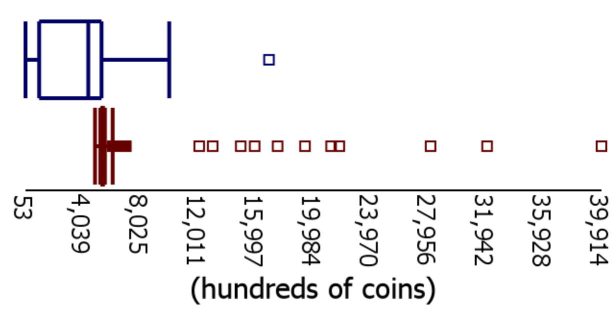


The distribution is centered around 535,235 coins (median). It has a low variability (IQR of 31,327 coins) and is mostly symmetrical. There are no large gaps in the distribution. There are 0 outliers on the low end and 153 outliers on the high end, the highest being 3,991,387 coins.

Price and cost distributions (outliers omitted)



Price and cost distributions (outliers included)



Key:

Sell Price

Material Cost

5 number summeries (hundreds of coins):

min: 53, q1: 1,000, median: 4,400, q3: 5,315, max: 10,000

min: 4,865, q1: 5,236, median: 5,352, q3: 5,549, max: 6,086

Statistical test comparing the selling prices and material costs of a crystal leggings

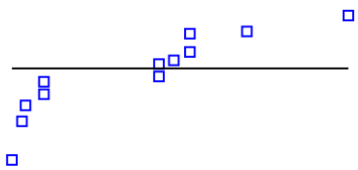
Let group1 = Sell prices of a crystal leggings, group2 = Material cost of a crystal leggings
X_1 = Sell price of a crystal leggings (coins), X_2 = Material cost of a crystal leggings (coins)
μ_1 = Mean sell price of a crystal leggings (coins), μ_2 = Mean material cost of a crystal leggings (coins)

H_o: $\mu_1 = \mu_2$ H_a: $\mu_1 > \mu_2$

Requirements for a difference of means test (σ_1 and σ_2 unknown):

1. 2 independent SRS's: ✓ $n_1 = 12$ $n_2 = 7335$
   One price/cost from either group will not affect any price/cost from either group
2. σ is not known, but S_x is: ✓ S_1 = 312,884.6416 coins S_2 = 23,821.4807 coins
3. Group1 is normally distributed and $n_2 > 30$: ✓

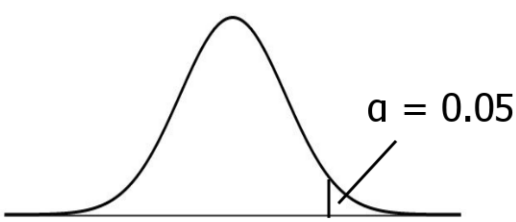
Quantile plot of sell prices



$n_2 = 7335 > 30$

Rejection Critieria:

α = 0.05 df = 11



$t_{\alpha, df}$ = 1.80

Reject H_o if t > 1.80

Test Statistic:

$$t = \frac{(\bar{x}_1 - \bar{x}_2) - (\mu_1 - \mu_2)}{\sqrt{\frac{S_1^2}{N_1} + \frac{S_2^2}{N_2}}}$$

t = -1.91
p-value = 0.9586

Inputs:

$\bar{x}_1$ = 367,746.25 (coins)
$\bar{x}_2$ = 540,075.6015 (coins)
S_1 = 312,884.6416 (coins)
S_2 = 23,821.4807 (coins)
n_1 = 12
n_2 = 7,335

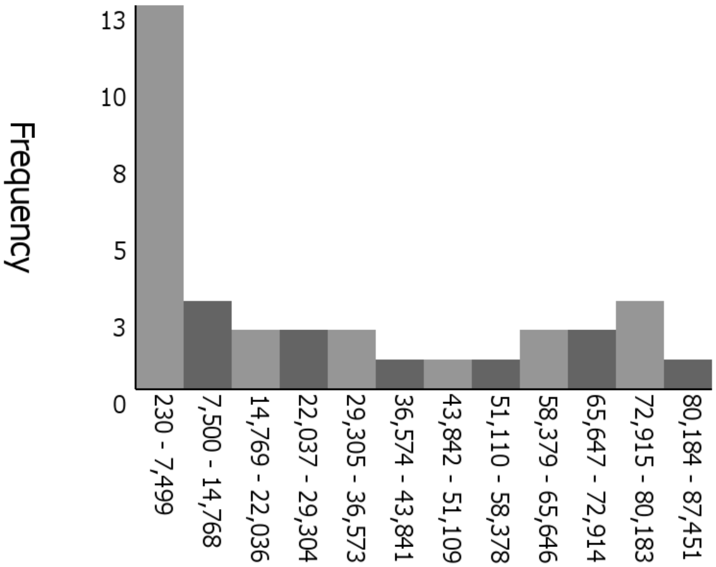
Fail to reject H_o since -1.91 < 1.80

There is not significant evidence at the α=0.05 level of significance to support the claim that the mean selling price of a crystal leggings is greater than the mean cost of the materials required to make it.

Since we failed to reject H_o, it suggests that on average people did not earn more coins from selling this item than it would have cost them to buy the materials.

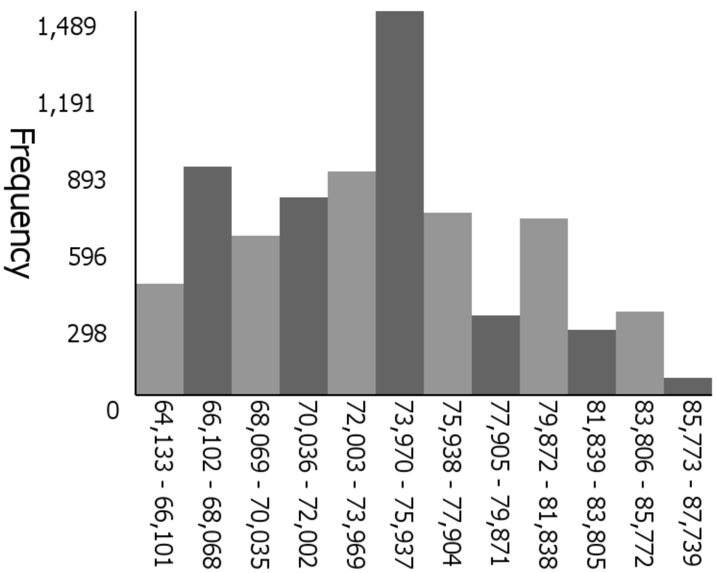
Selling prices and material costs of a farm armor chestplate

Sell price distribution (outliers omitted)



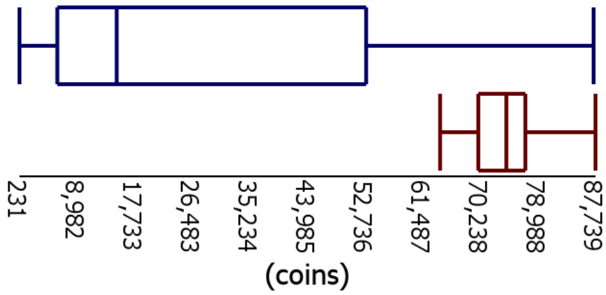
The distribution is centered around 15,000 coins (median). It has a high variability (IQR of 46,920 coins) and is skewed right. There are no large gaps in the distribution. There are 0 outliers on the low end and 0 outliers on the high end.

Material cost distribution (outliers omitted)

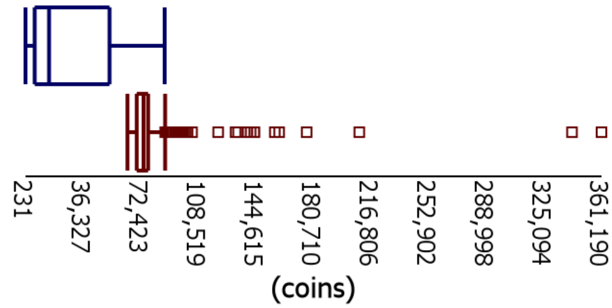


The distribution is centered around 74,200 coins (median). It has a low variability (IQR of 7,149 coins) and is mostly symmetrical. There are no large gaps in the distribution. There are 0 outliers on the low end and 89 outliers on the high end, the highest being 361,190 coins.

Price and cost distributions (outliers omitted)



Price and cost distributions (outliers included)



Key:

Sell Price

Material Cost

5 number summeries (coins):

min: 231, q1: 5,980, median: 15,000, q3: 52,900, max: 87,451

min: 64,134, q1: 69,936, median: 74,200, q3: 77,085, max: 87,739

Statistical test comparing the selling prices and material costs of a <u>farm armor chestplate</u>

Let group1 = Sell prices of a farm armor chestplate, group2 = Material cost of a farm armor chestplate
X_1 = Sell price of a farm armor chestplate (coins), X_2 = Material cost of a farm armor chestplate (coins)
μ_1 = Mean sell price of a farm armor chestplate (coins), μ_2 = Mean material cost of a farm armor chestplate (coins)

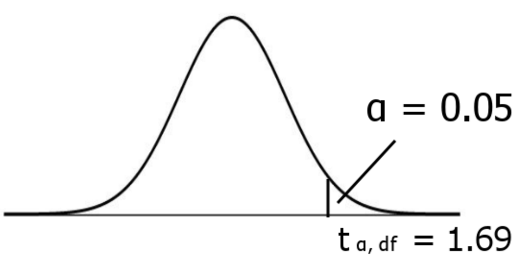
H_o: $\mu_1 = \mu_2$ H_a: $\mu_1 > \mu_2$

<u>Requirements for a difference of means test (σ_1 and σ_2 unknown):</u>

1. 2 independent SRS's: ✓ $n_1 = 33$ $n_2 = 7399$
   One price/cost from either group will not affect any price/cost from either group
2. σ is not known, but S_x is: ✓ S_1 = 28,315.5764 coins S_2 = 5,391.8232 coins
3. $n_1 > 30$ and $n_2 > 30$: ✓ $n_1 = 33 > 30$ $n_2 = 7399 > 30$

<u>Rejection Critieria:</u>

$\alpha = 0.05$ df = 32



Reject H_o if $t > 1.69$

<u>Test Statistic:</u>

$$t = \frac{(\bar{x}_1 - \bar{x}_2) - (\mu_1 - \mu_2)}{\sqrt{\frac{S_1^2}{N_1} + \frac{S_2^2}{N_2}}}$$

$t = -8.97$
p-value > 0.9999

Inputs:

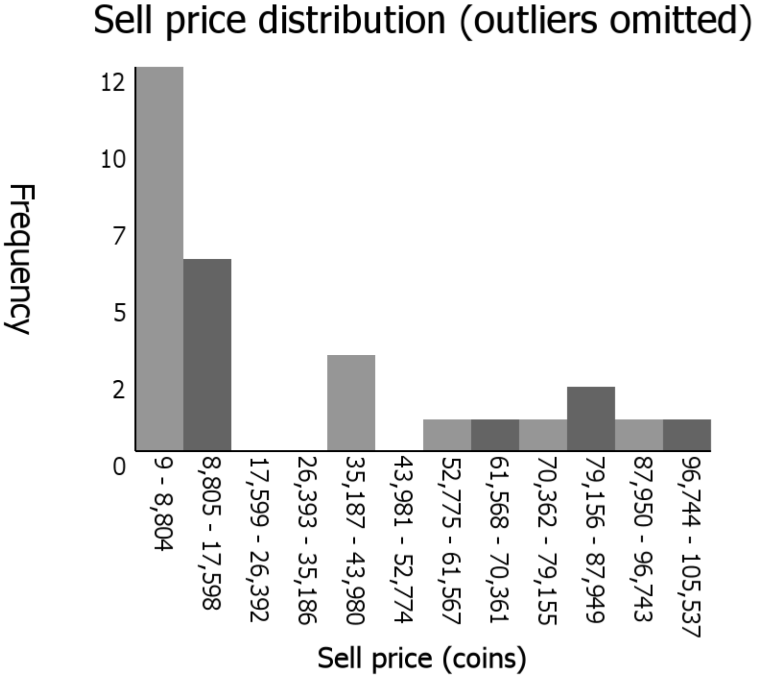
$\bar{x}_1$ = 29,775.9697 (coins)
$\bar{x}_2$ = 73,997.2627 (coins)
S_1 = 28,315.5764 (coins)
S_2 = 5,391.8232 (coins)
n_1 = 33
n_2 = 7,399

Fail to reject H_o since $-8.97 < 1.69$

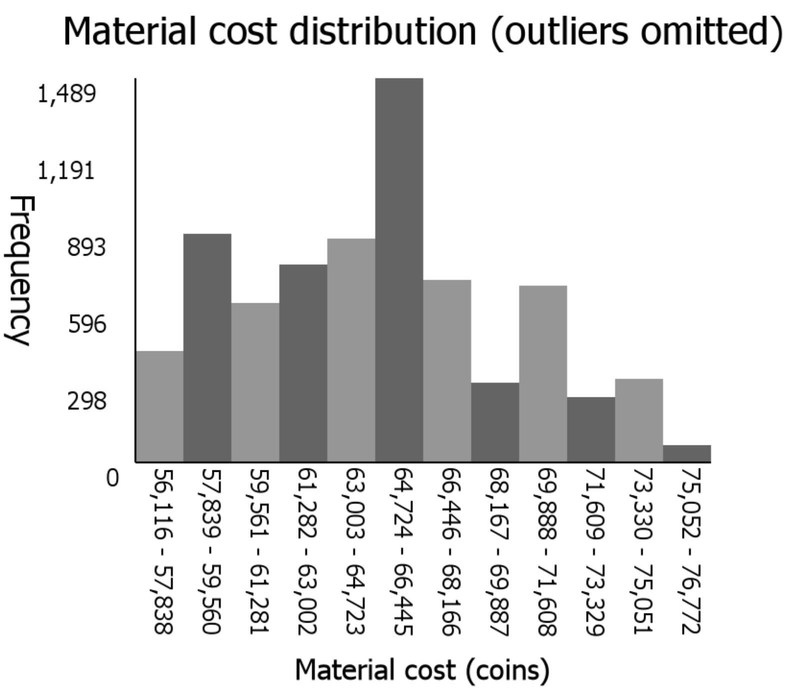
There is not significant evidence at the α=0.05 level of significance to support the claim that the mean selling price of a farm armor chestplate is greater than the mean cost of the materials required to make it.

Since we failed to reject H_o, it suggests that on average people did not earn more coins from selling this item than it would have cost them to buy the materials.

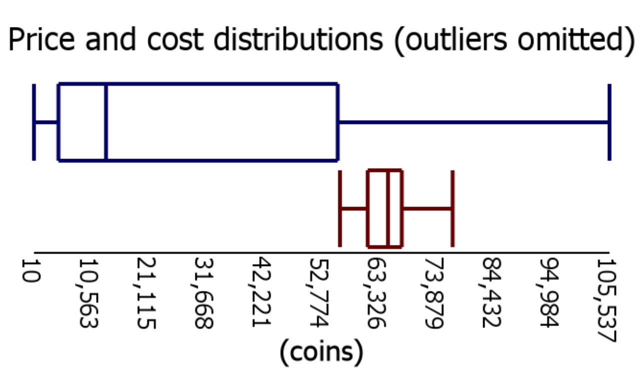
Selling prices and material costs of a farm armor leggings

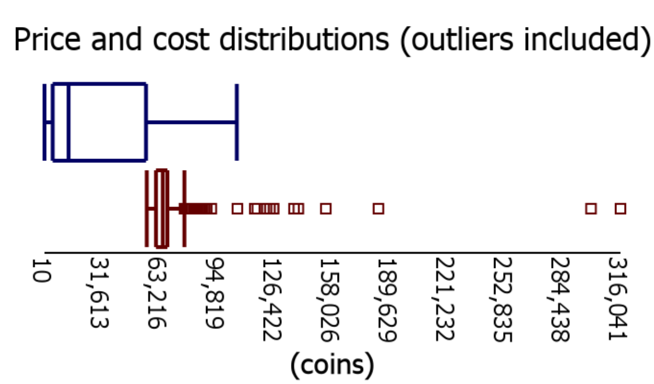


The distribution is centered around 13,225 coins (median). It has a high variability (IQR of 51,198 coins) and is skewed right. There are large gaps between 17,598 - 35,186 coins and 43,980 - 52,774 coins. There are 0 outliers on the low end and 0 outliers on the high end.



The distribution is centered around 64,925 coins (median). It has a low variability (IQR of 6,255 coins) and is mostly symmetrical. There are no large gaps in the distribution. There are 0 outliers on the low end and 89 outliers on the high end, the highest being 316,041 coins.





Key:

Sell Price

Material Cost

5 number summeries (coins):

min: 10, q1: 4,500, median: 13,225, q3: 55,698, max: 105,537

min: 56,117, q1: 61,194, median: 64,925, q3: 67,449, max: 76,772

Statistical test comparing the selling prices and material costs of a <u>farm armor leggings</u>

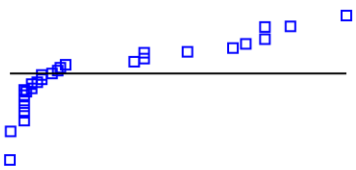
Let group1 = Sell prices of a farm armor leggings, group2 = Material cost of a farm armor leggings
X_1 = Sell price of a farm armor leggings (coins), X_2 = Material cost of a farm armor leggings (coins)
μ_1 = Mean sell price of a farm armor leggings (coins), μ_2 = Mean material cost of a farm armor leggings (coins)

$H_o: \mu_1 = \mu_2 \quad H_a: \mu_1 > \mu_2$

<u>Requirements for a difference of means test (σ_1 and σ_2 unknown):</u>

1. 2 independent SRS's: ✓ $n_1 = 28$ $n_2 = 7399$
   One price/cost from either group will not affect any price/cost from either group
2. σ is not known, but S_x is: ✓ $S_1 = 32{,}265.4394$ coins $S_2 = 4{,}717.8456$ coins
3. Group1 is normally distributed and $n_2 > 30$: ✓

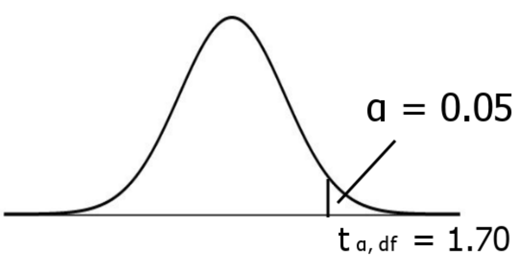
Quantile plot of sell prices



$n_2 = 7399 > 30$

<u>Rejection Critieria:</u>

$\alpha = 0.05$ df = 27



Reject H_o if $t > 1.70$

<u>Test Statistic:</u>

$$t = \frac{(\bar{x}_1 - \bar{x}_2) - (\mu_1 - \mu_2)}{\sqrt{\frac{S_1^2}{N_1} + \frac{S_2^2}{N_2}}}$$

$t = -5.86$
p-value > 0.9999

Inputs:

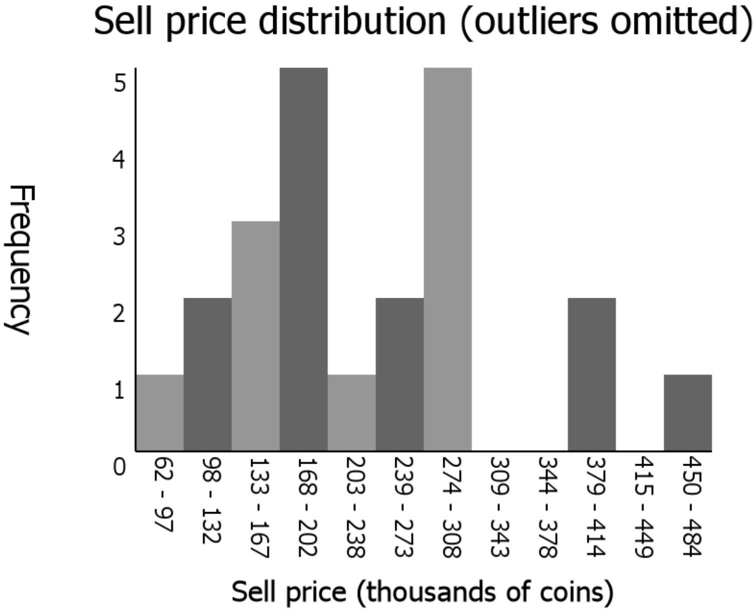
$\bar{x}_1 = 29{,}024.0357$ (coins)
$\bar{x}_2 = 64{,}747.6056$ (coins)
$S_1 = 32{,}265.4394$ (coins)
$S_2 = 4{,}717.8456$ (coins)
$n_1 = 28$
$n_2 = 7{,}399$

Fail to reject H_o since $-5.86 < 1.70$

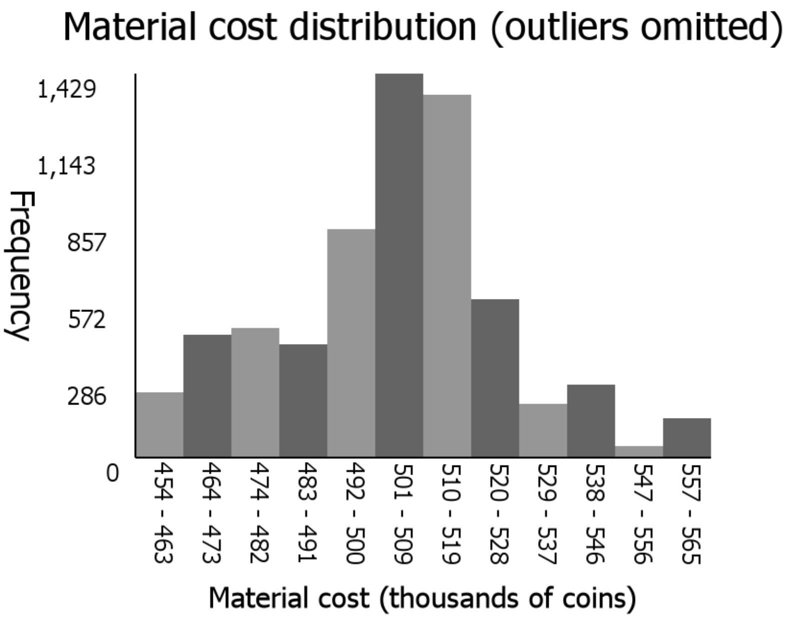
There is not significant evidence at the α=0.05 level of significance to support the claim that the mean selling price of a farm armor leggings is greater than the mean cost of the materials required to make it.

Since we failed to reject H_o, it suggests that on average people did not earn more coins from selling this item than it would have cost them to buy the materials.

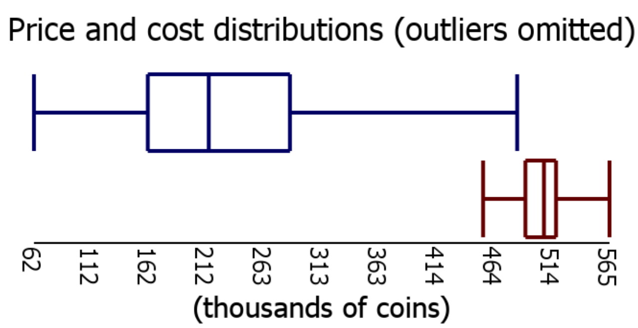
Selling prices and material costs of an old dragon chestplate

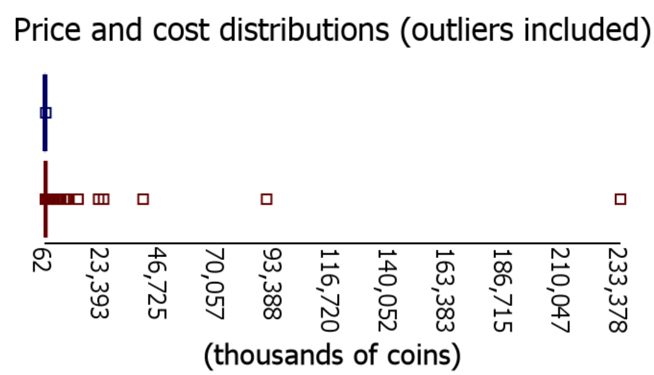


The distribution is centered around 214,359 coins (median). It has a low variability (IQR of 124,262 coins) and is skewed right. There are large gaps between 307,971 - 378,383 coins and 413,589 - 448,794 coins. There are 0 outliers on the low end and 1 outliers on the high end, the highest being 600,000 coins.



The distribution is centered around 507,407 coins (median). It has a low variability (IQR of 26,784 coins) and is mostly symmetrical. There are no large gaps in the distribution. There are 48 outliers on the low end, the lowest being 431,920 coins and 951 outliers on the high end, the highest being 233,378,434 coins.





Key:

Sell Price

Material Cost

5 number summeries (thousands of coins):

min: 62, q1: 161, median: 214, q3: 285, max: 484

min: 454, q1: 491, median: 507, q3: 518, max: 565

Statistical test comparing the selling prices and material costs of an <u>old dragon chestplate</u>

Let group1 = Sell prices of an old dragon chestplate, group2 = Material cost of an old dragon chestplate

X_1 = Sell price of an old dragon chestplate (coins), X_2 = Material cost of an old dragon chestplate (coins)

μ_1 = Mean sell price of an old dragon chestplate (coins),

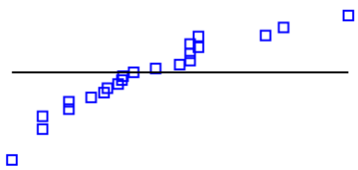
μ_2 = Mean material cost of an old dragon chestplate (coins)

H_o: $\mu_1 = \mu_2$ H_a: $\mu_1 > \mu_2$

<u>Requirements for a difference of means test (σ_1 and σ_2 unknown):</u>

1. 2 independent SRS's: ✓ $n_1 = 22$ $n_2 = 6489$
   One price/cost from either group will not affect any price/cost from either group
2. σ is not known, but S_x is: ✓ S_1 = 104,799.8104 coins S_2 = 21,478.6024 coins
3. Group1 is normally distributed and $n_2 > 30$: ✓

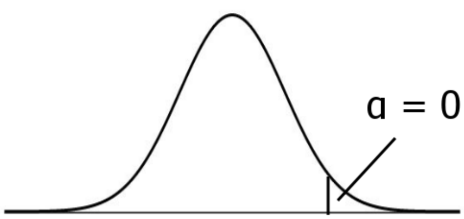
Quantile plot of sell prices



$n_2 = 6489 > 30$

<u>Rejection Critieria:</u>

$\alpha = 0.05$ df = 21



Reject H_o if $t > 1.72$

<u>Test Statistic:</u>

$$t = \frac{(\bar{x}_1 - \bar{x}_2) - (\mu_1 - \mu_2)}{\sqrt{\frac{S_1^2}{N_1} + \frac{S_2^2}{N_2}}}$$

$t = -12.22$

p-value > 0.9999

Inputs:

$\bar{x}_1$ = 231,165.0909 (coins)

$\bar{x}_2$ = 504,183.2544 (coins)

S_1 = 104,799.8104 (coins)

S_2 = 21,478.6024 (coins)

$n_1 = 22$

n_2 = 6,489

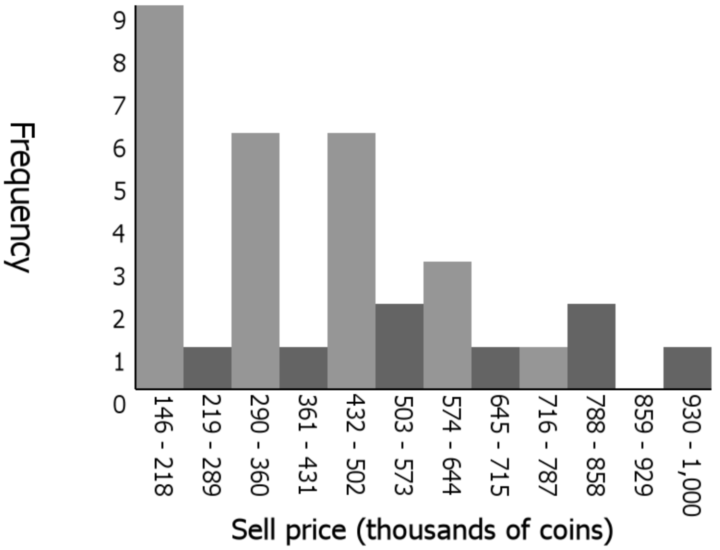
Fail to reject H_o since $-12.22 < 1.72$

There is not significant evidence at the α=0.05 level of significance to support the claim that the mean selling price of an old dragon chestplate is greater than the mean cost of the materials required to make it.

Since we failed to reject H_o, it suggests that on average people did not earn more coins from selling this item than it would have cost them to buy the materials.

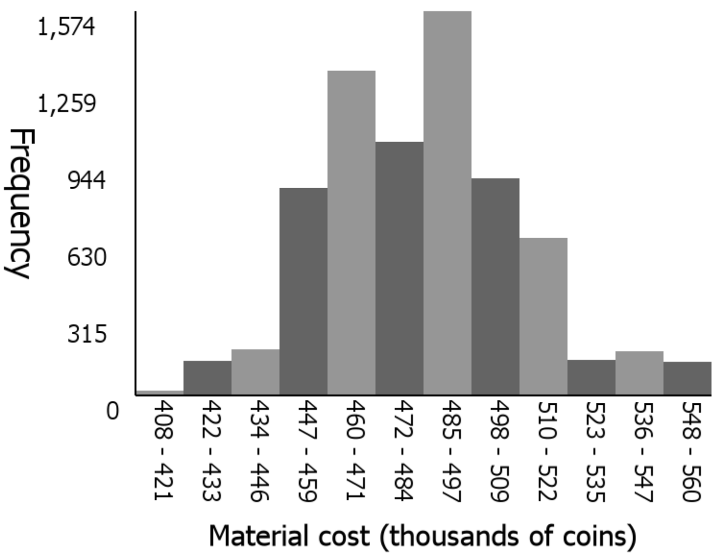
Selling prices and material costs of a young dragon chestplate

Sell price distribution (outliers omitted)



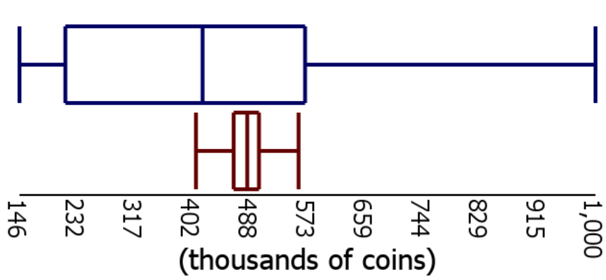
The distribution is centered around 417,726 coins (median). It has a low variability (IQR of 355,268 coins) and is mostly symmetrical. There is a large gap between 857,735 - 928,868 coins. There are 0 outliers on the low end and 3 outliers on the high end, the highest being 550,000,000 coins.

Material cost distribution (outliers omitted)

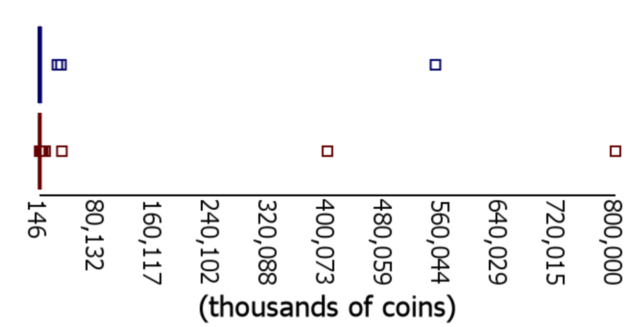


The distribution is centered around 483,952 coins (median). It has a low variability (IQR of 37,480 coins) and is mostly symmetrical. There are no large gaps in the distribution. There are 3 outliers on the low end, the lowest being 406,734 coins and 345 outliers on the high end, the highest being 799,999,896 coins.

Price and cost distributions (outliers omitted)



Price and cost distributions (outliers included)



Key:

Sell Price

Material Cost

5 number summeries (thousands of coins):

min: 146, q1: 214, median: 418, q3: 570, max: 1,000

min: 408, q1: 464, median: 484, q3: 501, max: 560

Statistical test comparing the selling prices and material costs of a young dragon chestplate

Let group1 = Sell prices of a young dragon chestplate, group2 = Material cost of a young dragon chestplate

X_1 = Sell price of a young dragon chestplate (coins), X_2 = Material cost of a young dragon chestplate (coins)

μ_1 = Mean sell price of a young dragon chestplate (coins),

μ_2 = Mean material cost of a young dragon chestplate (coins)

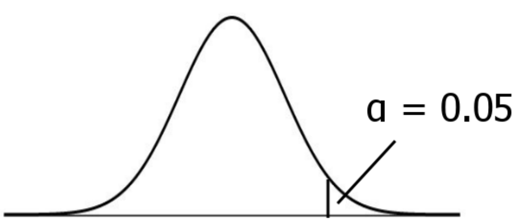
$H_o: \mu_1 = \mu_2 \quad H_a: \mu_1 > \mu_2$

Requirements for a difference of means test (σ_1 and σ_2 unknown):

1. 2 independent SRS's: ✓ $n_1 = 33$ $n_2 = 7140$
   One price/cost from either group will not affect any price/cost from either group
2. σ is not known, but S_x is: ✓ S_1 = 224,082.9861 coins S_2 = 25,882.599 coins
3. $n_1 > 30$ and $n_2 > 30$: ✓ $n_1 = 33 > 30$ $n_2 = 7140 > 30$

Rejection Critieria:

$\alpha = 0.05$ df = 32



Reject H_o if $t > 1.69$

Test Statistic:

$$t = \frac{(\bar{x}_1 - \bar{x}_2) - (\mu_1 - \mu_2)}{\sqrt{\frac{S_1^2}{N_1} + \frac{S_2^2}{N_2}}}$$

$t = -1.51$

p-value = 0.9293

Inputs:

$\bar{x}_1$ = 425,129.1515 (coins)
$\bar{x}_2$ = 483,949.9449 (coins)
S_1 = 224,082.9861 (coins)
S_2 = 25,882.599 (coins)
n_1 = 33
n_2 = 7,140

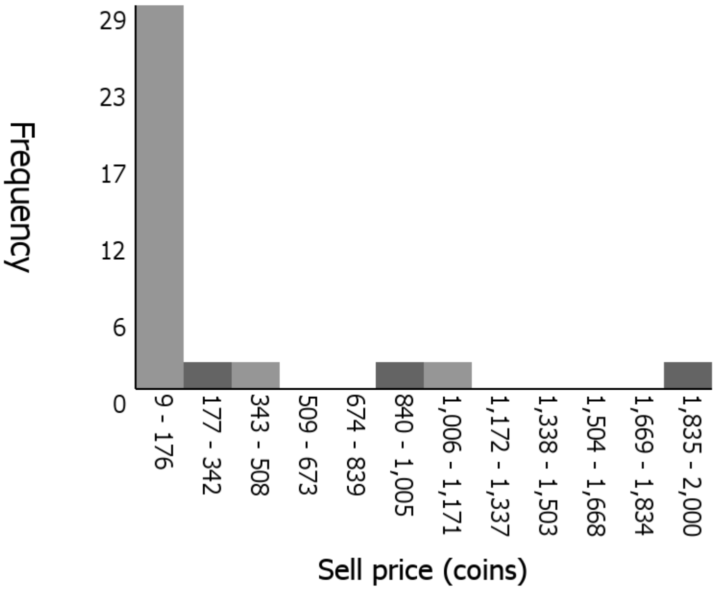
Fail to reject H_o since $-1.51 < 1.69$

There is not significant evidence at the α=0.05 level of significance to support the claim that the mean selling price of a young dragon chestplate is greater than the mean cost of the materials required to make it.

Since we failed to reject H_o, it suggests that on average people did not earn more coins from selling this item than it would have cost them to buy the materials.

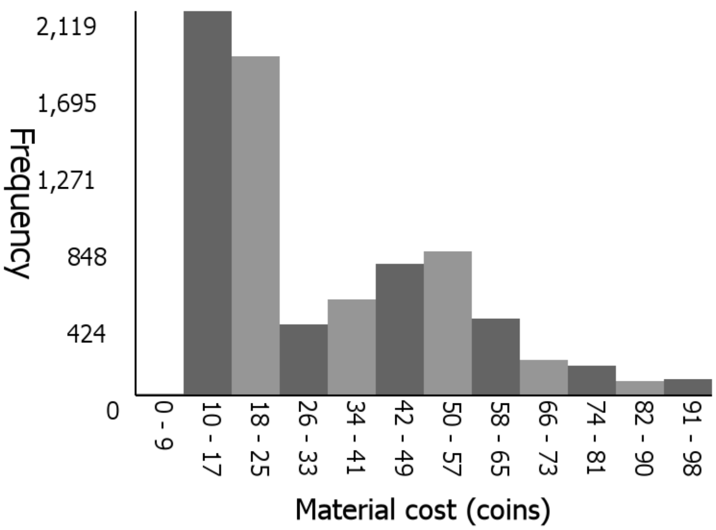
Selling prices and material costs of an end sword

Sell price distribution (outliers omitted)



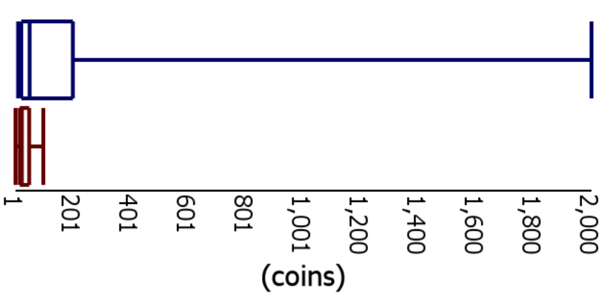
The distribution is centered around 50 coins (median). It has a high variability (IQR of 179 coins) and is skewed right. There are large gaps between 508 - 839 coins and 1,171 - 1,834 coins. There are 0 outliers on the low end and 7 outliers on the high end, the highest being 1,500,000 coins.

Material cost distribution (outliers omitted)

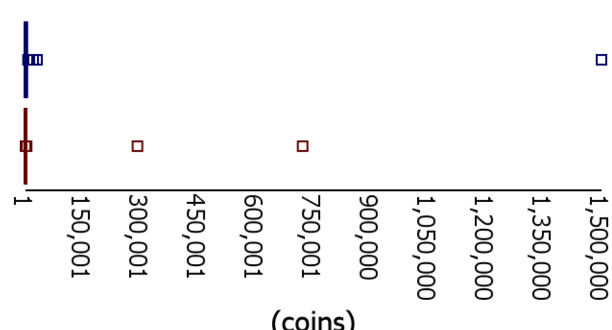


The distribution is centered around 23 coins (median). It has a low variability (IQR of 33 coins) and is skewed right. There are no large gaps in the distribution. There are 0 outliers on the low end and 90 outliers on the high end, the highest being 721,728 coins.

Price and cost distributions (outliers omitted)



Price and cost distributions (outliers included)



Key:

Sell Price

Material Cost

5 number summeries (coins):

min: 10, q1: 21, median: 50, q3: 200, max: 2,000

min: 1, q1: 16, median: 23, q3: 49, max: 98

Statistical test comparing the selling prices and material costs of an end sword

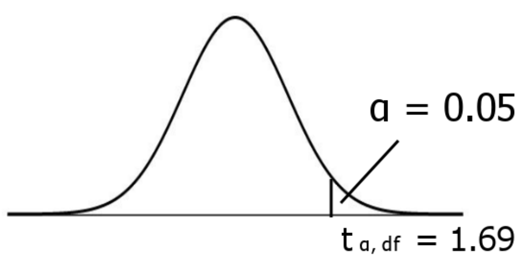
Let group1 = Sell prices of an end sword, group2 = Material cost of an end sword
X_1 = Sell price of an end sword (coins), X_2 = Material cost of an end sword (coins)
μ_1 = Mean sell price of an end sword (coins), μ_2 = Mean material cost of an end sword (coins)

$H_o: \mu_1 = \mu_2 \quad H_a: \mu_1 > \mu_2$

Requirements for a difference of means test (σ_1 and σ_2 unknown):

1. 2 independent SRS's: ✓ $n_1 = 39$ $n_2 = 7398$
   One price/cost from either group will not affect any price/cost from either group
2. σ is not known, but S_x is: ✓ $S_1 = 518.6944$ coins $S_2 = 20.0448$ coins
3. $n_1 > 30$ and $n_2 > 30$: ✓ $n_1 = 39 > 30$ $n_2 = 7398 > 30$

Rejection Critieria:
$\alpha = 0.05$ df = 38



Reject H_o if $t > 1.69$

Test Statistic:

$$t = \frac{(\bar{x}_1 - \bar{x}_2) - (\mu_1 - \mu_2)}{\sqrt{\frac{S_1^2}{N_1} + \frac{S_2^2}{N_2}}}$$

Inputs:
$\bar{x}_1 = 274.8718$ (coins)
$\bar{x}_2 = 32.7464$ (coins)
$S_1 = 518.6944$ (coins)
$S_2 = 20.0448$ (coins)
$n_1 = 39$
$n_2 = 7{,}398$

$t = 2.92$
p-value = 0.0030

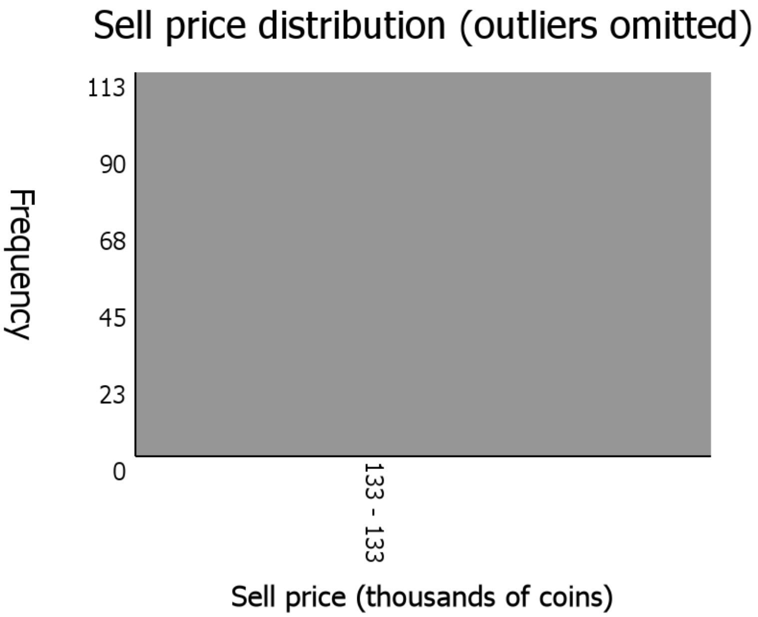
Reject H_o since $2.92 > 1.69$

There is significant evidence at the α=0.05 level of significance to support the claim that the mean selling price of an end sword is greater than the mean cost of the materials required to make it.

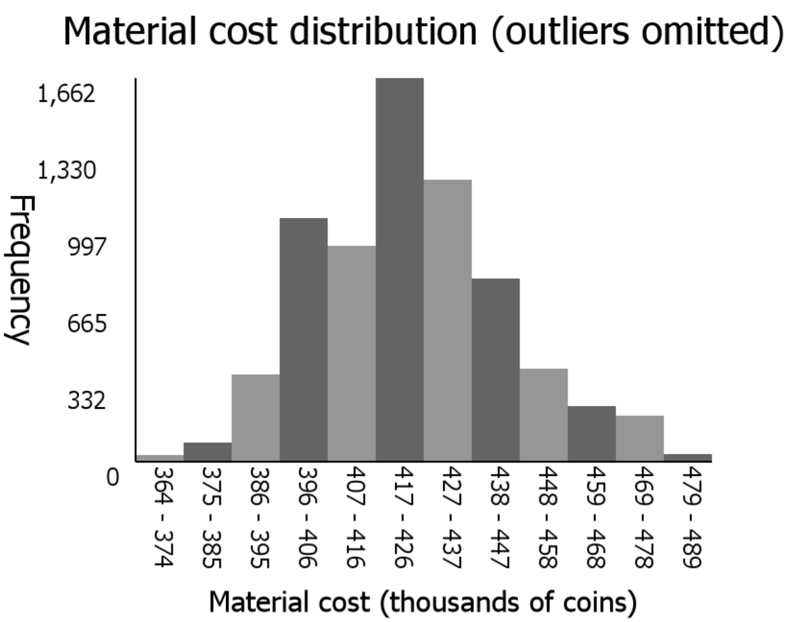
Since we rejected H_o, it suggests that on average people earned more coins from selling this item than it would have cost them to buy the materials.

Implication: the test suggests that on average we could make a profit from flipping this item.

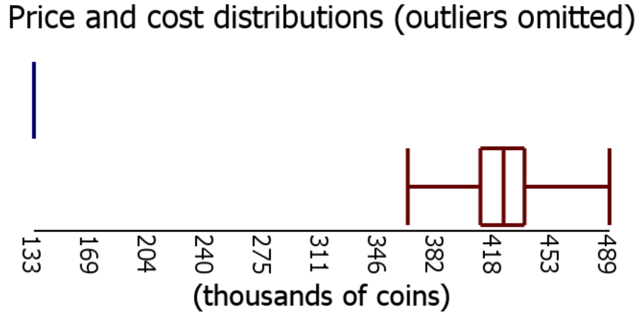
Selling prices and material costs of an unstable dragon leggings

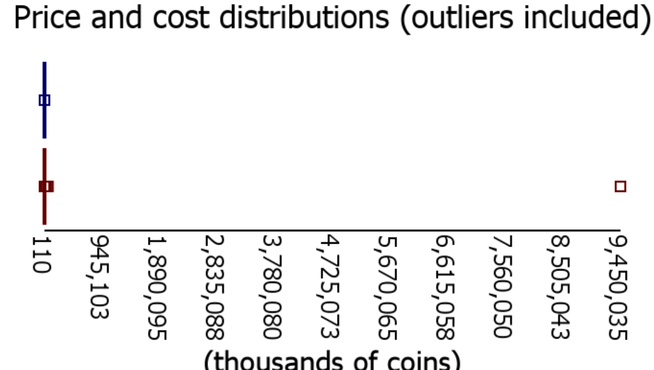


The distribution is centered around 133,100 coins (median). It has a low variability (IQR of 0 coins) and is mostly symmetrical. There are no large gaps in the distribution. There are 3 outliers on the low end, the lowest being 110,000 coins and 10 outliers on the high end, the highest being 570,000 coins.



The distribution is centered around 423,259 coins (median). It has a low variability (IQR of 27,205 coins) and is mostly symmetrical. There are no large gaps in the distribution. There are 4 outliers on the low end, the lowest being 295,764 coins and 445 outliers on the high end, the highest being 9,450,035,068 coins.





Key:

Sell Price

Material Cost

5 number summeries (thousands of coins):

min: 133, q1: 133, median: 133, q3: 133, max: 133

min: 364, q1: 409, median: 423, q3: 436, max: 489

Statistical test comparing the selling prices and material costs of an <u>unstable dragon leggings</u>

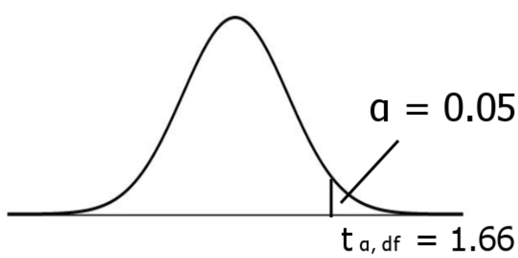
Let group1 = Sell prices of an unstable dragon leggings, group2 = Material cost of an unstable dragon leggings
X_1 = Sell price of an unstable dragon leggings (coins), X_2 = Material cost of an unstable dragon leggings (coins)
μ_1 = Mean sell price of an unstable dragon leggings (coins),
μ_2 = Mean material cost of an unstable dragon leggings (coins)

H_o: $\mu_1 = \mu_2$ H_a: $\mu_1 > \mu_2$

<u>Requirements for a difference of means test (σ_1 and σ_2 unknown):</u>

1. 2 independent SRS's: ✓ $n_1 = 113$ $n_2 = 7039$
   One price/cost from either group will not affect any price/cost from either group
2. σ is not known, but S_x is: ✓ $S_1 = 0$ coins $S_2 = 20{,}585.1171$ coins
3. $n_1 > 30$ and $n_2 > 30$: ✓ $n_1 = 113 > 30$ $n_2 = 7039 > 30$

<u>Rejection Critieria:</u>
$\alpha = 0.05$ df = 112



Reject H_o if $t > 1.66$

<u>Test Statistic:</u>

$$t = \frac{(\bar{x}_1 - \bar{x}_2) - (\mu_1 - \mu_2)}{\sqrt{\frac{S_1^2}{N_1} + \frac{S_2^2}{N_2}}}$$

$t = -1{,}184.96$
p-value > 0.9999

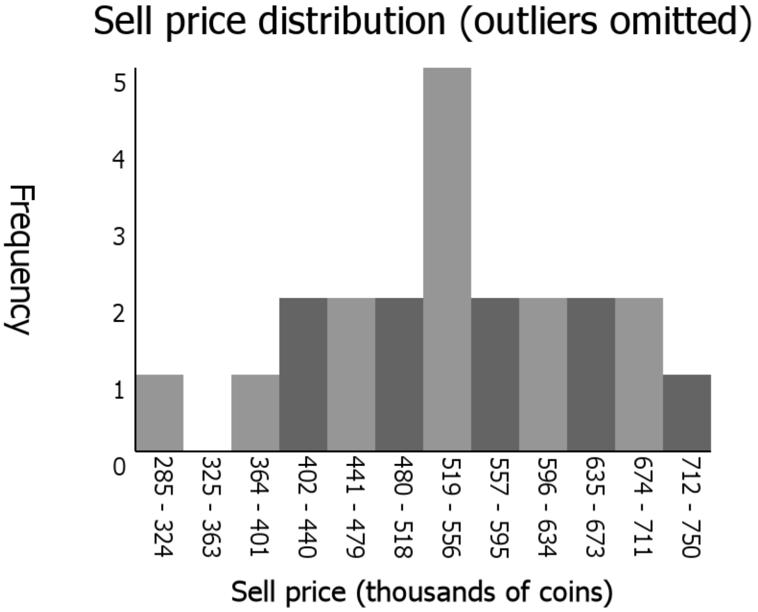
Inputs:
$\bar{x}_1 = 133{,}100$ (coins)
$\bar{x}_2 = 423{,}837.3482$ (coins)
$S_1 = 0$ (coins)
$S_2 = 20{,}585.1171$ (coins)
$n_1 = 113$
$n_2 = 7{,}039$

Fail to reject H_o since $-1{,}184.96 < 1.66$

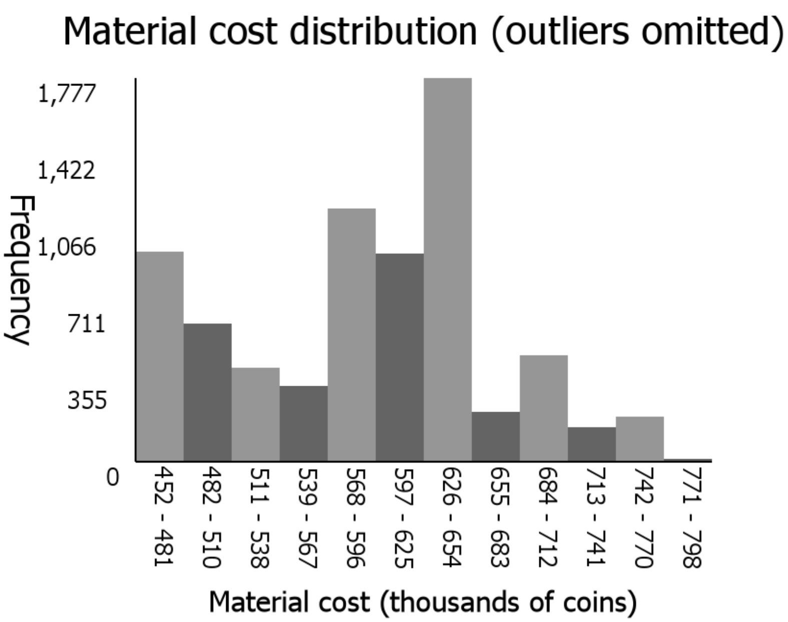
There is not significant evidence at the α=0.05 level of significance to support the claim that the mean selling price of an unstable dragon leggings is greater than the mean cost of the materials required to make it.

Since we failed to reject H_o, it suggests that on average people did not earn more coins from selling this item than it would have cost them to buy the materials.

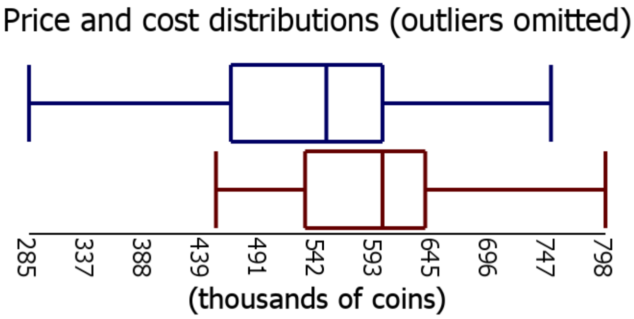
Selling prices and material costs of a strong dragon boots

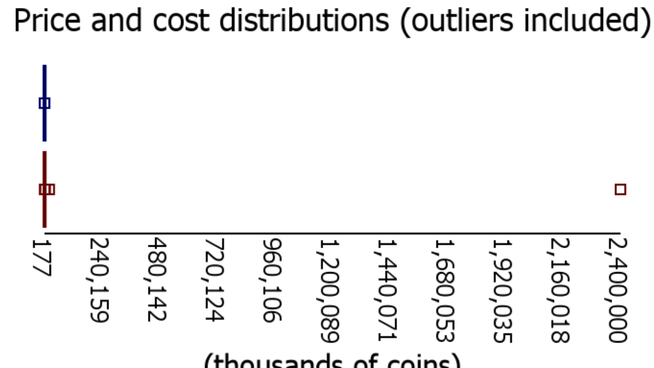


The distribution is centered around 550,000 coins (median). It has a low variability (IQR of 135,000 coins) and is mostly symmetrical. There is a large gap between 324,037 - 362,761 coins. There are 2 outliers on the low end, the lowest being 177,156 coins and 1 outliers on the high end, the highest being 820,100 coins.



The distribution is centered around 600,000 coins (median). It has a low variability (IQR of 106,961 coins) and is mostly symmetrical. There are no large gaps in the distribution. There are 0 outliers on the low end and 70 outliers on the high end, the highest being 2,399,999,995 coins.





Key:
Sell Price
Material Cost

5 number summeries (thousands of coins):

min: 285, q1: 465, median: 550, q3: 600, max: 750

min: 452, q1: 531, median: 600, q3: 638, max: 798

Statistical test comparing the selling prices and material costs of a strong dragon boots

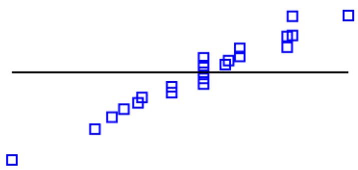
Let group1 = Sell prices of a strong dragon boots, group2 = Material cost of a strong dragon boots
X_1 = Sell price of a strong dragon boots (coins), X_2 = Material cost of a strong dragon boots (coins)
μ_1 = Mean sell price of a strong dragon boots (coins), μ_2 = Mean material cost of a strong dragon boots (coins)

H_o: $\mu_1 = \mu_2$ H_a: $\mu_1 > \mu_2$

Requirements for a difference of means test (σ_1 and σ_2 unknown):

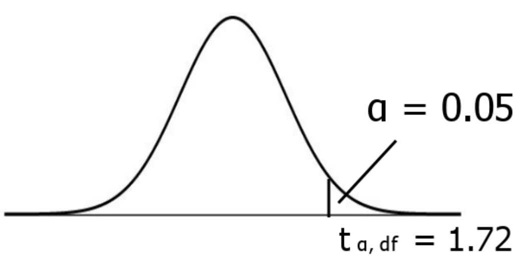
1. 2 independent SRS's: ✓ $n_1 = 22$ $n_2 = 7418$
   One price/cost from either group will not affect any price/cost from either group
2. σ is not known, but S_x is: ✓ S_1 = 107,707.1138 coins S_2 = 75,959.5806 coins
3. Group1 is normally distributed and $n_2 > 30$: ✓

Quantile plot of sell prices



$n_2 = 7418 > 30$

Rejection Critieria:
$\alpha = 0.05$ df = 21



Reject H_o if $t > 1.72$

Test Statistic:

$$t = \frac{(\bar{x}_1 - \bar{x}_2) - (\mu_1 - \mu_2)}{\sqrt{\frac{S_1^2}{N_1} + \frac{S_2^2}{N_2}}}$$

$t = -1.98$
p-value = 0.9696

Inputs:
$\bar{x}_1$ = 546,655.9091 (coins)
$\bar{x}_2$ = 592,187.9032 (coins)
S_1 = 107,707.1138 (coins)
S_2 = 75,959.5806 (coins)
n_1 = 22
n_2 = 7,418

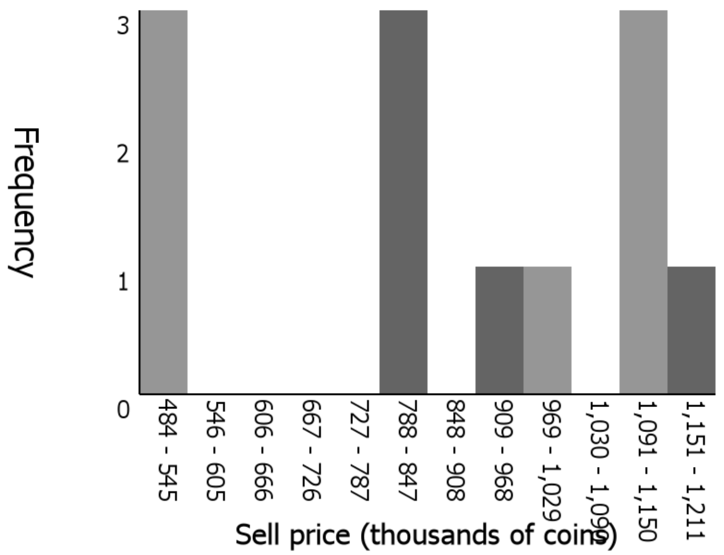
Fail to reject H_o since $-1.98 < 1.72$

There is not significant evidence at the α=0.05 level of significance to support the claim that the mean selling price of a strong dragon boots is greater than the mean cost of the materials required to make it.

Since we failed to reject H_o, it suggests that on average people did not earn more coins from selling this item than it would have cost them to buy the materials.

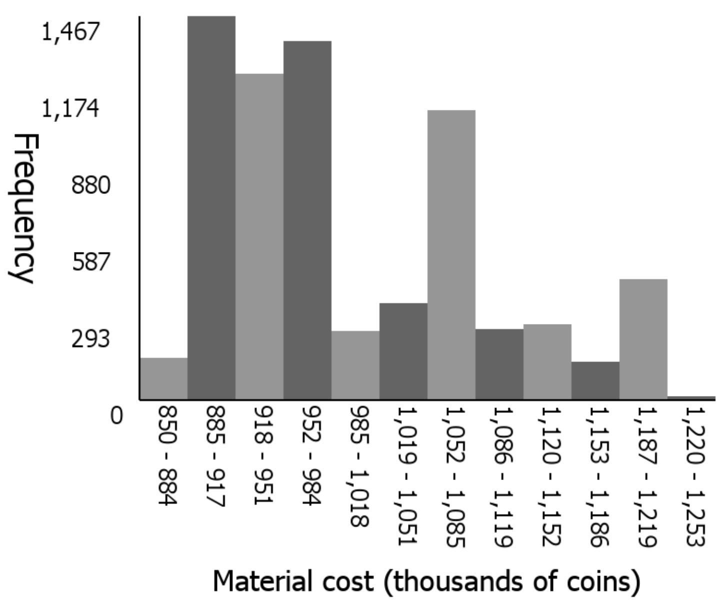
Selling prices and material costs of a base griffin upgrade stone

Sell price distribution (outliers omitted)



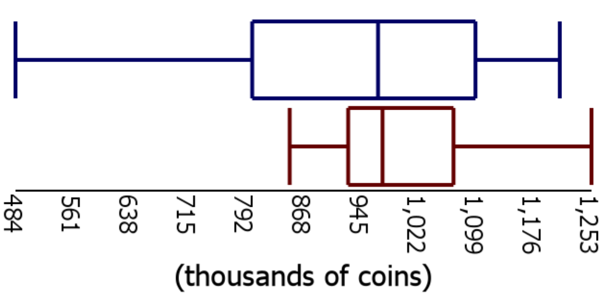
The distribution is centered around 968,000 coins (median). It has a low variability (IQR of 298,075 coins) and is skewed left. There are large gaps between 544,552 - 786,762 coins, 847,314 - 907,866 coins, and 1,028,971 - 1,089,523 coins. There are 0 outliers on the low end and 1 outliers on the high end, the highest being 13,000,000 coins.

Material cost distribution (outliers omitted)

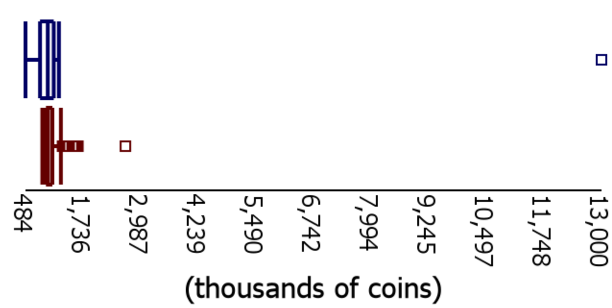


The distribution is centered around 973,988 coins (median). It has a low variability (IQR of 140,629 coins) and is mostly symmetrical. There are no large gaps in the distribution. There are 0 outliers on the low end and 316 outliers on the high end, the highest being 2,655,383 coins.

Price and cost distributions (outliers omitted)



Price and cost distributions (outliers included)



Key:

Sell Price

Material Cost

5 number summeries (thousands of coins):

min: 484, q1: 800, median: 968, q3: 1,098, max: 1,211

min: 850, q1: 928, median: 974, q3: 1,069, max: 1,253

Statistical test comparing the selling prices and material costs of a base griffin upgrade stone

Let group1 = Sell prices of a base griffin upgrade stone, group2 = Material cost of a base griffin upgrade stone

X_1 = Sell price of a base griffin upgrade stone (coins), X_2 = Material cost of a base griffin upgrade stone (coins)

μ_1 = Mean sell price of a base griffin upgrade stone (coins),

μ_2 = Mean material cost of a base griffin upgrade stone (coins)

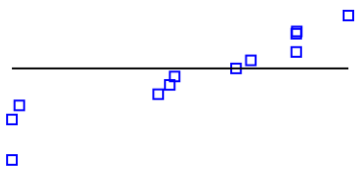
$H_o: \mu_1 = \mu_2 \quad H_a: \mu_1 > \mu_2$

Requirements for a difference of means test (σ_1 and σ_2 unknown):

1. 2 independent SRS's: ✓ $n_1 = 12$ $n_2 = 7172$

   One price/cost from either group will not affect any price/cost from either group
2. σ is not known, but S_x is: ✓ S_1 = 259,718.2319 coins S_2 = 91,474.0344 coins
3. Group1 is normally distributed and $n_2 > 30$: ✓

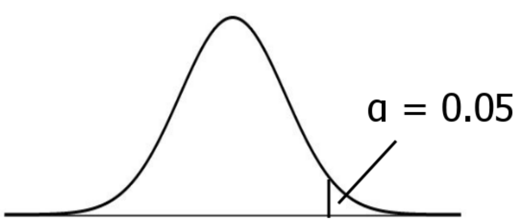
Quantile plot of sell prices



$n_2 = 7172 > 30$

Rejection Critieria:

$\alpha = 0.05 \quad df = 11$



$t_{\alpha, df} = 1.80$

Reject H_o if $t > 1.80$

Test Statistic:

$$t = \frac{(\bar{x}_1 - \bar{x}_2) - (\mu_1 - \mu_2)}{\sqrt{\frac{S_1^2}{N_1} + \frac{S_2^2}{N_2}}}$$

$t = -1.77$

p-value = 0.9478

Fail to reject H_o since $-1.77 < 1.80$

Inputs:

$\bar{x}_1$ = 866,859.1667 (coins)

$\bar{x}_2$ = 999,585.0396 (coins)

S_1 = 259,718.2319 (coins)

S_2 = 91,474.0344 (coins)

$n_1 = 12$

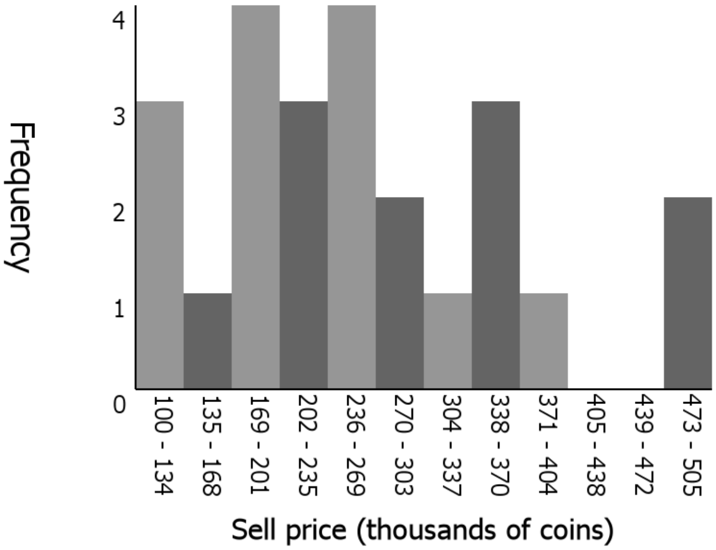
n_2 = 7,172

There is not significant evidence at the α=0.05 level of significance to support the claim that the mean selling price of a base griffin upgrade stone is greater than the mean cost of the materials required to make it.

Since we failed to reject H_o, it suggests that on average people did not earn more coins from selling this item than it would have cost them to buy the materials.

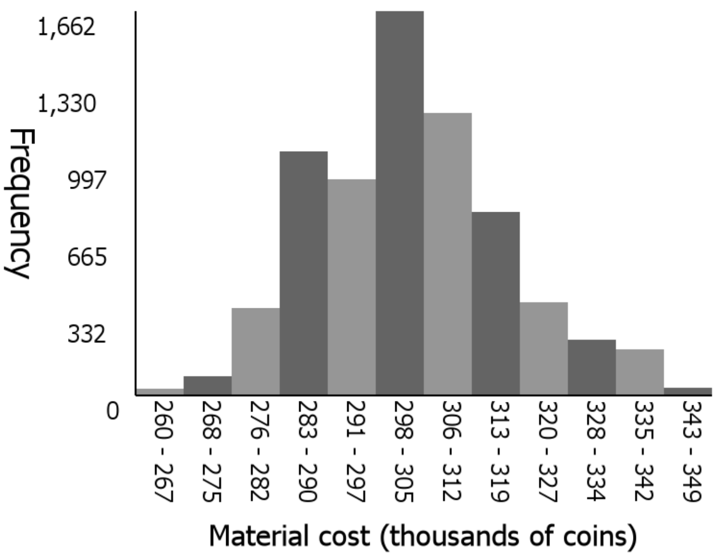
Selling prices and material costs of an unstable dragon helmet

Sell price distribution (outliers omitted)



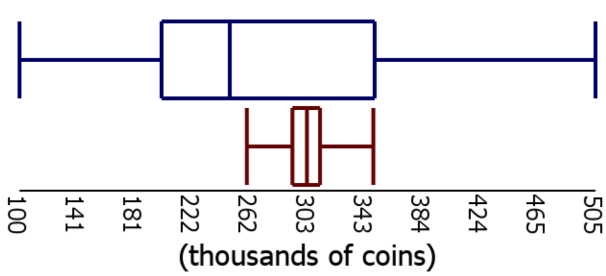
The distribution is centered around 248,018 coins (median). It has a low variability (IQR of 150,000 coins) and is skewed right. There is a large gap between 404,087 - 471,662 coins. There are 0 outliers on the low end and 0 outliers on the high end.

Material cost distribution (outliers omitted)

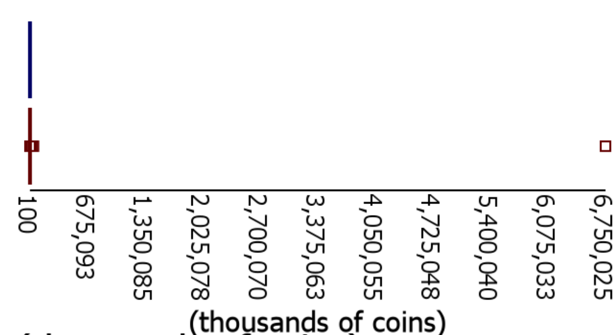


The distribution is centered around 302,328 coins (median). It has a low variability (IQR of 19,432 coins) and is mostly symmetrical. There are no large gaps in the distribution. There are 4 outliers on the low end, the lowest being 211,260 coins and 445 outliers on the high end, the highest being 6,750,025,048 coins.

Price and cost distributions (outliers omitted)



Price and cost distributions (outliers included)



Key:

Sell Price

Material Cost

5 number summeries (thousands of coins):

min: 100, q1: 200, median: 248, q3: 350, max: 505

min: 260, q1: 292, median: 302, q3: 312, max: 349

Statistical test comparing the selling prices and material costs of an <u>unstable dragon helmet</u>

Let group1 = Sell prices of an unstable dragon helmet, group2 = Material cost of an unstable dragon helmet

X_1 = Sell price of an unstable dragon helmet (coins), X_2 = Material cost of an unstable dragon helmet (coins)

μ_1 = Mean sell price of an unstable dragon helmet (coins),

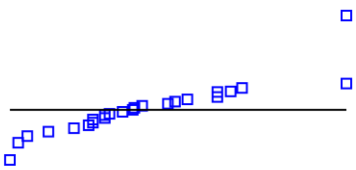
μ_2 = Mean material cost of an unstable dragon helmet (coins)

H_o: $\mu_1 = \mu_2$ H_a: $\mu_1 > \mu_2$

Requirements for a difference of means test (σ_1 and σ_2 unknown):

1. 2 independent SRS's: ✓ $n_1 = 24$ $n_2 = 7039$
   One price/cost from either group will not affect any price/cost from either group
2. σ is not known, but S_x is: ✓ S_1 = 108,914.7239 coins S_2 = 14,703.6538 coins
3. Group1 is normally distributed and $n_2 > 30$: ✓

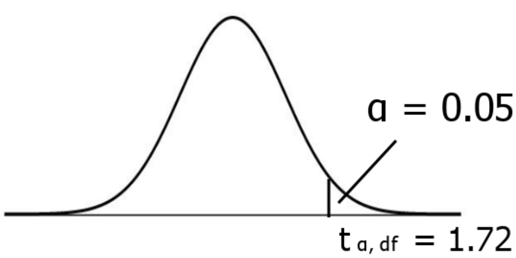
Quantile plot of sell prices



$n_2 = 7039 > 30$

Rejection Critieria:

$\alpha = 0.05$ df = 23



Reject H_o if $t > 1.72$

Test Statistic:

$$t = \frac{(\bar{x}_1 - \bar{x}_2) - (\mu_1 - \mu_2)}{\sqrt{\frac{S_1^2}{N_1} + \frac{S_2^2}{N_2}}}$$

$t = -1.90$

p-value = 0.9651

Inputs:

$\bar{x}_1$ = 260,469.25 (coins)

$\bar{x}_2$ = 302,740.9778 (coins)

S_1 = 108,914.7239 (coins)

S_2 = 14,703.6538 (coins)

$n_1 = 24$

n_2 = 7,039

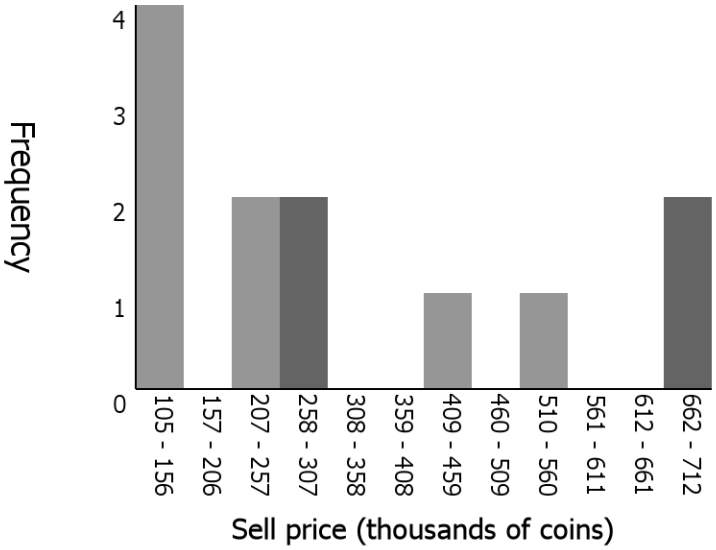
Fail to reject H_o since $-1.90 < 1.72$

There is not significant evidence at the α=0.05 level of significance to support the claim that the mean selling price of an unstable dragon helmet is greater than the mean cost of the materials required to make it.

Since we failed to reject H_o, it suggests that on average people did not earn more coins from selling this item than it would have cost them to buy the materials.

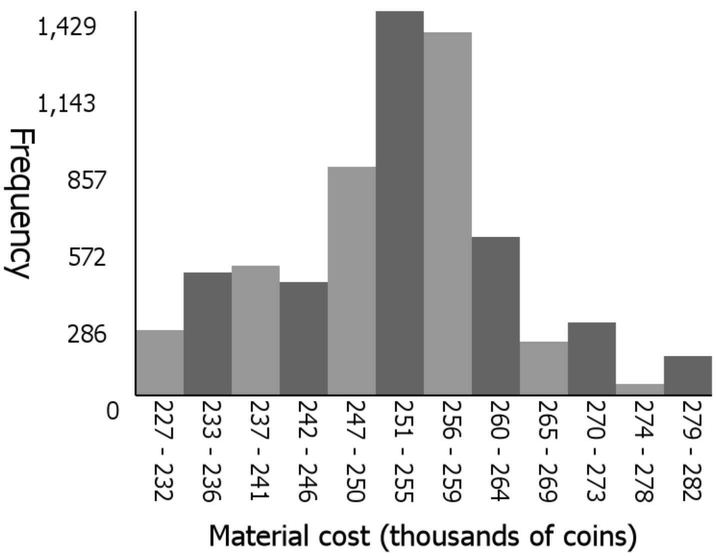
Selling prices and material costs of an old dragon boots

Sell price distribution (outliers omitted)



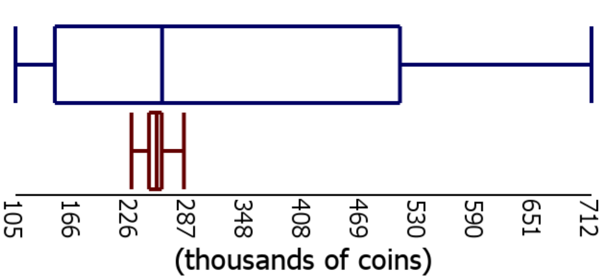
The distribution is centered around 259,375 coins (median). It has a low variability (IQR of 363,590 coins) and is skewed right. There are large gaps between 155,510 - 206,079 coins, 307,217 - 408,355 coins, 458,924 - 509,493 coins, and 560,062 - 661,200 coins. There are 0 outliers on the low end and 0 outliers on the high end.

Material cost distribution (outliers omitted)

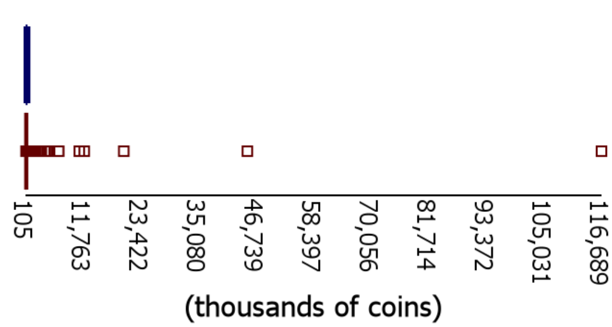


The distribution is centered around 253,704 coins (median). It has a low variability (IQR of 13,392 coins) and is mostly symmetrical. There are no large gaps in the distribution. There are 48 outliers on the low end, the lowest being 215,960 coins and 951 outliers on the high end, the highest being 116,689,217 coins.

Price and cost distributions (outliers omitted)



Price and cost distributions (outliers included)



Key:

Sell Price

Material Cost

5 number summeries (thousands of coins):

min: 105, q1: 146, median: 259, q3: 510, max: 712

min: 227, q1: 246, median: 254, q3: 259, max: 282

Statistical test comparing the selling prices and material costs of an old dragon boots

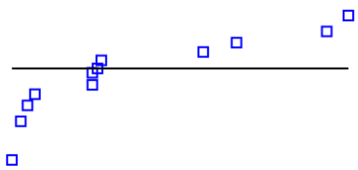
Let group1 = Sell prices of an old dragon boots, group2 = Material cost of an old dragon boots
X_1 = Sell price of an old dragon boots (coins), X_2 = Material cost of an old dragon boots (coins)
μ_1 = Mean sell price of an old dragon boots (coins), μ_2 = Mean material cost of an old dragon boots (coins)

H_o: $\mu_1 = \mu_2$ H_a: $\mu_1 > \mu_2$

Requirements for a difference of means test (σ_1 and σ_2 unknown):

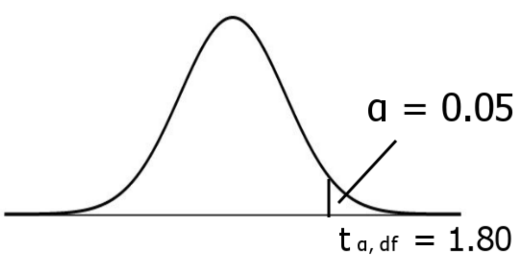
1. 2 independent SRS's: ✓ $n_1 = 12$ $n_2 = 6489$
   One price/cost from either group will not affect any price/cost from either group
2. σ is not known, but S_x is: ✓ S_1 = 212,794.8064 coins S_2 = 10,739.2992 coins
3. Group1 is normally distributed and $n_2 > 30$: ✓

Quantile plot of sell prices $n_2 = 6489 > 30$



Rejection Critieria:

$\alpha = 0.05$ df = 11



Reject H_o if $t > 1.80$

Test Statistic:

$$t = \frac{(\bar{x}_1 - \bar{x}_2) - (\mu_1 - \mu_2)}{\sqrt{\frac{S_1^2}{N_1} + \frac{S_2^2}{N_2}}}$$

$t = 1.15$
p-value = 0.1365

Inputs:

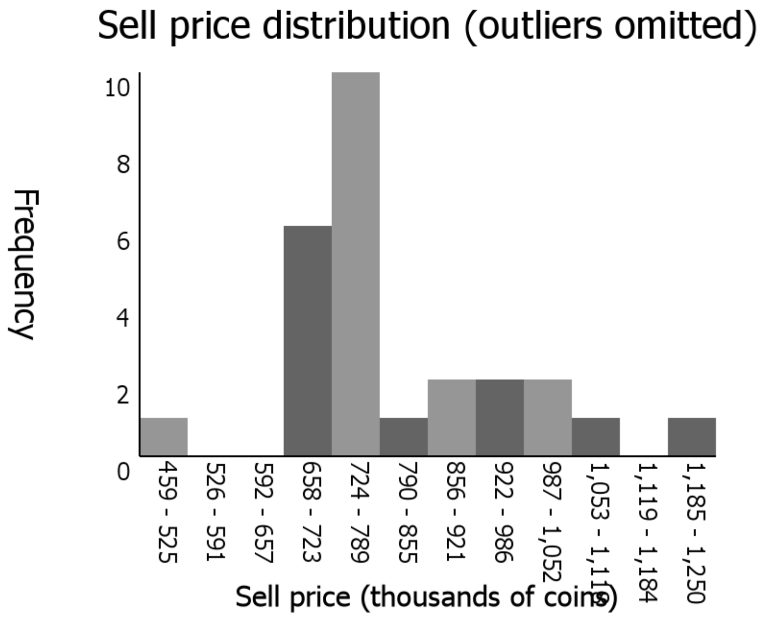
$\bar{x}_1$ = 322,962.25 (coins)
$\bar{x}_2$ = 252,091.63 (coins)
S_1 = 212,794.8064 (coins)
S_2 = 10,739.2992 (coins)
$n_1 = 12$
n_2 = 6,489

Fail to reject H_o since $1.15 < 1.80$

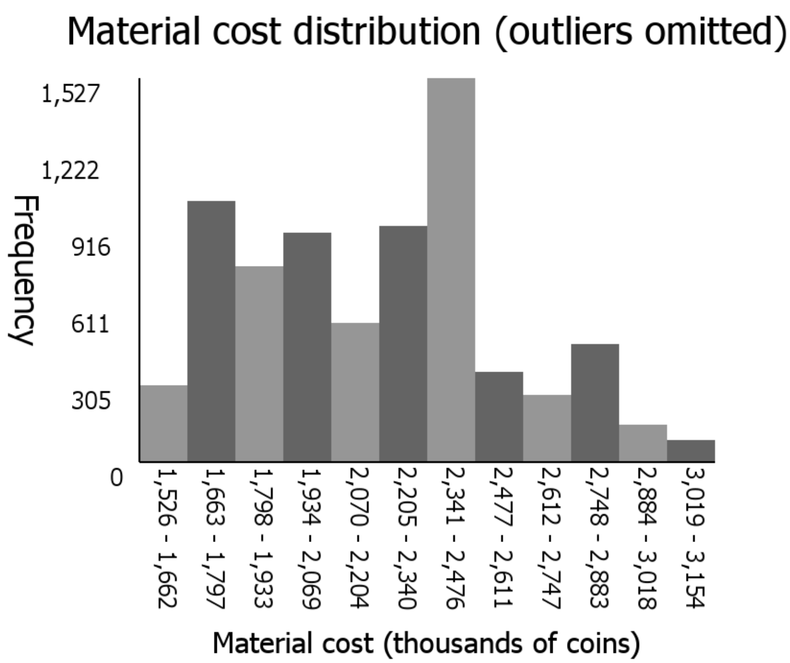
There is not significant evidence at the α=0.05 level of significance to support the claim that the mean selling price of an old dragon boots is greater than the mean cost of the materials required to make it.

Since we failed to reject H_o, it suggests that on average people did not earn more coins from selling this item than it would have cost them to buy the materials.

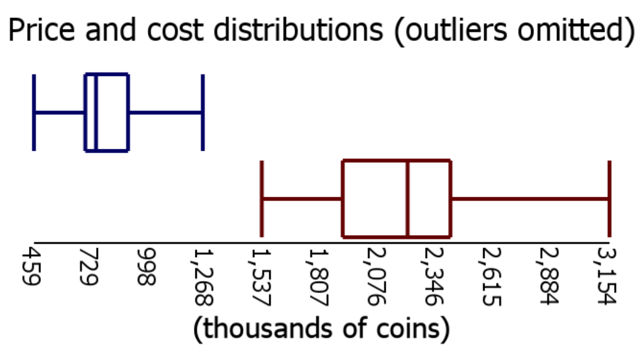
Selling prices and material costs of a wise dragon chestplate

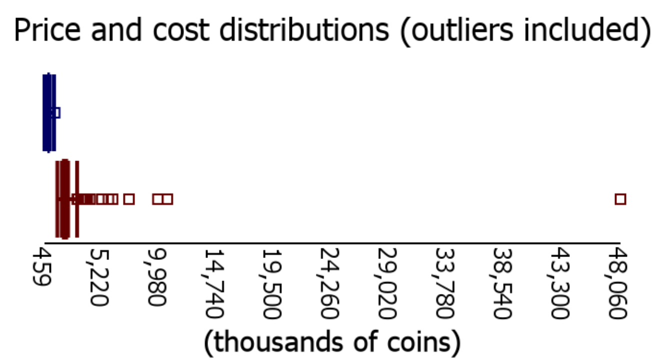


The distribution is centered around 750,000 coins (median). It has a low variability (IQR of 200,000 coins) and is skewed right. There are large gaps between 525,374 - 657,124 coins and 1,118,250 - 1,184,125 coins. There are 0 outliers on the low end and 1 outliers on the high end, the highest being 1,300,000 coins.



The distribution is centered around 2,208,619 coins (median). It has a low variability (IQR of 504,432 coins) and is mostly symmetrical. There are no large gaps in the distribution. There are 0 outliers on the low end and 100 outliers on the high end, the highest being 48,060,112 coins.





Key:
Sell Price
Material Cost

5 number summeries (thousands of coins):

min: 459, q1: 700, median: 750, q3: 900, max: 1,250

min: 1,526, q1: 1,905, median: 2,209, q3: 2,409, max: 3,154

Statistical test comparing the selling prices and material costs of a <u>wise dragon chestplate</u>

Let group1 = Sell prices of a wise dragon chestplate, group2 = Material cost of a wise dragon chestplate

X_1 = Sell price of a wise dragon chestplate (coins), X_2 = Material cost of a wise dragon chestplate (coins)

μ_1 = Mean sell price of a wise dragon chestplate (coins),

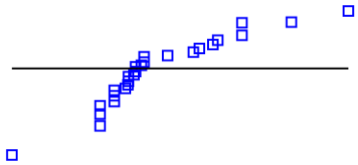
μ_2 = Mean material cost of a wise dragon chestplate (coins)

$H_o: \mu_1 = \mu_2 \quad H_a: \mu_1 > \mu_2$

<u>Requirements for a difference of means test (σ_1 and σ_2 unknown):</u>

1. 2 independent SRS's: ✓ $n_1 = 26$ $n_2 = 7388$
   One price/cost from either group will not affect any price/cost from either group
2. σ is not known, but S_x is: ✓ $S_1 = 163{,}370.548$ coins $S_2 = 352{,}261.917$ coins
3. Group1 is normally distributed and $n_2 > 30$: ✓

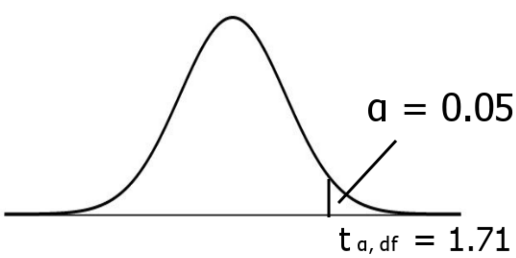
Quantile plot of sell prices



$n_2 = 7388 > 30$

<u>Rejection Critieria:</u>

$\alpha = 0.05 \quad df = 25$



Reject H_o if $t > 1.71$

<u>Test Statistic:</u>

$$t = \frac{(\bar{x}_1 - \bar{x}_2) - (\mu_1 - \mu_2)}{\sqrt{\frac{S_1^2}{N_1} + \frac{S_2^2}{N_2}}}$$

$t = -43.03$

p-value > 0.9999

Inputs:

$\bar{x}_1 = 803{,}307.8077$ (coins)

$\bar{x}_2 = 2{,}193{,}095.4238$ (coins)

$S_1 = 163{,}370.548$ (coins)

$S_2 = 352{,}261.917$ (coins)

$n_1 = 26$

$n_2 = 7{,}388$

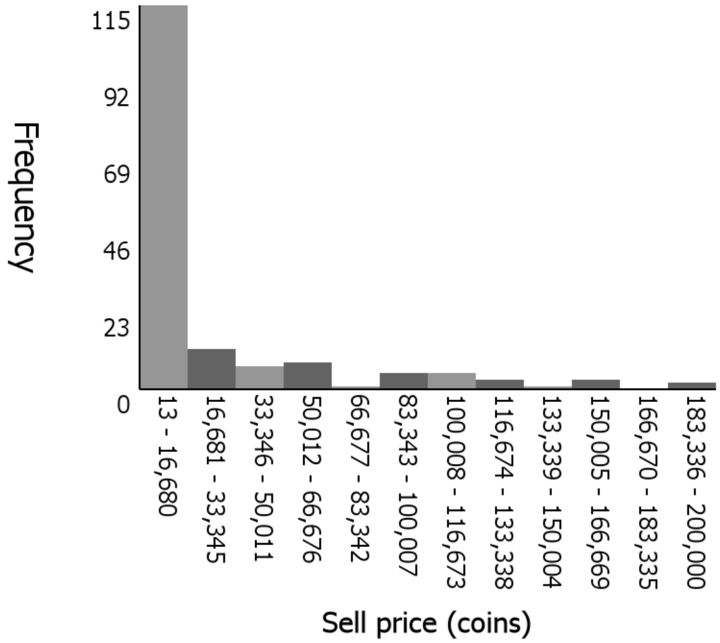
Fail to reject H_o since $-43.03 < 1.71$

There is not significant evidence at the α=0.05 level of significance to support the claim that the mean selling price of a wise dragon chestplate is greater than the mean cost of the materials required to make it.

Since we failed to reject H_o, it suggests that on average people did not earn more coins from selling this item than it would have cost them to buy the materials.

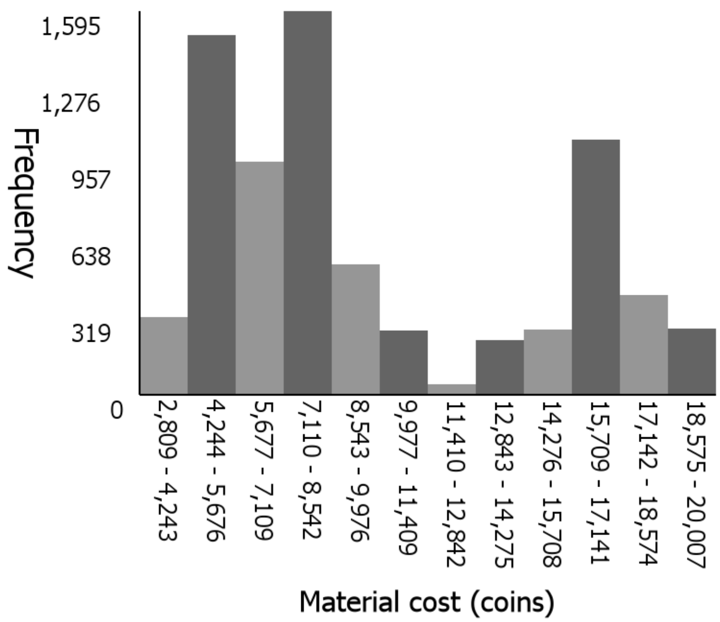
Selling prices and material costs of a soulflow pile

Sell price distribution (outliers omitted)



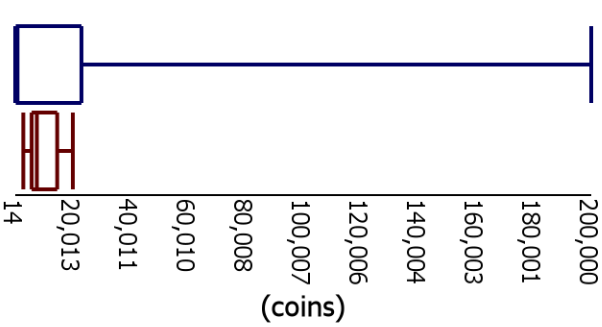
The distribution is centered around 800 coins (median). It has a high variability (IQR of 22,816 coins) and is skewed right. There is a large gap between 166,669 - 183,335 coins. There are 0 outliers on the low end and 28 outliers on the high end, the highest being 4,365,752 coins.

Material cost distribution (outliers omitted)

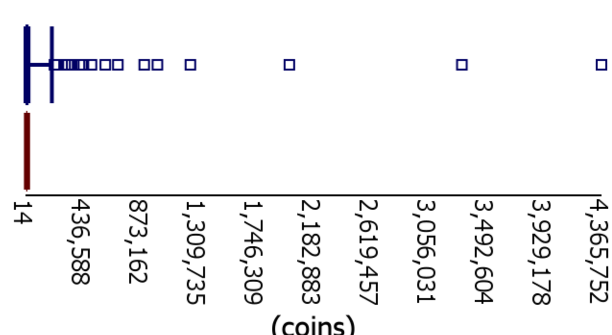


The distribution is centered around 7,516 coins (median). It has a low variability (IQR of 8,866 coins) and is skewed right. There are no large gaps in the distribution. There are 0 outliers on the low end and 0 outliers on the high end.

Price and cost distributions (outliers omitted)



Price and cost distributions (outliers included)



Key:

Sell Price

Material Cost

5 number summeries (coins):

min: 14, q1: 184, median: 800, q3: 23,000, max: 200,000

min: 2,810, q1: 5,712, median: 7,516, q3: 14,578, max: 20,007

Statistical test comparing the selling prices and material costs of a soulflow pile

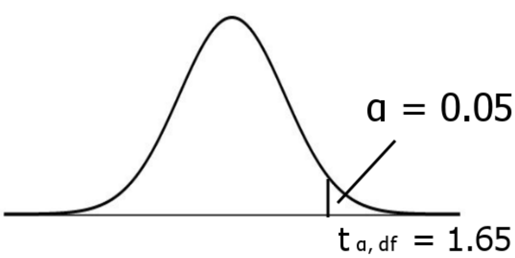
Let group1 = Sell prices of a soulflow pile, group2 = Material cost of a soulflow pile
X_1 = Sell price of a soulflow pile (coins), X_2 = Material cost of a soulflow pile (coins)
μ_1 = Mean sell price of a soulflow pile (coins), μ_2 = Mean material cost of a soulflow pile (coins)

H_o: $\mu_1 = \mu_2$ H_a: $\mu_1 > \mu_2$

Requirements for a difference of means test (σ_1 and σ_2 unknown):

1. 2 independent SRS's: ✓ $n_1 = 162$ $n_2 = 7488$
   One price/cost from either group will not affect any price/cost from either group
2. σ is not known, but S_x is: ✓ $S_1 = 43{,}879.5294$ coins $S_2 = 4{,}881.3396$ coins
3. $n_1 > 30$ and $n_2 > 30$: ✓ $n_1 = 162 > 30$ $n_2 = 7488 > 30$

Rejection Critieria:
$\alpha = 0.05$ df = 161



Reject H_o if $t > 1.65$

Test Statistic:

$$t = \frac{(\bar{x}_1 - \bar{x}_2) - (\mu_1 - \mu_2)}{\sqrt{\frac{S_1^2}{N_1} + \frac{S_2^2}{N_2}}}$$

Inputs:
$\bar{x}_1 = 23{,}302.6296$ (coins)
$\bar{x}_2 = 9{,}760.3868$ (coins)
$S_1 = 43{,}879.5294$ (coins)
$S_2 = 4{,}881.3396$ (coins)
$n_1 = 162$
$n_2 = 7{,}488$

$t = 3.93$
p-value = 0.0001

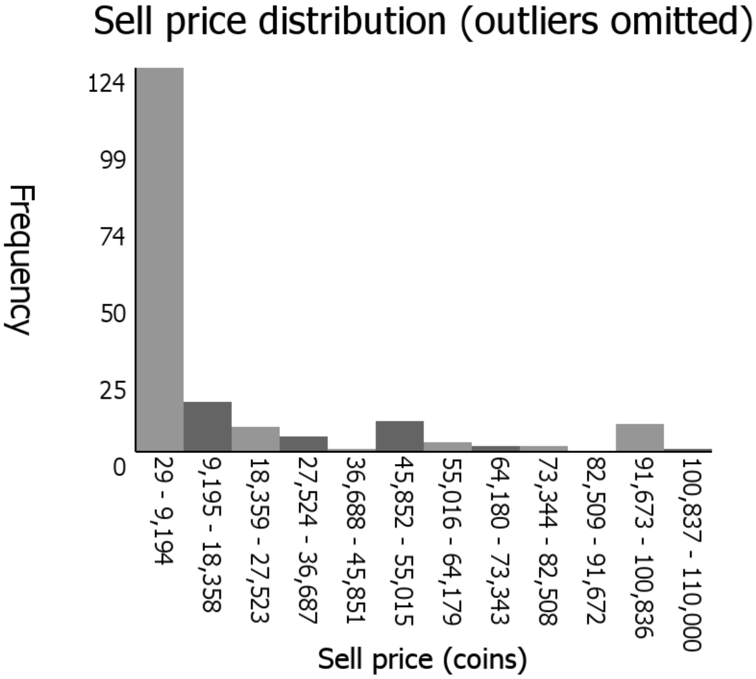
Reject H_o since $3.93 > 1.65$

There is significant evidence at the $\alpha=0.05$ level of significance to support the claim that the mean selling price of a soulflow pile is greater than the mean cost of the materials required to make it.

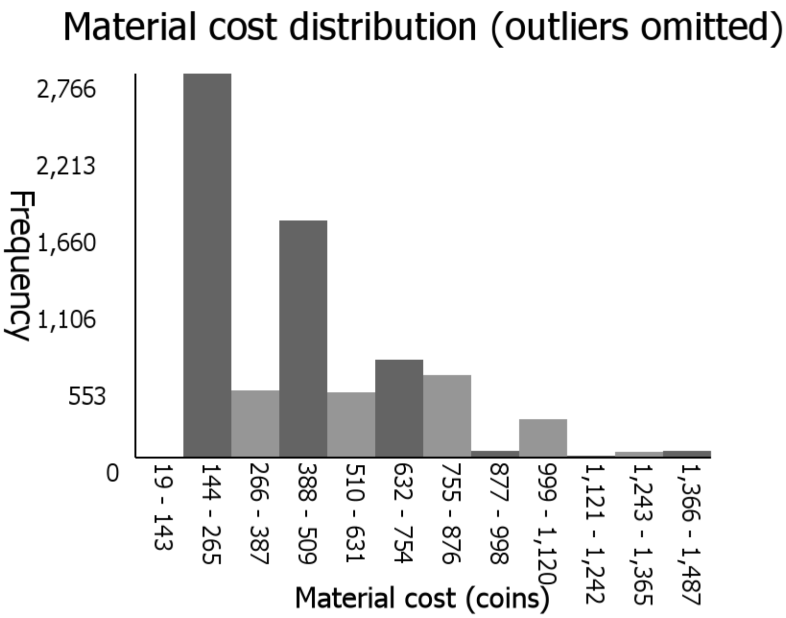
Since we rejected H_o, it suggests that on average people earned more coins from selling this item than it would have cost them to buy the materials.

Implication: the test suggests that on average we could make a profit from flipping this item.

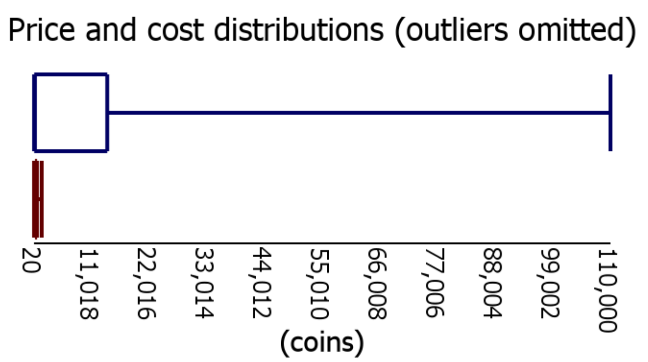
Selling prices and material costs of a magical lava bucket

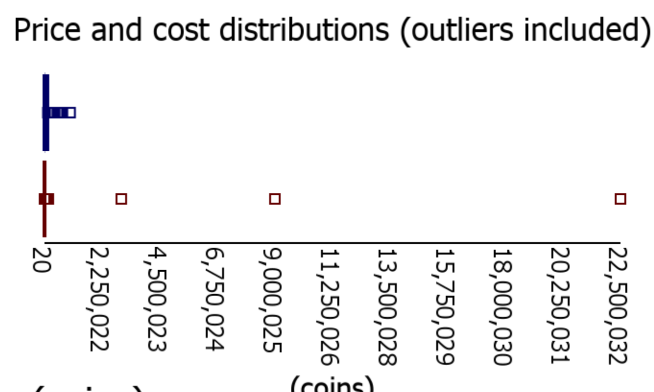


The distribution is centered around 199 coins (median). It has a high variability (IQR of 13,931 coins) and is skewed right. There is a large gap between 82,508 - 91,672 coins. There are 0 outliers on the low end and 29 outliers on the high end, the highest being 1,000,000 coins.



The distribution is centered around 411 coins (median). It has a low variability (IQR of 376 coins) and is skewed right. There are no large gaps in the distribution. There are 0 outliers on the low end and 334 outliers on the high end, the highest being 22,500,032 coins.





Key:

Sell Price

Material Cost

5 number summeries (coins):

min: 30, q1: 61, median: 199, q3: 13,992, max: 110,000

min: 20, q1: 216, median: 411, q3: 592, max: 1,487

Statistical test comparing the selling prices and material costs of a magical lava bucket

Let group1 = Sell prices of a magical lava bucket, group2 = Material cost of a magical lava bucket
X_1 = Sell price of a magical lava bucket (coins), X_2 = Material cost of a magical lava bucket (coins)
μ_1 = Mean sell price of a magical lava bucket (coins), μ_2 = Mean material cost of a magical lava bucket (coins)

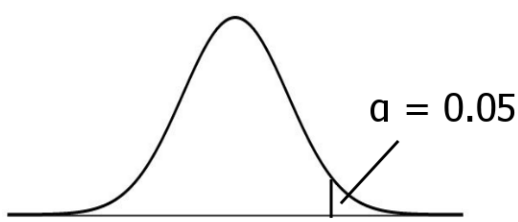
$H_o: \mu_1 = \mu_2$ $\quad H_a: \mu_1 > \mu_2$

Requirements for a difference of means test (σ_1 and σ_2 unknown):

1. 2 independent SRS's: ✓ $n_1 = 181$ $n_2 = 7154$
   One price/cost from either group will not affect any price/cost from either group
2. σ is not known, but S_x is: ✓ $S_1 = 27{,}300.2952$ coins $S_2 = 262.0895$ coins
3. $n_1 > 30$ and $n_2 > 30$: ✓ $n_1 = 181 > 30$ $n_2 = 7154 > 30$

Rejection Critieria:

$\alpha = 0.05$ df = 180



Reject H_o if $t > 1.65$

Test Statistic:

$$t = \frac{(\bar{x}_1 - \bar{x}_2) - (\mu_1 - \mu_2)}{\sqrt{\frac{S_1^2}{N_1} + \frac{S_2^2}{N_2}}}$$

$t = 6.89$
p-value < 0.0001

Inputs:

$\bar{x}_1 = 14{,}430.6077$ (coins)
$\bar{x}_2 = 447.7867$ (coins)
$S_1 = 27{,}300.2952$ (coins)
$S_2 = 262.0895$ (coins)
$n_1 = 181$
$n_2 = 7{,}154$

Reject H_o since $6.89 > 1.65$

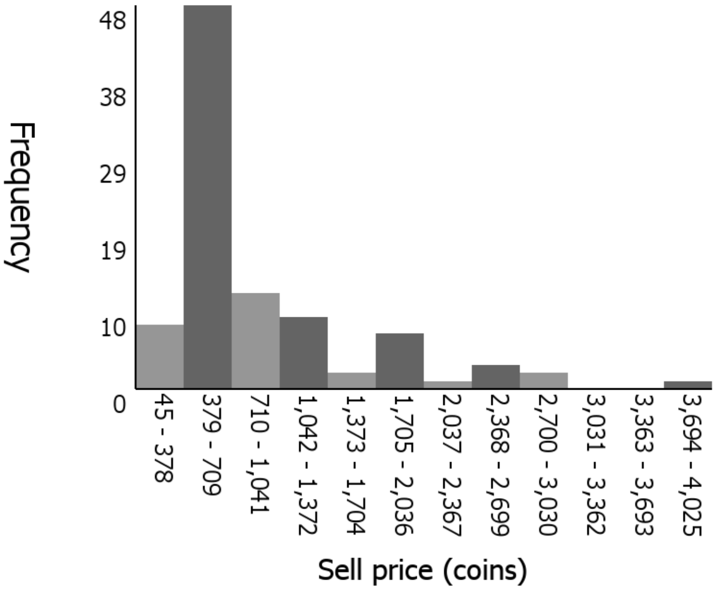
There is significant evidence at the $\alpha=0.05$ level of significance to support the claim that the mean selling price of a magical lava bucket is greater than the mean cost of the materials required to make it.

Since we rejected H_o, it suggests that on average people earned more coins from selling this item than it would have cost them to buy the materials.

Implication: the test suggests that on average we could make a profit from flipping this item.

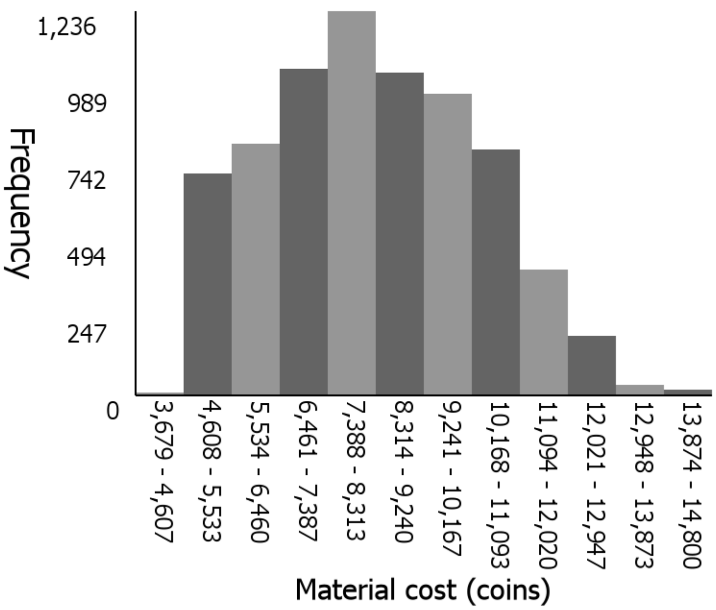
Selling prices and material costs of a small backpack

Sell price distribution (outliers omitted)



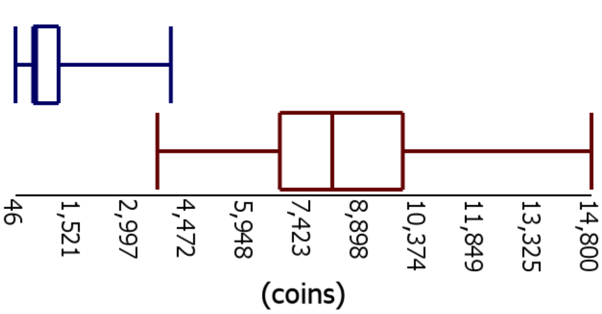
The distribution is centered around 575 coins (median). It has a low variability (IQR of 650 coins) and is skewed right. There is a large gap between 3,030 - 3,693 coins. There are 0 outliers on the low end and 21 outliers on the high end, the highest being 52,600,000 coins.

Material cost distribution (outliers omitted)

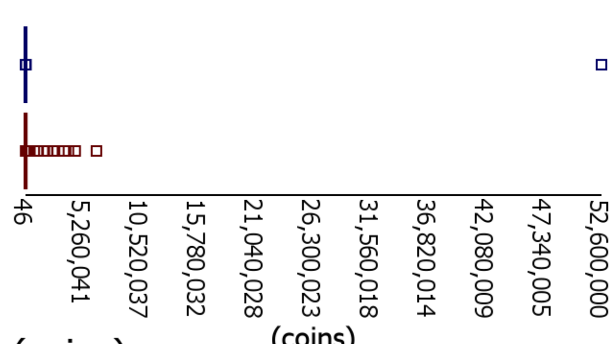


The distribution is centered around 8,160 coins (median). It has a low variability (IQR of 3,149 coins) and is mostly symmetrical. There are no large gaps in the distribution. There are 0 outliers on the low end and 222 outliers on the high end, the highest being 6,480,592 coins.

Price and cost distributions (outliers omitted)



Price and cost distributions (outliers included)



Key:

Sell Price

Material Cost

5 number summeries (coins):

min: 46, q1: 500, median: 575, q3: 1,150, max: 4,025

min: 3,680, q1: 6,817, median: 8,160, q3: 9,966, max: 14,800

Statistical test comparing the selling prices and material costs of a small backpack

Let group1 = Sell prices of a small backpack, group2 = Material cost of a small backpack
X_1 = Sell price of a small backpack (coins), X_2 = Material cost of a small backpack (coins)
μ_1 = Mean sell price of a small backpack (coins), μ_2 = Mean material cost of a small backpack (coins)

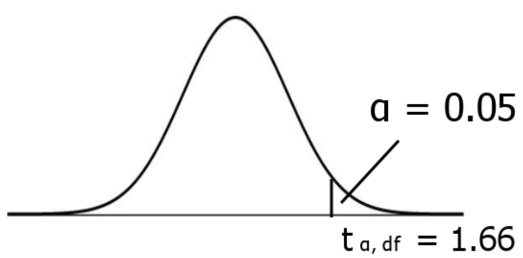
H_o: $\mu_1 = \mu_2$ H_a: $\mu_1 > \mu_2$

Requirements for a difference of means test (σ_1 and σ_2 unknown):

1. 2 independent SRS's: ✓ $n_1 = 93$ $n_2 = 7266$
   One price/cost from either group will not affect any price/cost from either group
2. σ is not known, but S_x is: ✓ $S_1 = 732.4233$ coins $S_2 = 2{,}018.8112$ coins
3. $n_1 > 30$ and $n_2 > 30$: ✓ $n_1 = 93 > 30$ $n_2 = 7266 > 30$

Rejection Critieria:

$\alpha = 0.05$ df = 92



Reject H_o if $t > 1.66$

Test Statistic:

$$t = \frac{(\bar{x}_1 - \bar{x}_2) - (\mu_1 - \mu_2)}{\sqrt{\frac{S_1^2}{N_1} + \frac{S_2^2}{N_2}}}$$

$t = -92.36$
p-value > 0.9999

Inputs:

$\bar{x}_1 = 918.4946$ (coins)
$\bar{x}_2 = 8{,}266.0758$ (coins)
$S_1 = 732.4233$ (coins)
$S_2 = 2{,}018.8112$ (coins)
$n_1 = 93$
$n_2 = 7{,}266$

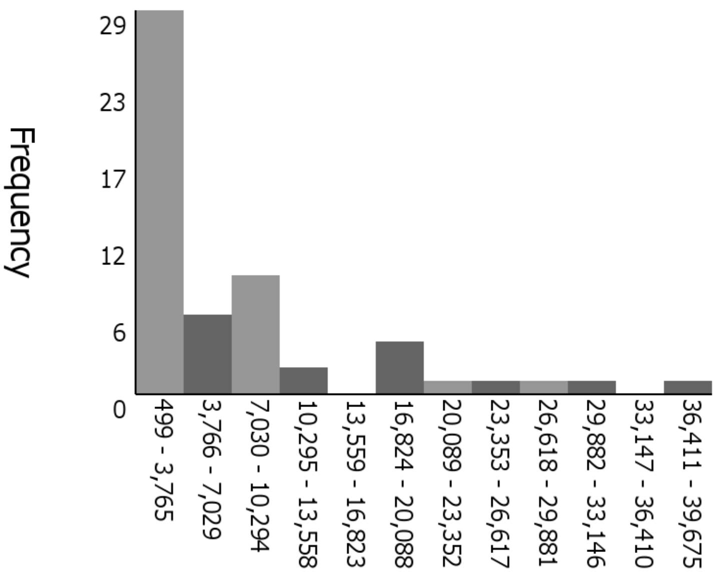
Fail to reject H_o since $-92.36 < 1.66$

There is not significant evidence at the α=0.05 level of significance to support the claim that the mean selling price of a small backpack is greater than the mean cost of the materials required to make it.

Since we failed to reject H_o, it suggests that on average people did not earn more coins from selling this item than it would have cost them to buy the materials.

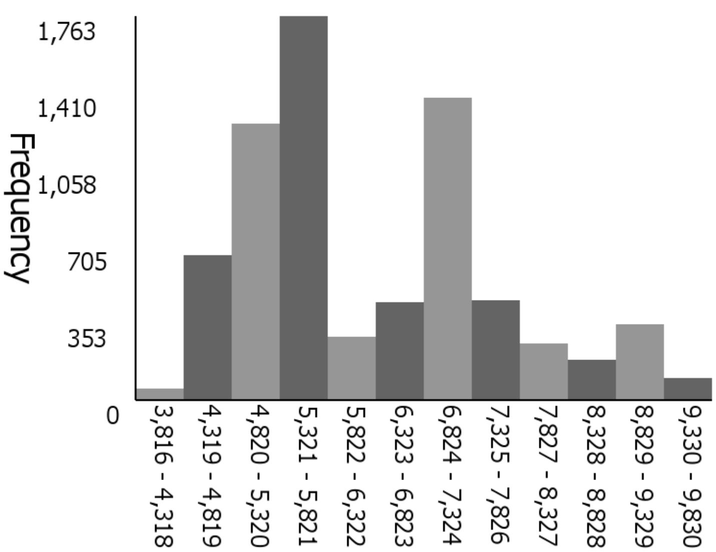
Selling prices and material costs of a red claw talisman

Sell price distribution (outliers omitted)



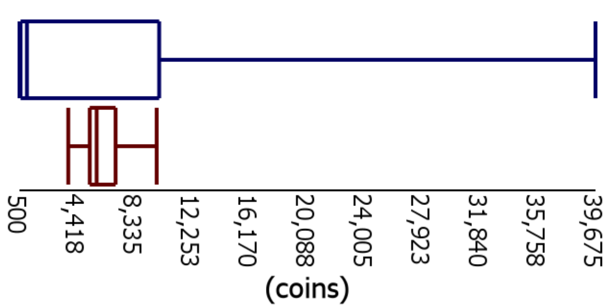
The distribution is centered around 1,005 coins (median). It has a high variability (IQR of 9,425 coins) and is skewed right. There are large gaps between 13,558 - 16,823 coins and 33,146 - 36,410 coins. There are 0 outliers on the low end and 7 outliers on the high end, the highest being 978,000 coins.

Material cost distribution (outliers omitted)

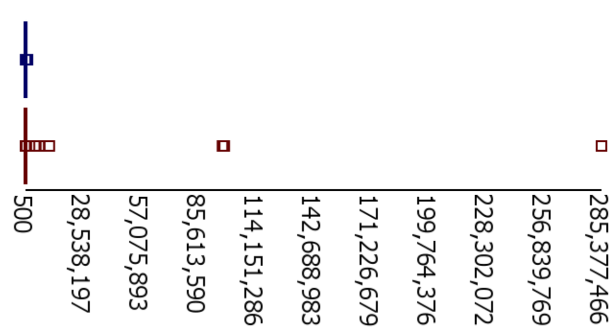


The distribution is centered around 5,748 coins (median). It has a low variability (IQR of 1,757 coins) and is skewed right. There are no large gaps in the distribution. There are 0 outliers on the low end and 262 outliers on the high end, the highest being 285,377,466 coins.

Price and cost distributions (outliers omitted)



Price and cost distributions (outliers included)



Key:
Sell Price
Material Cost

5 number summeries (coins):

min: 500, q1: 575, median: 1,005, q3: 10,000, max: 39,675

min: 3,817, q1: 5,279, median: 5,748, q3: 7,036, max: 9,830

Statistical test comparing the selling prices and material costs of a red claw talisman

Let group1 = Sell prices of a red claw talisman, group2 = Material cost of a red claw talisman
X_1 = Sell price of a red claw talisman (coins), X_2 = Material cost of a red claw talisman (coins)
μ_1 = Mean sell price of a red claw talisman (coins), μ_2 = Mean material cost of a red claw talisman (coins)

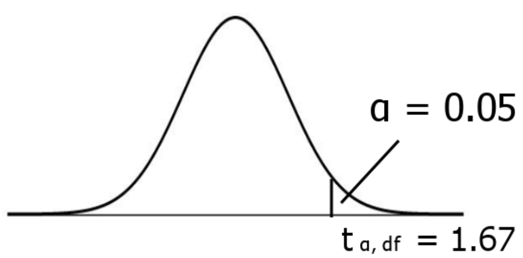
H_o: $\mu_1 = \mu_2$ H_a: $\mu_1 > \mu_2$

Requirements for a difference of means test (σ_1 and σ_2 unknown):

1. 2 independent SRS's: ✓ $n_1 = 55$ $n_2 = 7226$
   One price/cost from either group will not affect any price/cost from either group
2. σ is not known, but S_x is: ✓ $S_1 = 9{,}230.0174$ coins $S_2 = 1{,}279.0266$ coins
3. $n_1 > 30$ and $n_2 > 30$: ✓ $n_1 = 55 > 30$ $n_2 = 7226 > 30$

Rejection Critieria:

$\alpha = 0.05$ df = 54



Reject H_o if $t > 1.67$

Test Statistic:

$$t = \frac{(\bar{x}_1 - \bar{x}_2) - (\mu_1 - \mu_2)}{\sqrt{\frac{S_1^2}{N_1} + \frac{S_2^2}{N_2}}}$$

$t = 0.59$
p-value = 0.2786

Inputs:

$\bar{x}_1 = 7{,}025.1091$ (coins)
$\bar{x}_2 = 6{,}289.7752$ (coins)
$S_1 = 9{,}230.0174$ (coins)
$S_2 = 1{,}279.0266$ (coins)
$n_1 = 55$
$n_2 = 7{,}226$

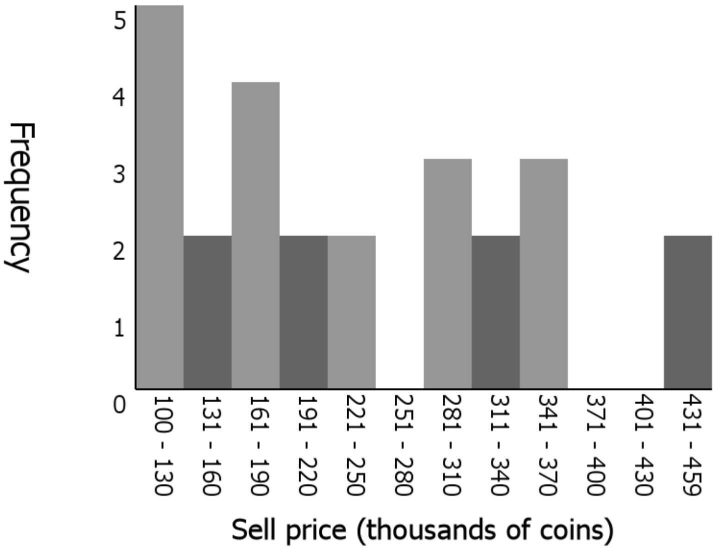
Fail to reject H_o since $0.59 < 1.67$

There is not significant evidence at the α=0.05 level of significance to support the claim that the mean selling price of a red claw talisman is greater than the mean cost of the materials required to make it.

Since we failed to reject H_o, it suggests that on average people did not earn more coins from selling this item than it would have cost them to buy the materials.

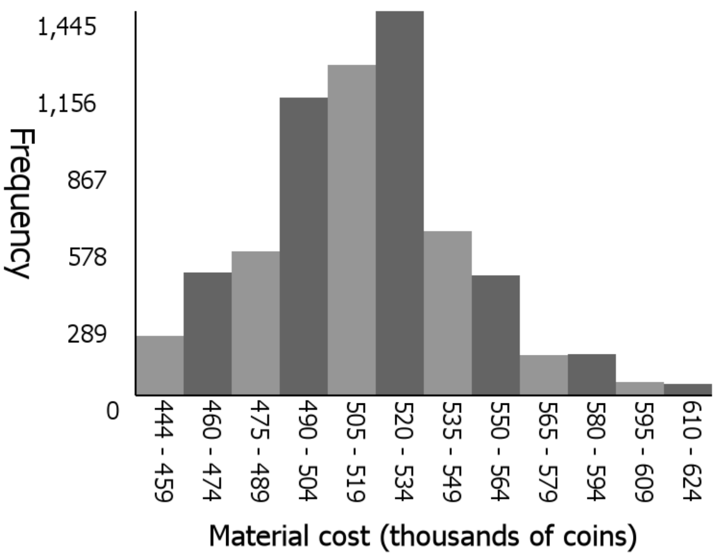
Selling prices and material costs of a protector dragon chestplate

Sell price distribution (outliers omitted)



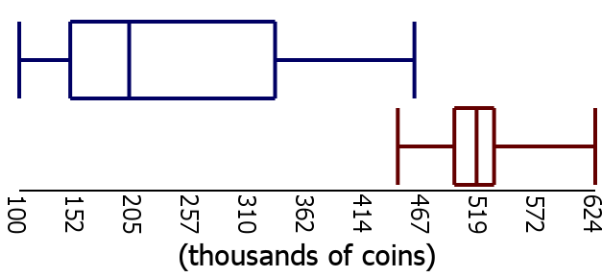
The distribution is centered around 200,000 coins (median). It has a low variability (IQR of 186,340 coins) and is skewed right. There are large gaps between 249,791 - 279,750 coins and 369,624 - 429,541 coins. There are 0 outliers on the low end and 0 outliers on the high end.

Material cost distribution (outliers omitted)

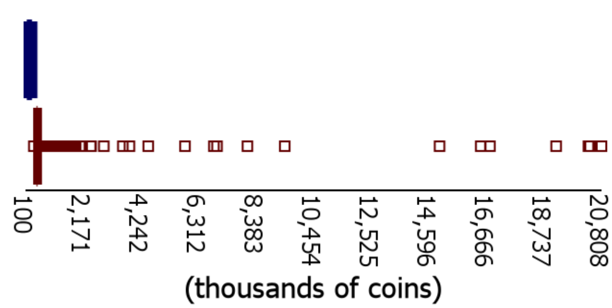


The distribution is centered around 516,050 coins (median). It has a low variability (IQR of 36,129 coins) and is mostly symmetrical. There are no large gaps in the distribution. There are 8 outliers on the low end, the lowest being 399,768 coins and 975 outliers on the high end, the highest being 20,807,927 coins.

Price and cost distributions (outliers omitted)



Price and cost distributions (outliers included)



Key:

Sell Price

Material Cost

5 number summeries (thousands of coins):

min: 100, q1: 146, median: 200, q3: 333, max: 459

min: 444, q1: 496, median: 516, q3: 532, max: 624

Statistical test comparing the selling prices and material costs of a protector dragon chestplate

Let group1 = Sell prices of a protector dragon chestplate, group2 = Material cost of a protector dragon chestplate

X_1 = Sell price of a protector dragon chestplate (coins), X_2 = Material cost of a protector dragon chestplate (coins)

μ_1 = Mean sell price of a protector dragon chestplate (coins),

μ_2 = Mean material cost of a protector dragon chestplate (coins)

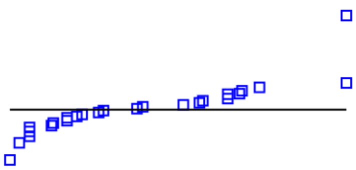
H_o: $\mu_1 = \mu_2$ H_a: $\mu_1 > \mu_2$

Requirements for a difference of means test (σ_1 and σ_2 unknown):

1. 2 independent SRS's: ✓ $n_1 = 25$ $n_2 = 6505$

   One price/cost from either group will not affect any price/cost from either group
2. σ is not known, but S_x is: ✓ S_1 = 108,820.3422 coins S_2 = 31,427.7891 coins
3. Group1 is normally distributed and $n_2 > 30$: ✓

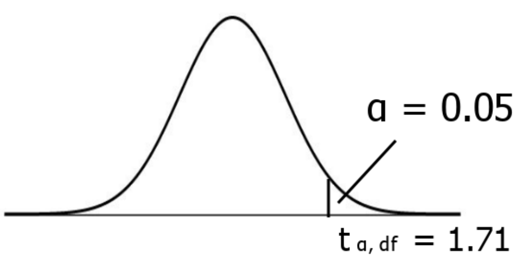
Quantile plot of sell prices



$n_2 = 6505 > 30$

Rejection Critieria:

$\alpha = 0.05$ df = 24



Reject H_o if $t > 1.71$

Test Statistic:

$$t = \frac{(\bar{x}_1 - \bar{x}_2) - (\mu_1 - \mu_2)}{\sqrt{\frac{S_1^2}{N_1} + \frac{S_2^2}{N_2}}}$$

$t = -12.77$

p-value > 0.9999

Inputs:

$\bar{x}_1$ = 237,822.84 (coins)

$\bar{x}_2$ = 515,764.9321 (coins)

S_1 = 108,820.3422 (coins)

S_2 = 31,427.7891 (coins)

$n_1 = 25$

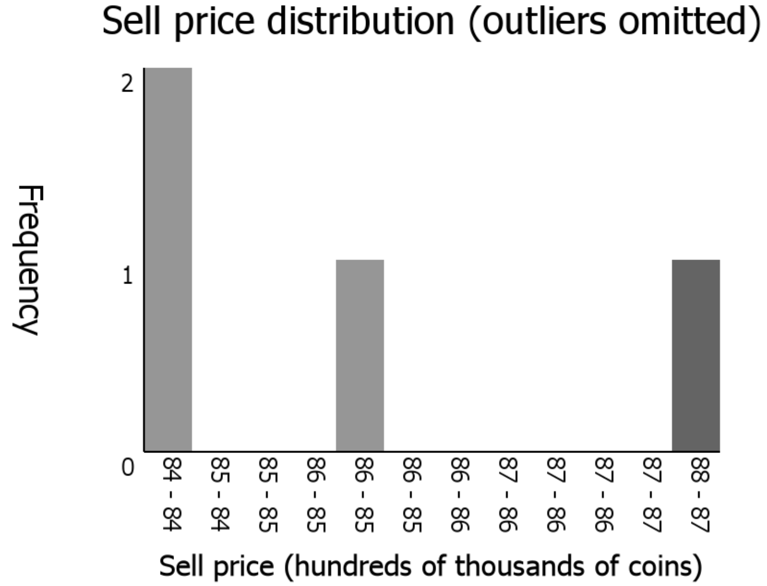
n_2 = 6,505

Fail to reject H_o since $-12.77 < 1.71$

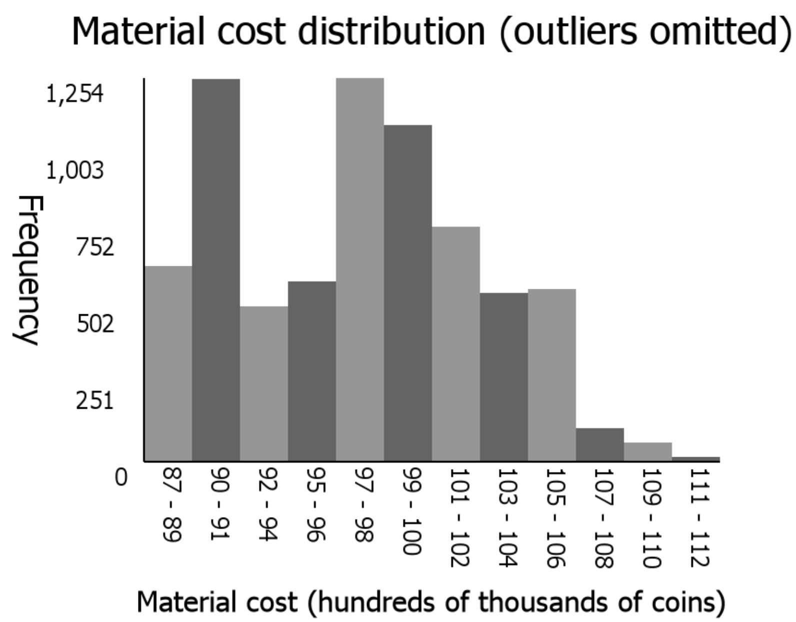
There is not significant evidence at the α=0.05 level of significance to support the claim that the mean selling price of a protector dragon chestplate is greater than the mean cost of the materials required to make it.

Since we failed to reject H_o, it suggests that on average people did not earn more coins from selling this item than it would have cost them to buy the materials.

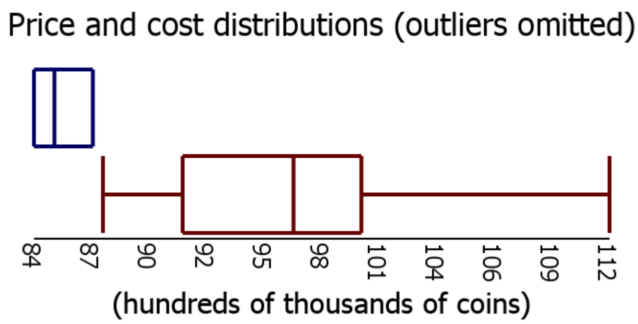
Selling prices and material costs of a superior dragon chestplate

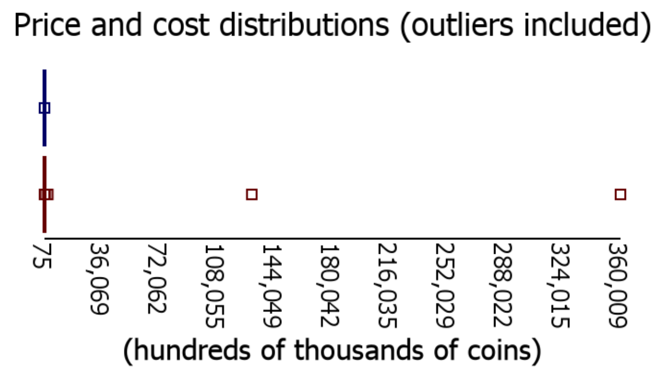


The distribution is centered around 8,500,000 coins (median). It has a low variability (IQR of 287,700 coins) and is mostly symmetrical. There are large gaps between 8,423,975 - 8,495,900 coins and 8,519,875 - 8,663,725 coins. There are 1 outliers on the low end, the lowest being 7,542,596 coins and 1 outliers on the high end, the highest being 9,376,763 coins.



The distribution is centered around 9,668,278 coins (median). It has a low variability (IQR of 873,631 coins) and is mostly symmetrical. There are no large gaps in the distribution. There are 0 outliers on the low end and 69 outliers on the high end, the highest being 36,000,874,544 coins.





Key:

Sell Price

Material Cost

5 number summeries (hundreds of thousands of coins):

min: 84, q1: 84, median: 85, q3: 87, max: 87

min: 87, q1: 91, median: 97, q3: 100, max: 112

Statistical test comparing the selling prices and material costs of a superior dragon chestplate

Let group1 = Sell prices of a superior dragon chestplate, group2 = Material cost of a superior dragon chestplate

X_1 = Sell price of a superior dragon chestplate (coins), X_2 = Material cost of a superior dragon chestplate (coins)

μ_1 = Mean sell price of a superior dragon chestplate (coins),

μ_2 = Mean material cost of a superior dragon chestplate (coins)

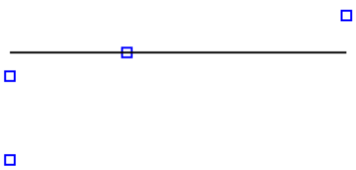
H_o: $\mu_1 = \mu_2$ H_a: $\mu_1 > \mu_2$

Requirements for a difference of means test (σ_1 and σ_2 unknown):

1. 2 independent SRS's: ✓ $n_1 = 4$ $n_2 = 7419$

   One price/cost from either group will not affect any price/cost from either group
2. σ is not known, but S_x is: ✓ S_1 = 135,638.5731 coins S_2 = 531,036.2739 coins
3. Group1 is normally distributed and $n_2 > 30$: ✓

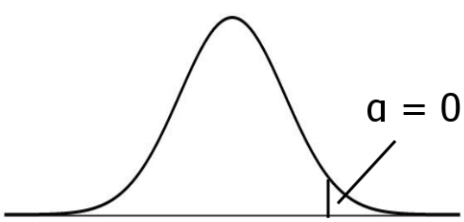
Quantile plot of sell prices



$n_2 = 7419 > 30$

Rejection Critieria:

$\alpha = 0.05$ df = 3



Reject H_o if $t > 2.35$

Test Statistic:

$$t = \frac{(\bar{x}_1 - \bar{x}_2) - (\mu_1 - \mu_2)}{\sqrt{\frac{S_1^2}{N_1} + \frac{S_2^2}{N_2}}}$$

$t = -16.82$

p-value = 0.9998

Inputs:

$\bar{x}_1$ = 8,496,925 (coins)

$\bar{x}_2$ = 9,642,128.505 (coins)

S_1 = 135,638.5731 (coins)

S_2 = 531,036.2739 (coins)

$n_1 = 4$

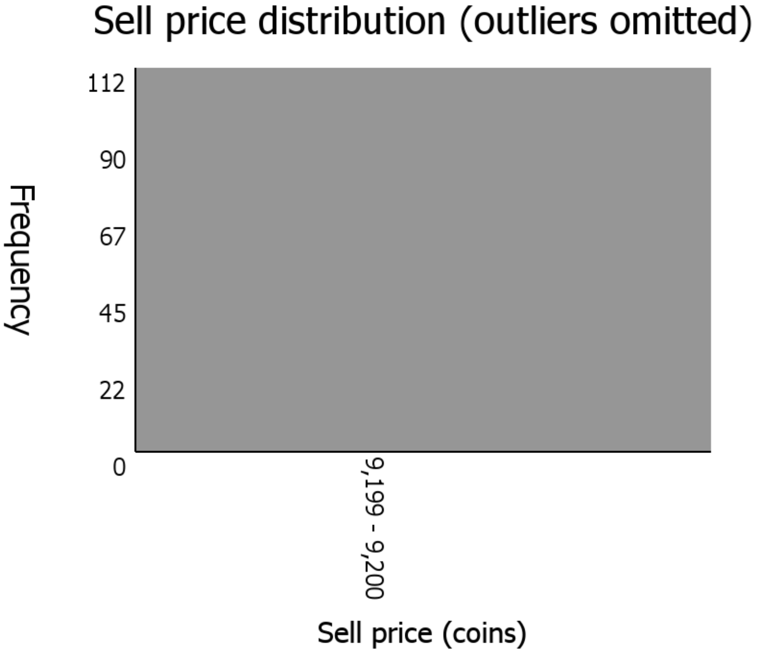
n_2 = 7,419

Fail to reject H_o since $-16.82 < 2.35$

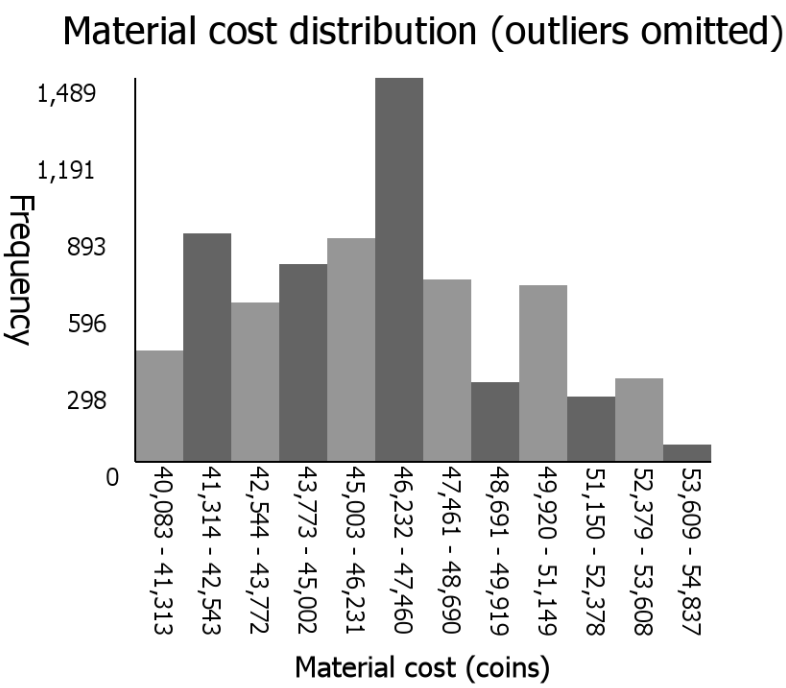
There is not significant evidence at the α=0.05 level of significance to support the claim that the mean selling price of a superior dragon chestplate is greater than the mean cost of the materials required to make it.

Since we failed to reject H_o, it suggests that on average people did not earn more coins from selling this item than it would have cost them to buy the materials.

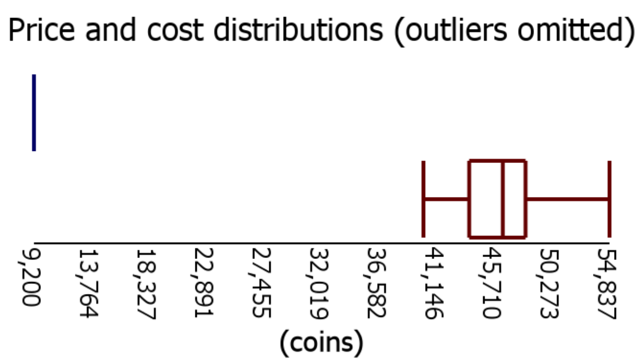
Selling prices and material costs of a farm armor helmet

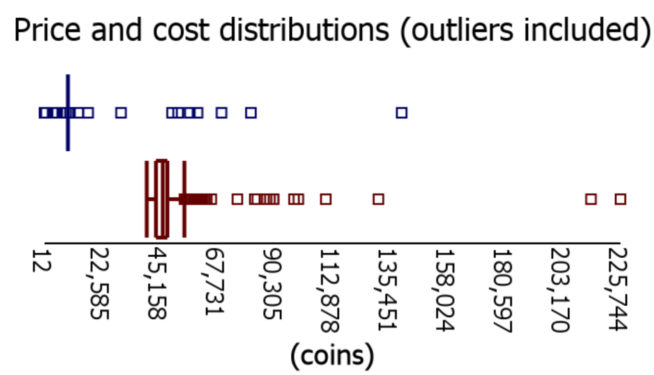


The distribution is centered around 9,200 coins (median). It has a low variability (IQR of 0 coins) and is mostly symmetrical. There are no large gaps in the distribution. There are 18 outliers on the low end, the lowest being 12 coins and 12 outliers on the high end, the highest being 140,000 coins.



The distribution is centered around 46,375 coins (median). It has a low variability (IQR of 4,468 coins) and is mostly symmetrical. There are no large gaps in the distribution. There are 0 outliers on the low end and 89 outliers on the high end, the highest being 225,744 coins.





Key:

Sell Price

Material Cost

5 number summeries (coins):

min: 9,200, q1: 9,200, median: 9,200, q3: 9,200, max: 9,200

min: 40,084, q1: 43,710, median: 46,375, q3: 48,178, max: 54,837

Statistical test comparing the selling prices and material costs of a <u>farm armor helmet</u>

Let group1 = Sell prices of a farm armor helmet, group2 = Material cost of a farm armor helmet
X_1 = Sell price of a farm armor helmet (coins), X_2 = Material cost of a farm armor helmet (coins)
μ_1 = Mean sell price of a farm armor helmet (coins), μ_2 = Mean material cost of a farm armor helmet (coins)

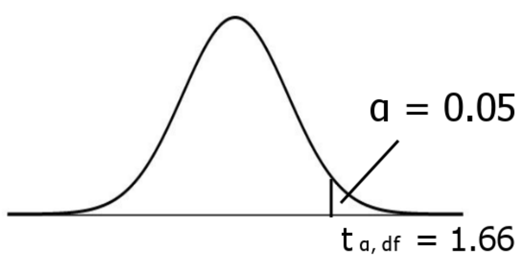
H_o: $\mu_1 = \mu_2$ $\quad$ H_a: $\mu_1 > \mu_2$

<u>Requirements for a difference of means test (σ_1 and σ_2 unknown):</u>

1. 2 independent SRS's: ✓ $n_1 = 112$ $n_2 = 7399$
   One price/cost from either group will not affect any price/cost from either group
2. σ is not known, but S_x is: ✓ $S_1 = 0$ coins $S_2 = 3{,}369.89$ coins
3. $n_1 > 30$ and $n_2 > 30$: ✓ $n_1 = 112 > 30$ $n_2 = 7399 > 30$

<u>Rejection Critieria:</u>

$\alpha = 0.05$ df = 111



Reject H_o if $t > 1.66$

<u>Test Statistic:</u>

$$t = \frac{(\bar{x}_1 - \bar{x}_2) - (\mu_1 - \mu_2)}{\sqrt{\frac{S_1^2}{N_1} + \frac{S_2^2}{N_2}}}$$

$t = -945.67$
p-value > 0.9999

Inputs:

$\bar{x}_1 = 9{,}200$ (coins)
$\bar{x}_2 = 46{,}248.2899$ (coins)
$S_1 = 0$ (coins)
$S_2 = 3{,}369.89$ (coins)
$n_1 = 112$
$n_2 = 7{,}399$

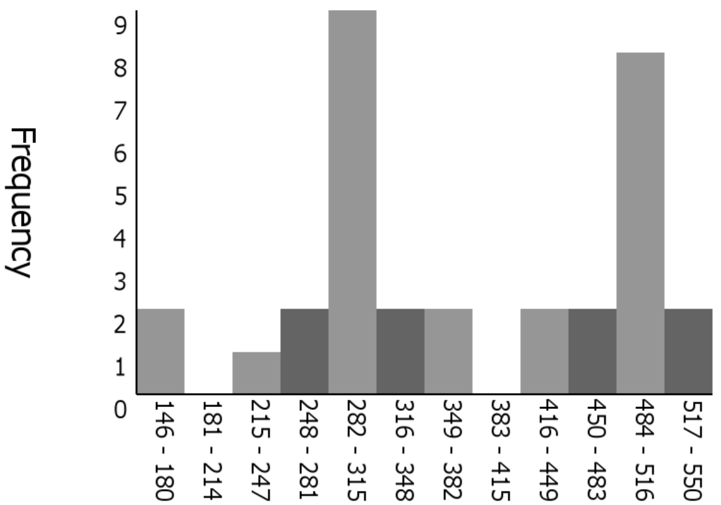
Fail to reject H_o since $-945.67 < 1.66$

There is not significant evidence at the $\alpha=0.05$ level of significance to support the claim that the mean selling price of a farm armor helmet is greater than the mean cost of the materials required to make it.

Since we failed to reject H_o, it suggests that on average people did not earn more coins from selling this item than it would have cost them to buy the materials.

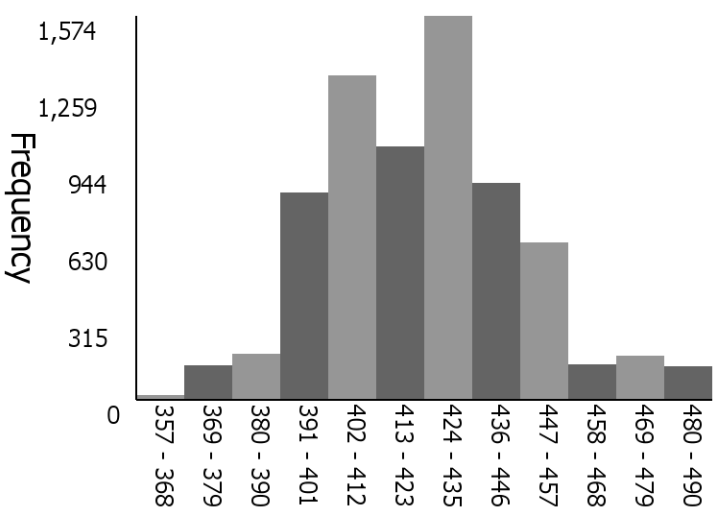
Selling prices and material costs of a young dragon leggings

Sell price distribution (outliers omitted)



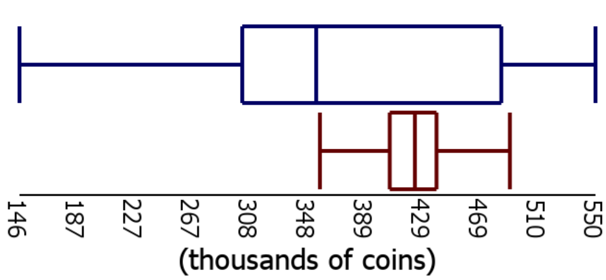
The distribution is centered around 354,312 coins (median). It has a low variability (IQR of 181,500 coins) and is skewed right. There are large gaps between 180,043 - 213,675 coins and 381,838 - 415,470 coins. There are 0 outliers on the low end and 2 outliers on the high end, the highest being 100,000,000 coins.

Material cost distribution (outliers omitted)

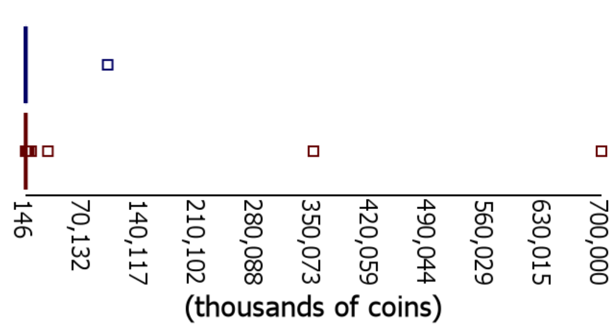


The distribution is centered around 423,458 coins (median). It has a low variability (IQR of 32,795 coins) and is mostly symmetrical. There are no large gaps in the distribution. There are 3 outliers on the low end, the lowest being 355,892 coins and 345 outliers on the high end, the highest being 699,999,909 coins.

Price and cost distributions (outliers omitted)



Price and cost distributions (outliers included)



Key:

Sell Price

Material Cost

5 number summeries (thousands of coins):

min: 146, q1: 303, median: 354, q3: 484, max: 550

min: 357, q1: 406, median: 423, q3: 439, max: 490

Statistical test comparing the selling prices and material costs of a young dragon leggings

Let group1 = Sell prices of a young dragon leggings, group2 = Material cost of a young dragon leggings

X_1 = Sell price of a young dragon leggings (coins), X_2 = Material cost of a young dragon leggings (coins)

μ_1 = Mean sell price of a young dragon leggings (coins),

μ_2 = Mean material cost of a young dragon leggings (coins)

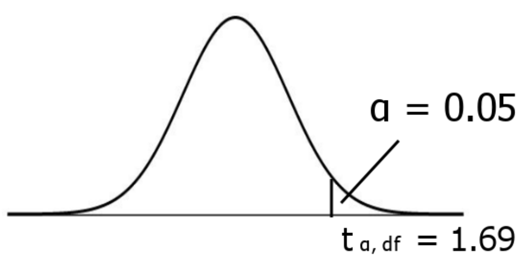
H_o: $\mu_1 = \mu_2$ H_a: $\mu_1 > \mu_2$

Requirements for a difference of means test (σ_1 and σ_2 unknown):

1. 2 independent SRS's: ✓ $n_1 = 32$ $n_2 = 7140$
   One price/cost from either group will not affect any price/cost from either group
2. σ is not known, but S_x is: ✓ S_1 = 111,698.6952 coins S_2 = 22,647.2748 coins
3. $n_1 > 30$ and $n_2 > 30$: ✓ $n_1 = 32 > 30$ $n_2 = 7140 > 30$

Rejection Critieria:

$\alpha = 0.05$ df = 31



Reject H_o if $t > 1.69$

Test Statistic:

$$t = \frac{(\bar{x}_1 - \bar{x}_2) - (\mu_1 - \mu_2)}{\sqrt{\frac{S_1^2}{N_1} + \frac{S_2^2}{N_2}}}$$

$t = -2.38$

p-value = 0.9881

Fail to reject H_o since $-2.38 < 1.69$

Inputs:

$\bar{x}_1$ = 376,485.3438 (coins)

$\bar{x}_2$ = 423,456.2063 (coins)

S_1 = 111,698.6952 (coins)

S_2 = 22,647.2748 (coins)

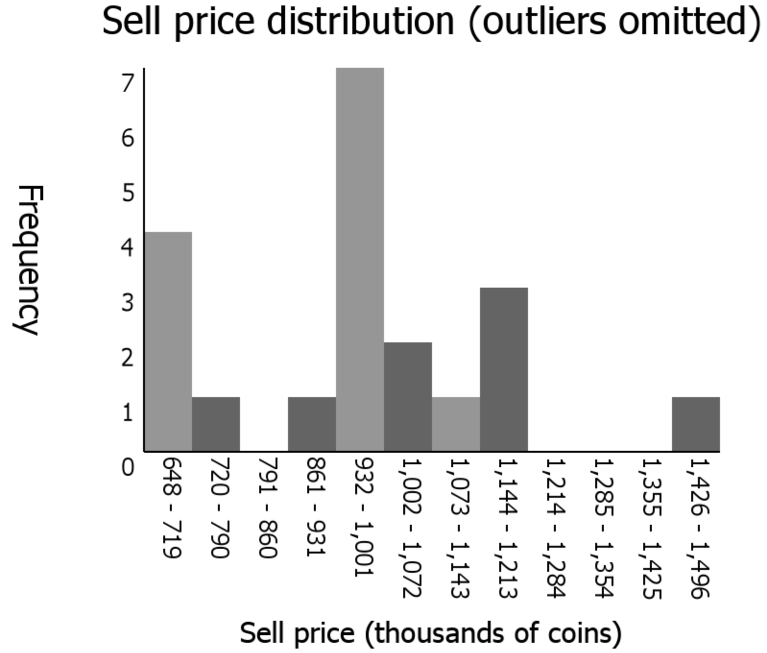
$n_1 = 32$

n_2 = 7,140

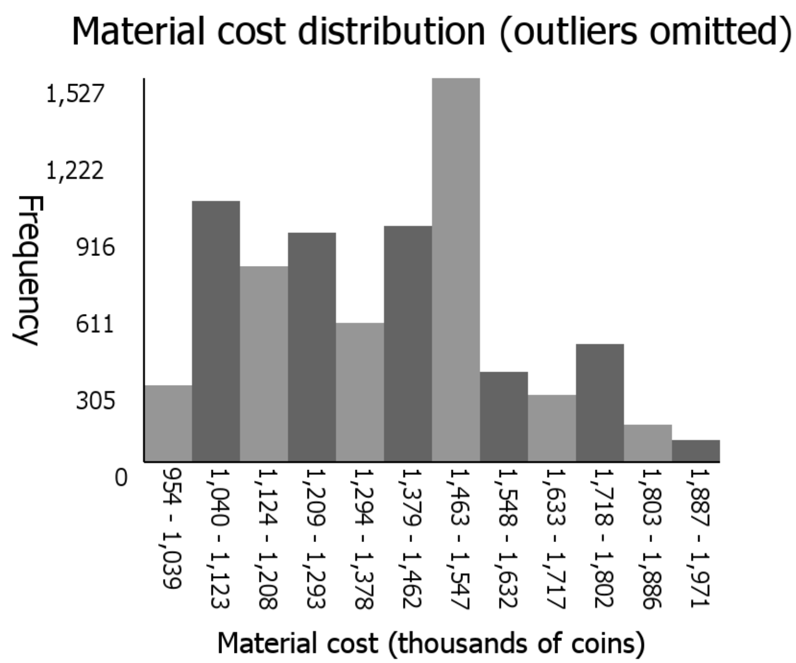
There is not significant evidence at the α=0.05 level of significance to support the claim that the mean selling price of a young dragon leggings is greater than the mean cost of the materials required to make it.

Since we failed to reject H_o, it suggests that on average people did not earn more coins from selling this item than it would have cost them to buy the materials.

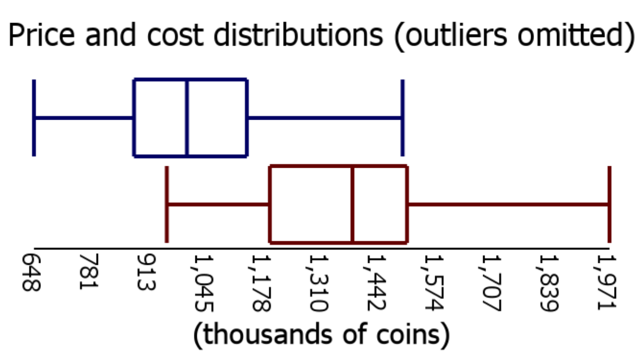
Selling prices and material costs of a wise dragon helmet

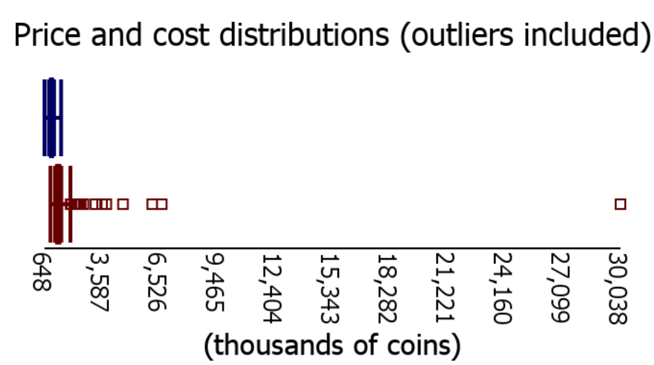


The distribution is centered around 1,000,000 coins (median). It has a low variability (IQR of 259,188 coins) and is mostly symmetrical. There are large gaps between 789,641 - 860,242 coins and 1,213,251 - 1,425,056 coins. There are 0 outliers on the low end and 0 outliers on the high end.



The distribution is centered around 1,380,387 coins (median). It has a low variability (IQR of 315,270 coins) and is mostly symmetrical. There are no large gaps in the distribution. There are 0 outliers on the low end and 100 outliers on the high end, the highest being 30,037,570 coins.





Key:

Sell Price

Material Cost

5 number summeries (thousands of coins):

min: 648, q1: 878, median: 1,000, q3: 1,138, max: 1,496

min: 954, q1: 1,190, median: 1,380, q3: 1,506, max: 1,971

Statistical test comparing the selling prices and material costs of a wise dragon helmet

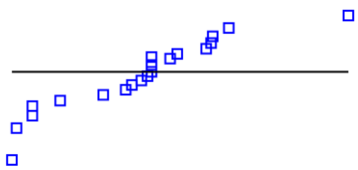
Let group1 = Sell prices of a wise dragon helmet, group2 = Material cost of a wise dragon helmet
X_1 = Sell price of a wise dragon helmet (coins), X_2 = Material cost of a wise dragon helmet (coins)
μ_1 = Mean sell price of a wise dragon helmet (coins), μ_2 = Mean material cost of a wise dragon helmet (coins)

H_o: $\mu_1 = \mu_2$ H_a: $\mu_1 > \mu_2$

Requirements for a difference of means test (σ_1 and σ_2 unknown):

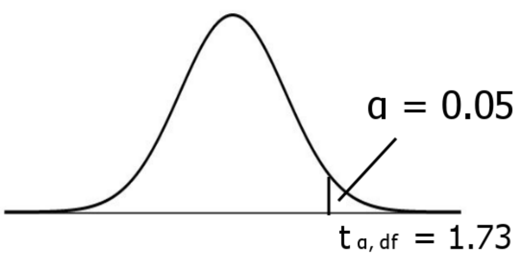
1. 2 independent SRS's: ✓ $n_1 = 20$ $n_2 = 7388$
   One price/cost from either group will not affect any price/cost from either group
2. σ is not known, but S_x is: ✓ S_1 = 209,550.0546 coins S_2 = 220,163.6988 coins
3. Group1 is normally distributed and $n_2 > 30$: ✓

Quantile plot of sell prices



$n_2 = 7388 > 30$

Rejection Critieria:
$\alpha = 0.05$ df = 19



Reject H_o if $t > 1.73$

Test Statistic:

$$t = \frac{(\bar{x}_1 - \bar{x}_2) - (\mu_1 - \mu_2)}{\sqrt{\frac{S_1^2}{N_1} + \frac{S_2^2}{N_2}}}$$

$t = -8.48$
p-value > 0.9999

Inputs:
$\bar{x}_1$ = 972,515.1 (coins)
$\bar{x}_2$ = 1,370,684.6574 (coins)
S_1 = 209,550.0546 (coins)
S_2 = 220,163.6988 (coins)
n_1 = 20
n_2 = 7,388

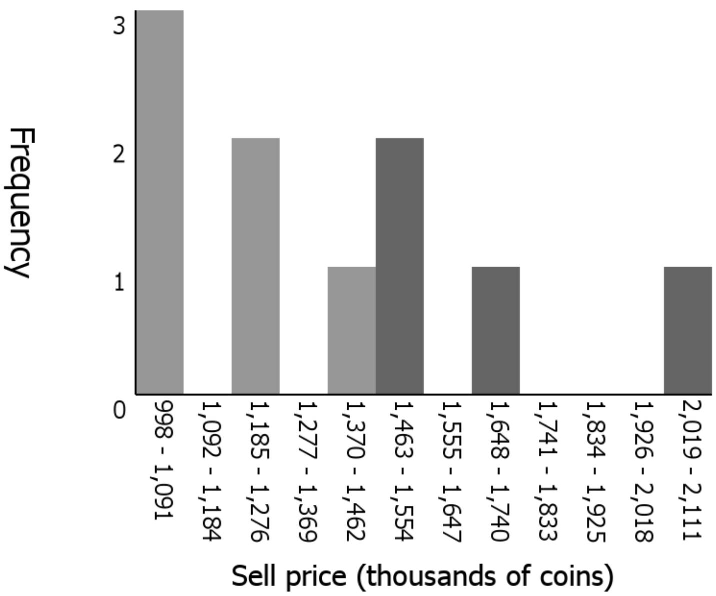
Fail to reject H_o since $-8.48 < 1.73$

There is not significant evidence at the α=0.05 level of significance to support the claim that the mean selling price of a wise dragon helmet is greater than the mean cost of the materials required to make it.

Since we failed to reject H_o, it suggests that on average people did not earn more coins from selling this item than it would have cost them to buy the materials.

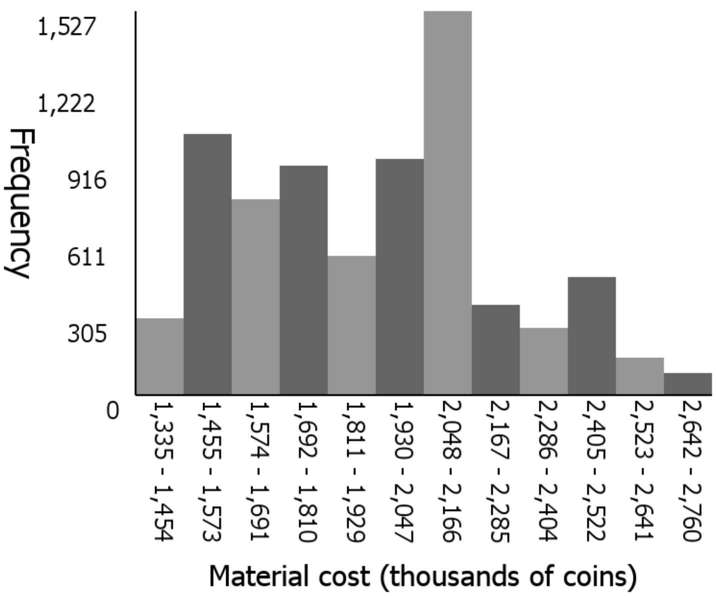
Selling prices and material costs of a wise dragon leggings

Sell price distribution (outliers omitted)



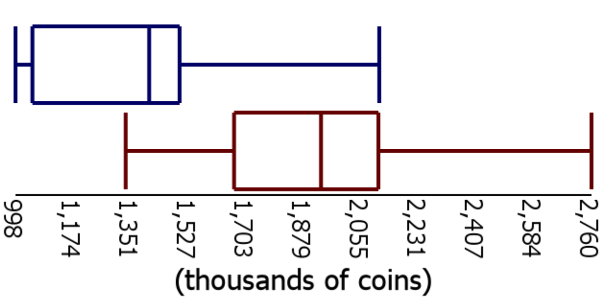
The distribution is centered around 1,407,100 coins (median). It has a low variability (IQR of 450,000 coins) and is mostly symmetrical. There are large gaps between 1,090,950 - 1,183,650 coins, 1,276,350 - 1,369,050 coins, 1,554,451 - 1,647,151 coins, and 1,739,851 - 2,017,951 coins. There are 0 outliers on the low end and 0 outliers on the high end.

Material cost distribution (outliers omitted)

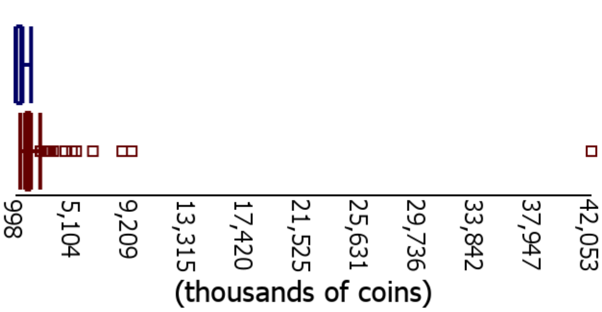


The distribution is centered around 1,932,542 coins (median). It has a low variability (IQR of 441,378 coins) and is mostly symmetrical. There are no large gaps in the distribution. There are 0 outliers on the low end and 100 outliers on the high end, the highest being 42,052,598 coins.

Price and cost distributions (outliers omitted)



Price and cost distributions (outliers included)



Key:

- Sell Price
- Material Cost

5 number summeries (thousands of coins):

min: 998, q1: 1,050, median: 1,407, q3: 1,500, max: 2,111

min: 1,335, q1: 1,667, median: 1,933, q3: 2,108, max: 2,760

Statistical test comparing the selling prices and material costs of a wise dragon leggings

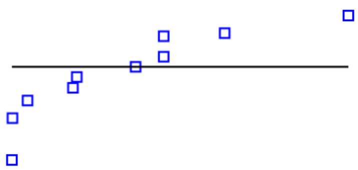
Let group1 = Sell prices of a wise dragon leggings, group2 = Material cost of a wise dragon leggings
X_1 = Sell price of a wise dragon leggings (coins), X_2 = Material cost of a wise dragon leggings (coins)
μ_1 = Mean sell price of a wise dragon leggings (coins), μ_2 = Mean material cost of a wise dragon leggings (coins)

H_o: $\mu_1 = \mu_2$ H_a: $\mu_1 > \mu_2$

Requirements for a difference of means test (σ_1 and σ_2 unknown):

1. 2 independent SRS's: ✓ n_1 = 10 n_2 = 7388
   One price/cost from either group will not affect any price/cost from either group
2. σ is not known, but S_x is: ✓ S_1 = 353,531.1739 coins S_2 = 308,229.1777 coins
3. Group1 is normally distributed and $n_2 > 30$: ✓

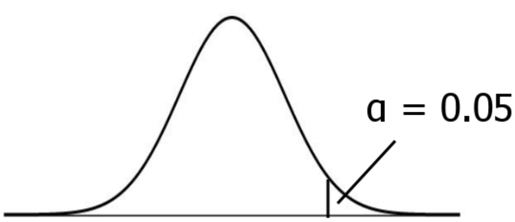
Quantile plot of sell prices



$n_2 = 7388 > 30$

Rejection Critieria:

α = 0.05 df = 9



Reject H_o if t > 1.83

Test Statistic:

$$t = \frac{(\bar{x}_1 - \bar{x}_2) - (\mu_1 - \mu_2)}{\sqrt{\frac{S_1^2}{N_1} + \frac{S_2^2}{N_2}}}$$

t = -4.93
p-value = 0.9996

Inputs:

$\bar{x}_1$ = 1,368,046 (coins)
$\bar{x}_2$ = 1,918,958.4996 (coins)
S_1 = 353,531.1739 (coins)
S_2 = 308,229.1777 (coins)
n_1 = 10
n_2 = 7,388

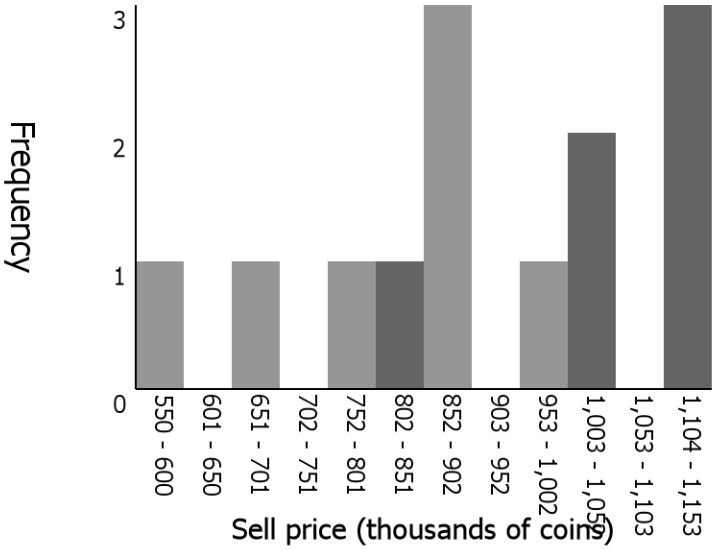
Fail to reject H_o since -4.93 < 1.83

There is not significant evidence at the α=0.05 level of significance to support the claim that the mean selling price of a wise dragon leggings is greater than the mean cost of the materials required to make it.

Since we failed to reject H_o, it suggests that on average people did not earn more coins from selling this item than it would have cost them to buy the materials.

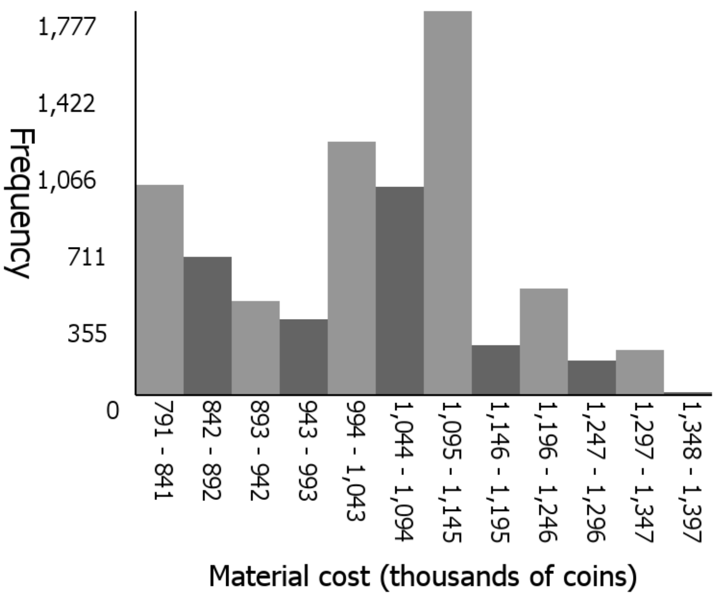
Selling prices and material costs of a strong dragon leggings

Sell price distribution (outliers omitted)



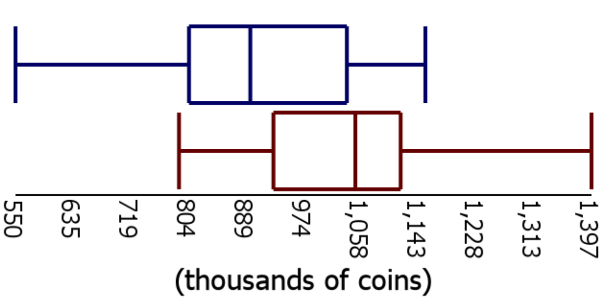
The distribution is centered around 895,433 coins (median). It has a low variability (IQR of 232,242 coins) and is mostly symmetrical. There are large gaps between 600,248 - 650,497 coins, 700,745 - 750,993 coins, 901,738 - 951,986 coins, and 1,052,483 - 1,102,731 coins. There are 0 outliers on the low end and 0 outliers on the high end.

Material cost distribution (outliers omitted)

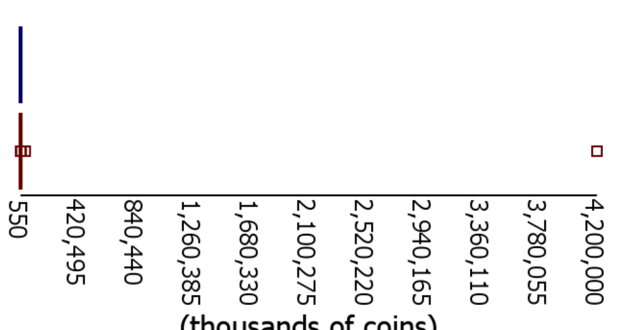


The distribution is centered around 1,050,000 coins (median). It has a low variability (IQR of 187,182 coins) and is mostly symmetrical. There are no large gaps in the distribution. There are 0 outliers on the low end and 70 outliers on the high end, the highest being 4,199,999,992 coins.

Price and cost distributions (outliers omitted)



Price and cost distributions (outliers included)



Key:

Sell Price

Material Cost

5 number summeries (thousands of coins):

min: 550, q1: 805, median: 895, q3: 1,037, max: 1,153

min: 791, q1: 929, median: 1,050, q3: 1,117, max: 1,397

Statistical test comparing the selling prices and material costs of a strong dragon leggings

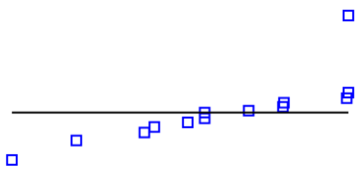
Let group1 = Sell prices of a strong dragon leggings, group2 = Material cost of a strong dragon leggings
X_1 = Sell price of a strong dragon leggings (coins), X_2 = Material cost of a strong dragon leggings (coins)
μ_1 = Mean sell price of a strong dragon leggings (coins),
μ_2 = Mean material cost of a strong dragon leggings (coins)

H_o: $\mu_1 = \mu_2$ H_a: $\mu_1 > \mu_2$

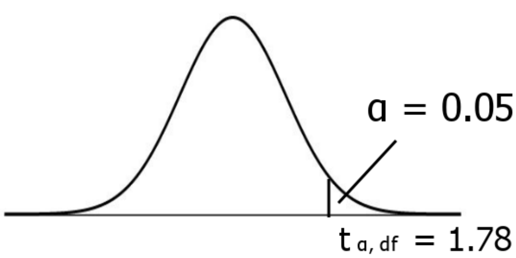
Requirements for a difference of means test (σ_1 and σ_2 unknown):

1. 2 independent SRS's: ✓ $n_1 = 13$ $n_2 = 7418$
   One price/cost from either group will not affect any price/cost from either group
2. σ is not known, but S_x is: ✓ S_1 = 188,909.7199 coins S_2 = 132,929.2697 coins
3. Group1 is normally distributed and $n_2 > 30$: ✓

Quantile plot of sell prices $n_2 = 7418 > 30$



Rejection Critieria:
$\alpha = 0.05$ df = 12



Reject H_o if $t > 1.78$

Test Statistic:

$$t = \frac{(\bar{x}_1 - \bar{x}_2) - (\mu_1 - \mu_2)}{\sqrt{\frac{S_1^2}{N_1} + \frac{S_2^2}{N_2}}}$$

$t = -2.21$
p-value = 0.9763

Inputs:
$\bar{x}_1$ = 920,586.7692 (coins)
$\bar{x}_2$ = 1,036,328.8317 (coins)
S_1 = 188,909.7199 (coins)
S_2 = 132,929.2697 (coins)
n_1 = 13
n_2 = 7,418

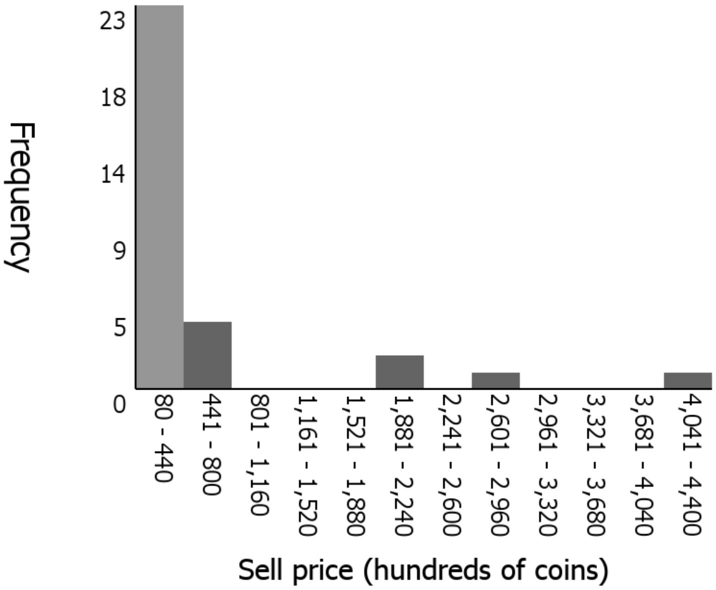
Fail to reject H_o since $-2.21 < 1.78$

There is not significant evidence at the $\alpha=0.05$ level of significance to support the claim that the mean selling price of a strong dragon leggings is greater than the mean cost of the materials required to make it.

Since we failed to reject H_o, it suggests that on average people did not earn more coins from selling this item than it would have cost them to buy the materials.

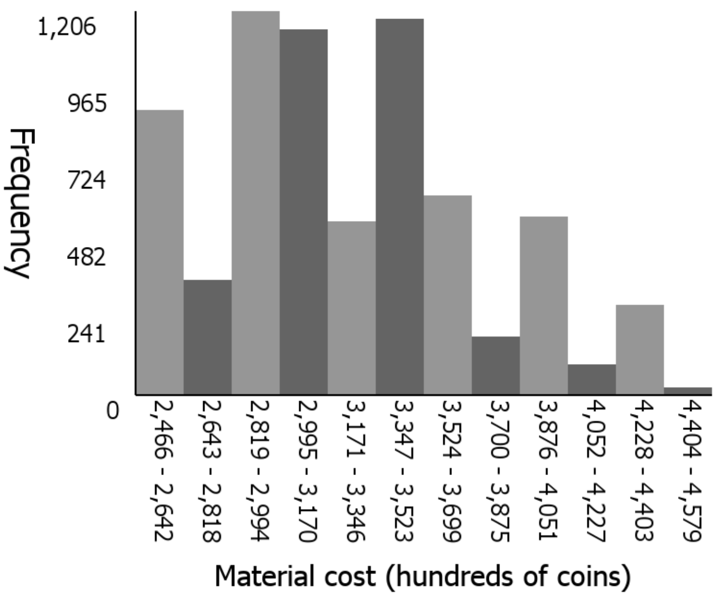
Selling prices and material costs of a magma rod

Sell price distribution (outliers omitted)



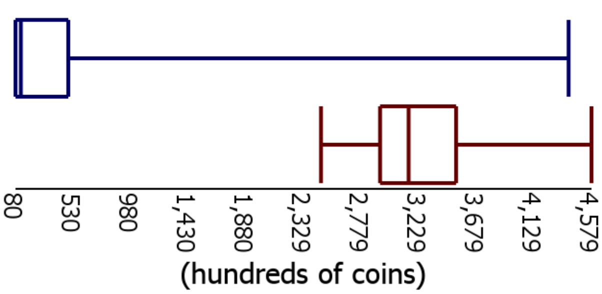
The distribution is centered around 12,167 coins (median). It has a high variability (IQR of 41,225 coins) and is skewed right. There are large gaps between 80,000 - 188,000 coins, 224,000 - 260,000 coins, and 296,000 - 404,000 coins. There are 0 outliers on the low end and 7 outliers on the high end, the highest being 700,000 coins.

Material cost distribution (outliers omitted)

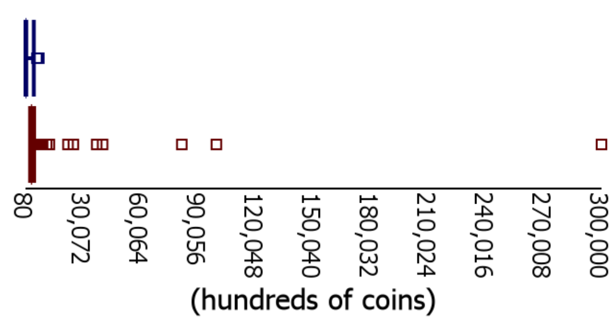


The distribution is centered around 315,049 coins (median). It has a low variability (IQR of 59,375 coins) and is mostly symmetrical. There are no large gaps in the distribution. There are 0 outliers on the low end and 373 outliers on the high end, the highest being 30,000,000 coins.

Price and cost distributions (outliers omitted)



Price and cost distributions (outliers included)



Key:

Sell Price

Material Cost

5 number summeries (hundreds of coins):

min: 80, q1: 80, median: 122, q3: 492, max: 4,400

min: 2,466, q1: 2,927, median: 3,150, q3: 3,521, max: 4,579

Statistical test comparing the selling prices and material costs of a magma rod

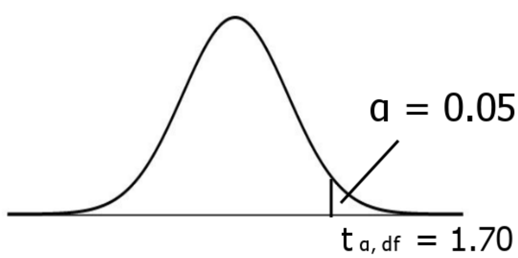
Let group1 = Sell prices of a magma rod, group2 = Material cost of a magma rod
X_1 = Sell price of a magma rod (coins), X_2 = Material cost of a magma rod (coins)
μ_1 = Mean sell price of a magma rod (coins), μ_2 = Mean material cost of a magma rod (coins)

H_o: $\mu_1 = \mu_2$ H_a: $\mu_1 > \mu_2$

Requirements for a difference of means test (σ_1 and σ_2 unknown):

1. 2 independent SRS's: ✓ $n_1 = 31$ $n_2 = 7115$
   One price/cost from either group will not affect any price/cost from either group
2. σ is not known, but S_x is: ✓ S_1 = 96,864.4997 coins S_2 = 46,577.1319 coins
3. $n_1 > 30$ and $n_2 > 30$: ✓ $n_1 = 31 > 30$ $n_2 = 7115 > 30$

Rejection Critieria:
$\alpha = 0.05$ df = 30



Reject H_o if $t > 1.70$

Test Statistic:

$$t = \frac{(\bar{x}_1 - \bar{x}_2) - (\mu_1 - \mu_2)}{\sqrt{\frac{S_1^2}{N_1} + \frac{S_2^2}{N_2}}}$$

Inputs:
$\bar{x}_1$ = 51,854.5484 (coins)
$\bar{x}_2$ = 325,128.5308 (coins)
S_1 = 96,864.4997 (coins)
S_2 = 46,577.1319 (coins)
$n_1 = 31$
n_2 = 7,115

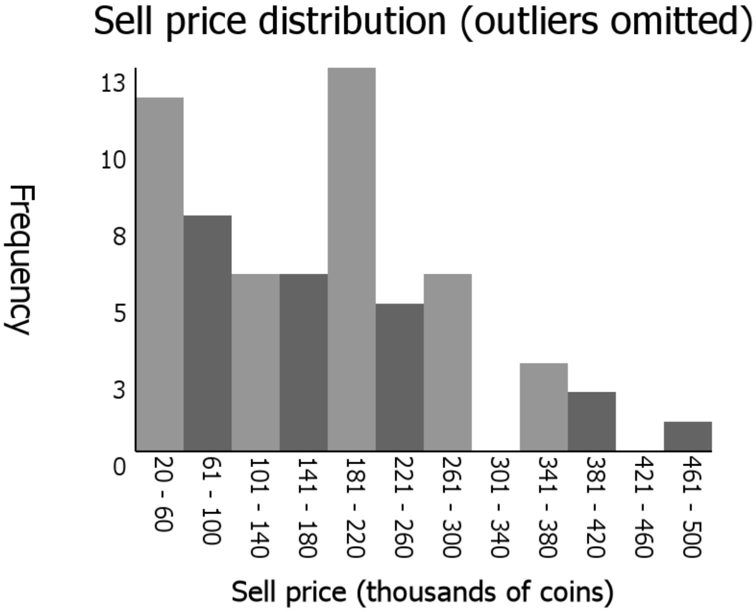
$t = -15.70$
p-value > 0.9999

Fail to reject H_o since $-15.70 < 1.70$

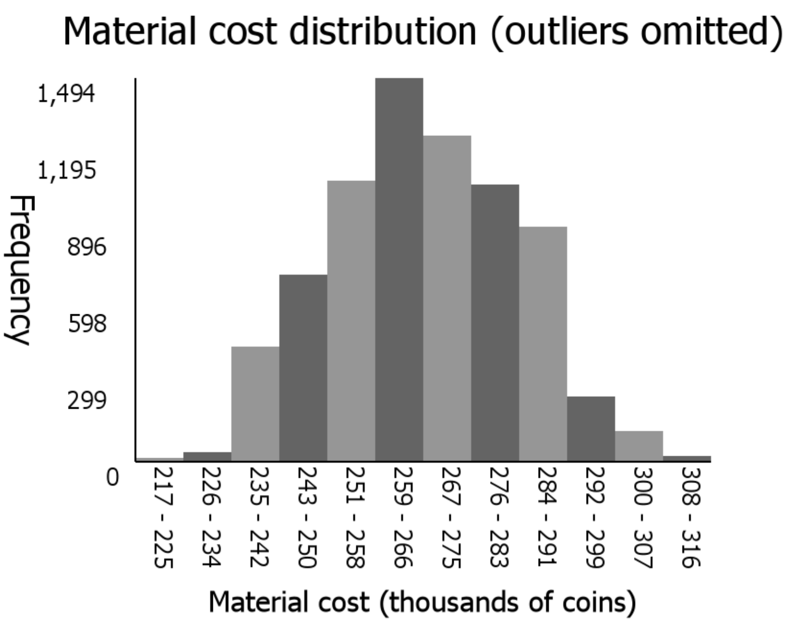
There is not significant evidence at the α=0.05 level of significance to support the claim that the mean selling price of a magma rod is greater than the mean cost of the materials required to make it.

Since we failed to reject H_o, it suggests that on average people did not earn more coins from selling this item than it would have cost them to buy the materials.

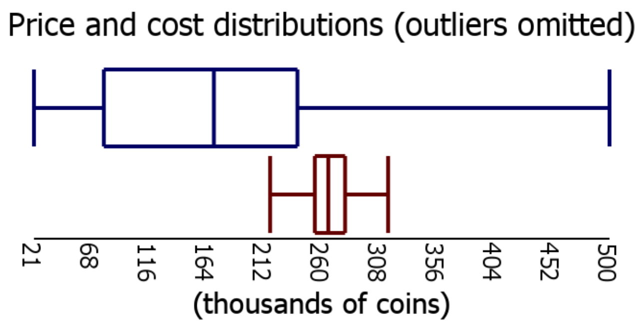
Selling prices and material costs of a haste ring

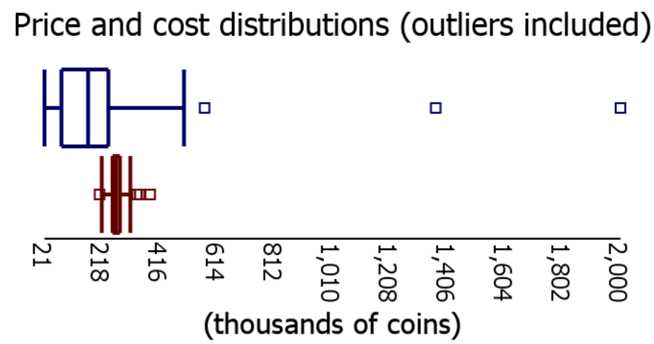


The distribution is centered around 170,392 coins (median). It has a low variability (IQR of 161,294 coins) and is mostly symmetrical. There are large gaps between 300,208 - 340,167 coins and 420,083 - 460,042 coins. There are 0 outliers on the low end and 3 outliers on the high end, the highest being 2,000,000 coins.



The distribution is centered around 265,702 coins (median). It has a low variability (IQR of 25,239 coins) and is mostly symmetrical. There are no large gaps in the distribution. There are 1 outliers on the low end, the lowest being 209,934 coins and 10 outliers on the high end, the highest being 383,816 coins.





Key:
Sell Price
Material Cost

5 number summeries (thousands of coins):

min: 21, q1: 79, median: 170, q3: 240, max: 500

min: 217, q1: 254, median: 266, q3: 280, max: 316

Statistical test comparing the selling prices and material costs of a haste ring

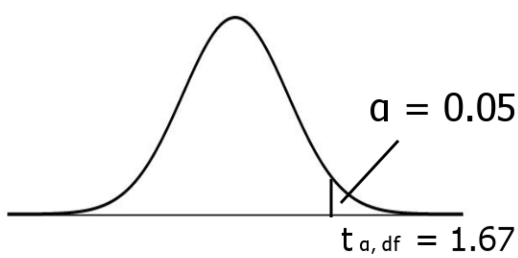
Let group1 = Sell prices of a haste ring, group2 = Material cost of a haste ring
X_1 = Sell price of a haste ring (coins), X_2 = Material cost of a haste ring (coins)
μ_1 = Mean sell price of a haste ring (coins), μ_2 = Mean material cost of a haste ring (coins)

H_o: $\mu_1 = \mu_2$ H_a: $\mu_1 > \mu_2$

Requirements for a difference of means test (σ_1 and σ_2 unknown):

1. 2 independent SRS's: ✓ $n_1 = 62$ $n_2 = 7477$
   One price/cost from either group will not affect any price/cost from either group
2. σ is not known, but S_x is: ✓ $S_1 = 110{,}256.5493$ coins $S_2 = 15{,}903.7122$ coins
3. $n_1 > 30$ and $n_2 > 30$: ✓ $n_1 = 62 > 30$ $n_2 = 7477 > 30$

Rejection Critieria:
$\alpha = 0.05$ df = 61



Reject H_o if $t > 1.67$

Test Statistic:

$$t = \frac{(\bar{x}_1 - \bar{x}_2) - (\mu_1 - \mu_2)}{\sqrt{\frac{S_1^2}{N_1} + \frac{S_2^2}{N_2}}}$$

$t = -6.83$
p-value > 0.9999

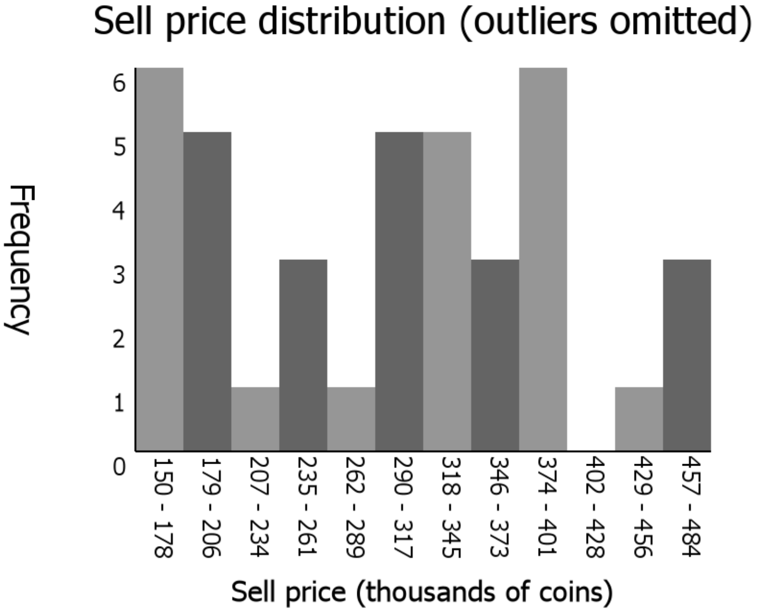
Inputs:
$\bar{x}_1 = 171{,}129.8548$ (coins)
$\bar{x}_2 = 266{,}764.2678$ (coins)
$S_1 = 110{,}256.5493$ (coins)
$S_2 = 15{,}903.7122$ (coins)
$n_1 = 62$
$n_2 = 7{,}477$

Fail to reject H_o since $-6.83 < 1.67$

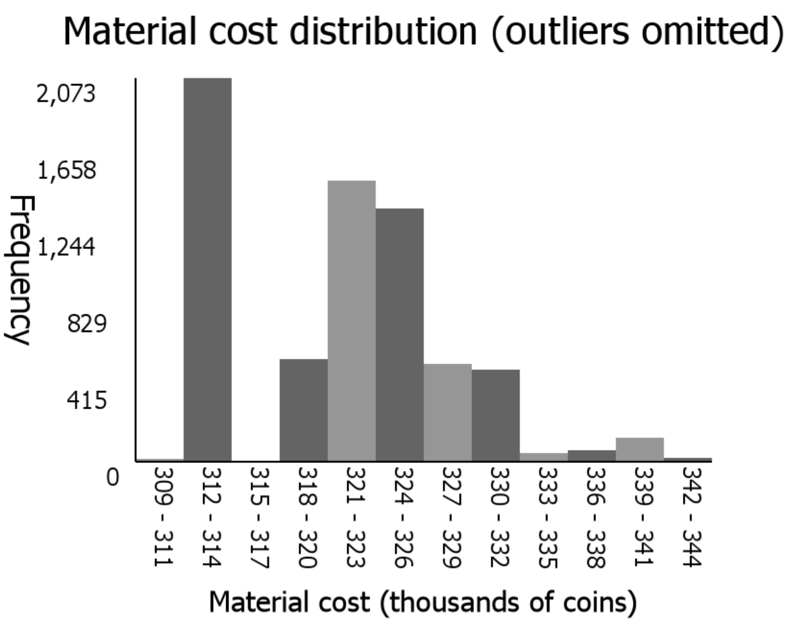
There is not significant evidence at the α=0.05 level of significance to support the claim that the mean selling price of a haste ring is greater than the mean cost of the materials required to make it.

Since we failed to reject H_o, it suggests that on average people did not earn more coins from selling this item than it would have cost them to buy the materials.

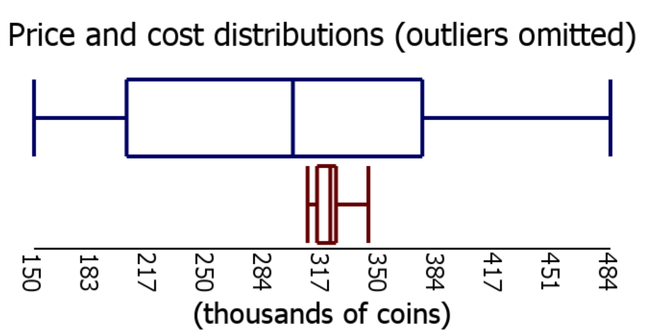
Selling prices and material costs of an emerald blade

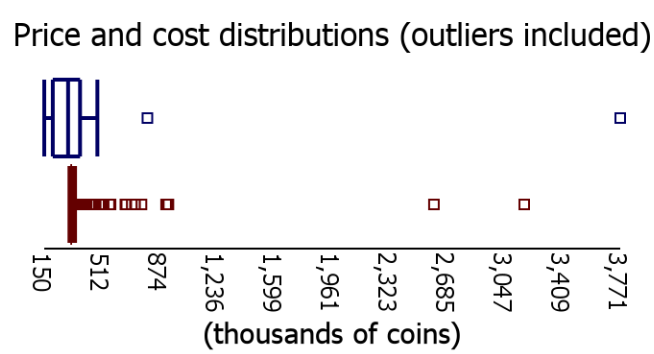


The distribution is centered around 300,000 coins (median). It has a low variability (IQR of 171,357 coins) and is mostly symmetrical. There is a large gap between 400,500 - 428,333 coins. There are 0 outliers on the low end and 2 outliers on the high end, the highest being 3,771,301 coins.



The distribution is centered around 321,672 coins (median). It has a low variability (IQR of 11,001 coins) and is mostly symmetrical. There is a large gap between 314,375 - 317,312 coins. There are 0 outliers on the low end and 674 outliers on the high end, the highest being 3,167,712 coins.





Key:

Sell Price

Material Cost

5 number summeries (thousands of coins):

min: 150, q1: 204, median: 300, q3: 375, max: 484

min: 309, q1: 314, median: 322, q3: 325, max: 344

Statistical test comparing the selling prices and material costs of an emerald blade

Let group1 = Sell prices of an emerald blade, group2 = Material cost of an emerald blade
X_1 = Sell price of an emerald blade (coins), X_2 = Material cost of an emerald blade (coins)
μ_1 = Mean sell price of an emerald blade (coins), μ_2 = Mean material cost of an emerald blade (coins)

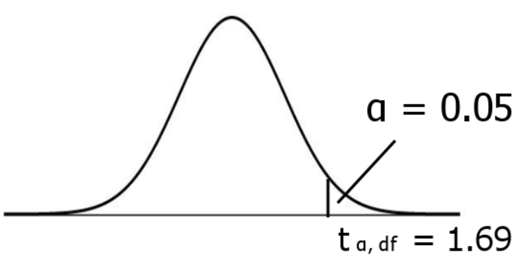
H_o: $\mu_1 = \mu_2$ H_a: $\mu_1 > \mu_2$

Requirements for a difference of means test (σ_1 and σ_2 unknown):

1. 2 independent SRS's: ✓ $n_1 = 39$ $n_2 = 6814$
   One price/cost from either group will not affect any price/cost from either group
2. σ is not known, but S_x is: ✓ $S_1 = 100{,}211.5325$ coins $S_2 = 6{,}393.6898$ coins
3. $n_1 > 30$ and $n_2 > 30$: ✓ $n_1 = 39 > 30$ $n_2 = 6814 > 30$

Rejection Critieria:

$\alpha = 0.05$ df = 38



Reject H_o if $t > 1.69$

Test Statistic:

$$t = \frac{(\bar{x}_1 - \bar{x}_2) - (\mu_1 - \mu_2)}{\sqrt{\frac{S_1^2}{N_1} + \frac{S_2^2}{N_2}}}$$

$t = -1.55$
p-value = 0.9355

Inputs:

$\bar{x}_1 = 296{,}209.1538$ (coins)
$\bar{x}_2 = 321{,}109.4013$ (coins)
$S_1 = 100{,}211.5325$ (coins)
$S_2 = 6{,}393.6898$ (coins)
$n_1 = 39$
$n_2 = 6{,}814$

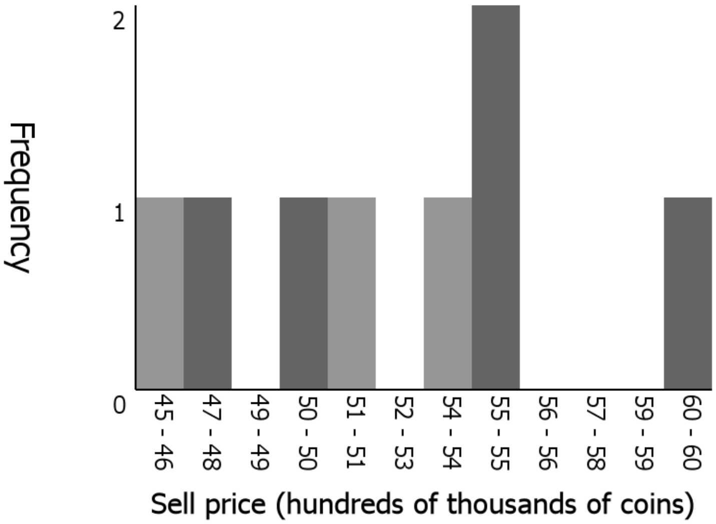
Fail to reject H_o since $-1.55 < 1.69$

There is not significant evidence at the α=0.05 level of significance to support the claim that the mean selling price of an emerald blade is greater than the mean cost of the materials required to make it.

Since we failed to reject H_o, it suggests that on average people did not earn more coins from selling this item than it would have cost them to buy the materials.

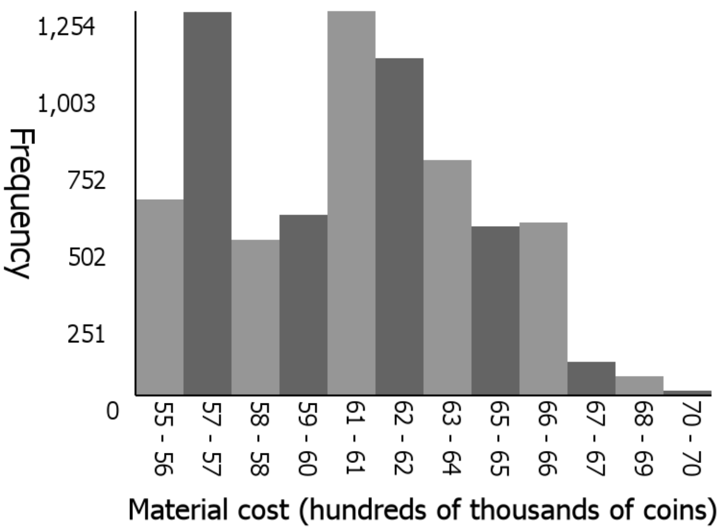
Selling prices and material costs of a superior dragon helmet

Sell price distribution (outliers omitted)



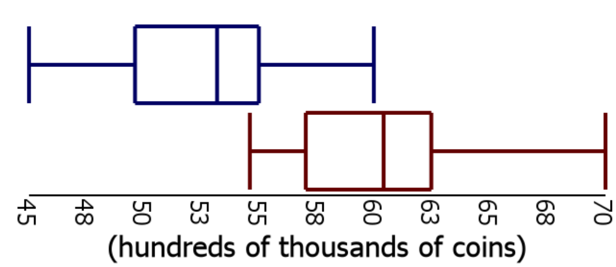
The distribution is centered around 5,318,067 coins (median). It has a low variability (IQR of 538,750 coins) and is mostly symmetrical. There are large gaps between 4,750,000 - 4,875,000 coins, 5,125,000 - 5,250,000 coins, and 5,500,000 - 5,875,000 coins. There are 0 outliers on the low end and 0 outliers on the high end.

Material cost distribution (outliers omitted)

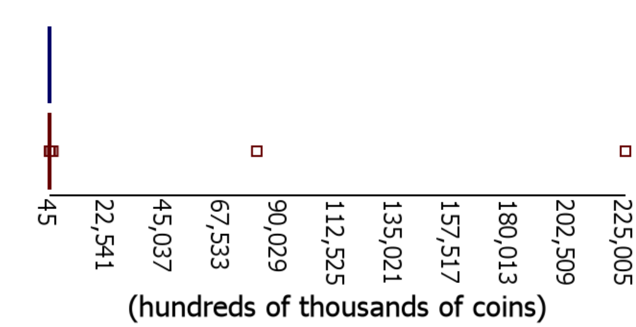


The distribution is centered around 6,042,674 coins (median). It has a low variability (IQR of 546,019 coins) and is mostly symmetrical. There are no large gaps in the distribution. There are 0 outliers on the low end and 69 outliers on the high end, the highest being 22,500,546,590 coins.

Price and cost distributions (outliers omitted)



Price and cost distributions (outliers included)



Key:

Sell Price

Material Cost

5 number summeries (hundreds of thousands of coins):

min: 45, q1: 50, median: 53, q3: 55, max: 60

min: 55, q1: 57, median: 60, q3: 62, max: 70

Statistical test comparing the selling prices and material costs of a superior dragon helmet

Let group1 = Sell prices of a superior dragon helmet, group2 = Material cost of a superior dragon helmet

X_1 = Sell price of a superior dragon helmet (coins), X_2 = Material cost of a superior dragon helmet (coins)

μ_1 = Mean sell price of a superior dragon helmet (coins),

μ_2 = Mean material cost of a superior dragon helmet (coins)

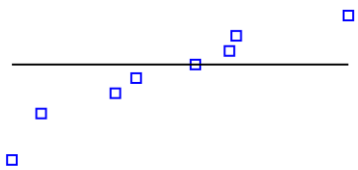
H_o: $\mu_1 = \mu_2$ H_a: $\mu_1 > \mu_2$

Requirements for a difference of means test (σ_1 and σ_2 unknown):

1. 2 independent SRS's: ✓ $n_1 = 8$ $n_2 = 7419$

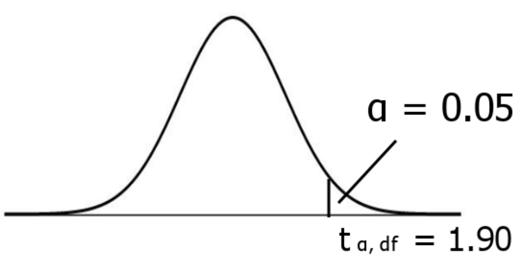
   One price/cost from either group will not affect any price/cost from either group
2. σ is not known, but S_x is: ✓ S_1 = 493,664.3015 coins S_2 = 331,897.6719 coins
3. Group1 is normally distributed and $n_2 > 30$: ✓

Quantile plot of sell prices $n_2 = 7419 > 30$



Rejection Critieria:

$\alpha = 0.05$ df = 7



Reject H_o if $t > 1.90$

Test Statistic:

$$t = \frac{(\bar{x}_1 - \bar{x}_2) - (\mu_1 - \mu_2)}{\sqrt{\frac{S_1^2}{N_1} + \frac{S_2^2}{N_2}}}$$

$t = -4.85$

p-value = 0.9991

Inputs:

$\bar{x}_1$ = 5,179,187.5 (coins)

$\bar{x}_2$ = 6,026,330.3345 (coins)

S_1 = 493,664.3015 (coins)

S_2 = 331,897.6719 (coins)

$n_1 = 8$

n_2 = 7,419

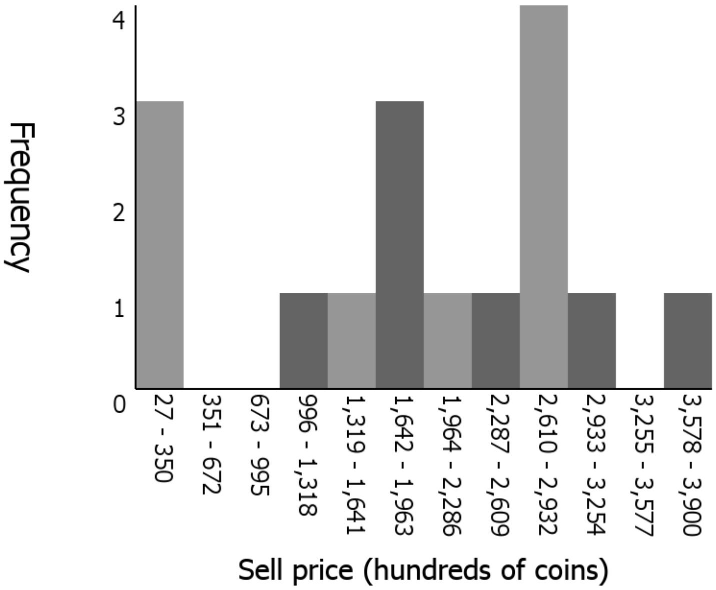
Fail to reject H_o since $-4.85 < 1.90$

There is not significant evidence at the α=0.05 level of significance to support the claim that the mean selling price of a superior dragon helmet is greater than the mean cost of the materials required to make it.

Since we failed to reject H_o, it suggests that on average people did not earn more coins from selling this item than it would have cost them to buy the materials.

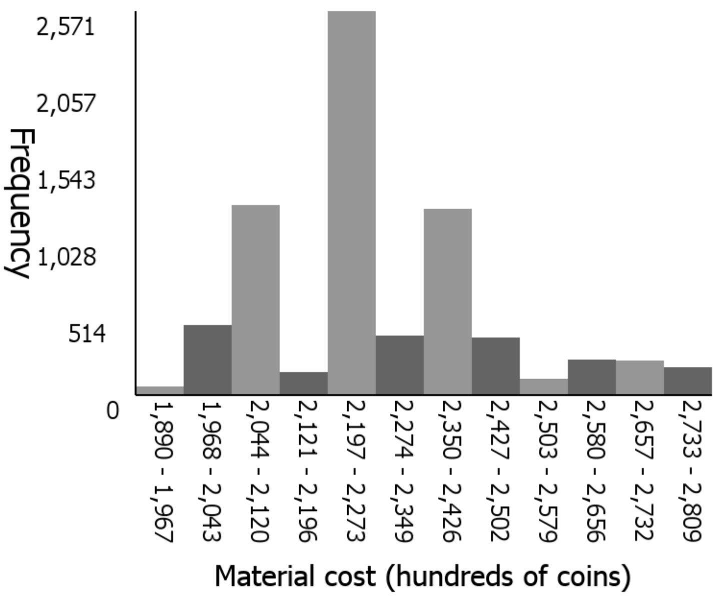
Selling prices and material costs of a mineral talisman

Sell price distribution (outliers omitted)



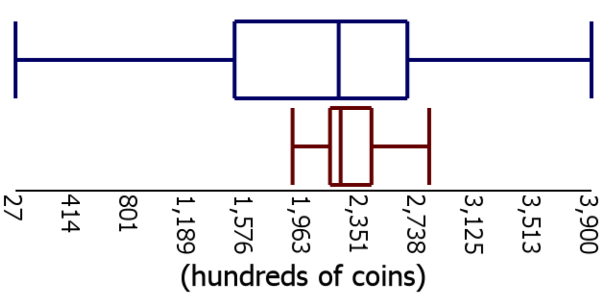
The distribution is centered around 220,000 coins (median). It has a low variability (IQR of 116,200 coins) and is skewed left. There are large gaps between 34,950 - 99,505 coins and 325,446 - 357,723 coins. There are 0 outliers on the low end and 2 outliers on the high end, the highest being 1,260,000 coins.

Material cost distribution (outliers omitted)

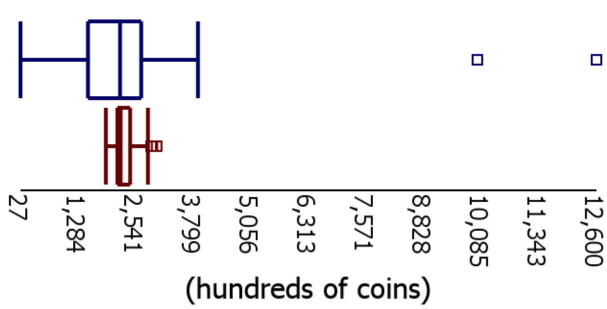


The distribution is centered around 221,317 coins (median). It has a low variability (IQR of 27,846 coins) and is mostly symmetrical. There are no large gaps in the distribution. There are 0 outliers on the low end and 162 outliers on the high end, the highest being 299,996 coins.

Price and cost distributions (outliers omitted)



Price and cost distributions (outliers included)



Key:

Sell Price

Material Cost

5 number summeries (hundreds of coins):

min: 27, q1: 1,500, median: 2,200, q3: 2,662, max: 3,900

min: 1,890, q1: 2,142, median: 2,213, q3: 2,420, max: 2,809

Statistical test comparing the selling prices and material costs of a <u>mineral talisman</u>

Let group1 = Sell prices of a mineral talisman, group2 = Material cost of a mineral talisman

X_1 = Sell price of a mineral talisman (coins), X_2 = Material cost of a mineral talisman (coins)

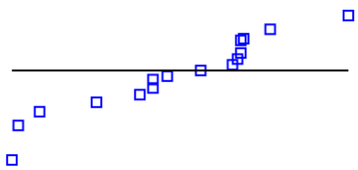
μ_1 = Mean sell price of a mineral talisman (coins), μ_2 = Mean material cost of a mineral talisman (coins)

$H_o: \mu_1 = \mu_2 \quad H_a: \mu_1 > \mu_2$

<u>Requirements for a difference of means test (σ_1 and σ_2 unknown):</u>

1. 2 independent SRS's: ✓ $n_1 = 16$ $n_2 = 7326$
   One price/cost from either group will not affect any price/cost from either group
2. σ is not known, but S_x is: ✓ $S_1 = 110{,}545.8327$ coins $S_2 = 19{,}111.0809$ coins
3. Group1 is normally distributed and $n_2 > 30$: ✓

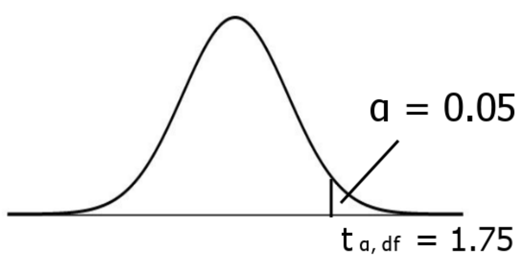
Quantile plot of sell prices



$n_2 = 7326 > 30$

<u>Rejection Critieria:</u>

$\alpha = 0.05$ df = 15



Reject H_o if $t > 1.75$

<u>Test Statistic:</u>

$$t = \frac{(\bar{x}_1 - \bar{x}_2) - (\mu_1 - \mu_2)}{\sqrt{\frac{S_1^2}{N_1} + \frac{S_2^2}{N_2}}}$$

$t = -1.35$

p-value = 0.9015

Inputs:

$\bar{x}_1 = 189{,}973.9375$ (coins)
$\bar{x}_2 = 227{,}291.0011$ (coins)
$S_1 = 110{,}545.8327$ (coins)
$S_2 = 19{,}111.0809$ (coins)
$n_1 = 16$
$n_2 = 7{,}326$

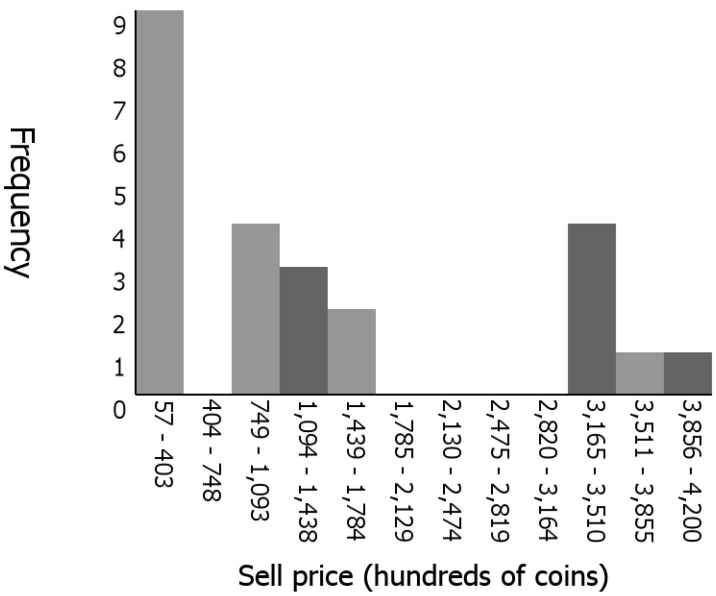
Fail to reject H_o since $-1.35 < 1.75$

There is not significant evidence at the $\alpha=0.05$ level of significance to support the claim that the mean selling price of a mineral talisman is greater than the mean cost of the materials required to make it.

Since we failed to reject H_o, it suggests that on average people did not earn more coins from selling this item than it would have cost them to buy the materials.

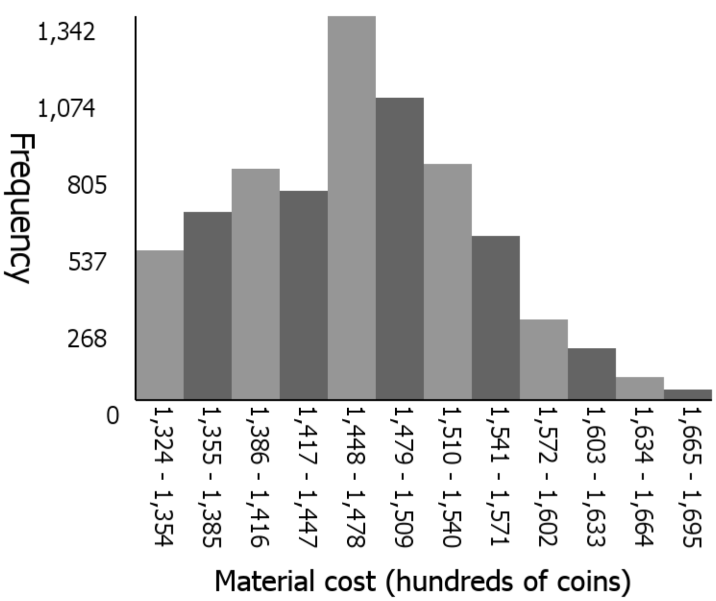
Selling prices and material costs of a spider queens stinger

Sell price distribution (outliers omitted)



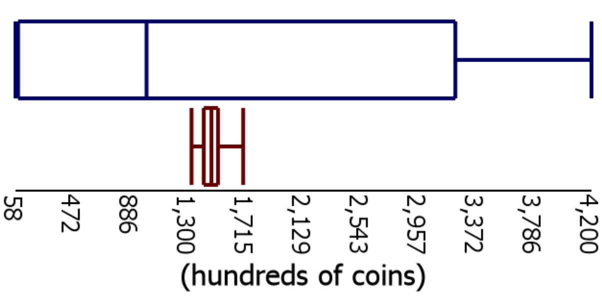
The distribution is centered around 100,000 coins (median). It has a high variability (IQR of 314,497 coins) and is skewed right. There are large gaps between 40,271 - 74,792 coins and 178,354 - 316,438 coins. There are 0 outliers on the low end and 0 outliers on the high end.

Material cost distribution (outliers omitted)

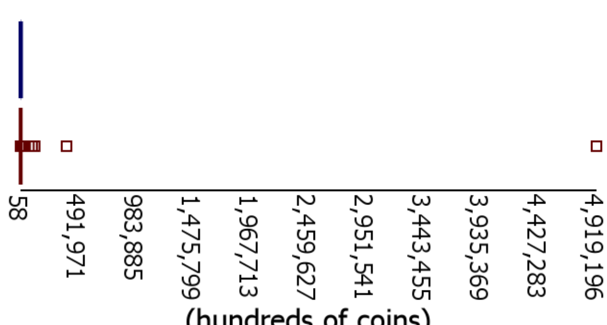


The distribution is centered around 146,669 coins (median). It has a low variability (IQR of 10,250 coins) and is mostly symmetrical. There are no large gaps in the distribution. There are 1 outliers on the low end, the lowest being 55,703 coins and 391 outliers on the high end, the highest being 491,919,644 coins.

Price and cost distributions (outliers omitted)



Price and cost distributions (outliers included)



Key:

Sell Price

Material Cost

5 number summeries (hundreds of coins):

min: 58, q1: 76, median: 1,000, q3: 3,221, max: 4,200

min: 1,324, q1: 1,412, median: 1,467, q3: 1,514, max: 1,695

Statistical test comparing the selling prices and material costs of a spider queens stinger

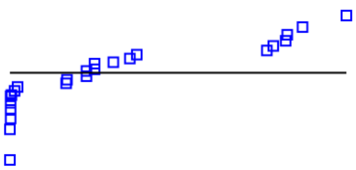
Let group1 = Sell prices of a spider queens stinger, group2 = Material cost of a spider queens stinger
X_1 = Sell price of a spider queens stinger (coins), X_2 = Material cost of a spider queens stinger (coins)
μ_1 = Mean sell price of a spider queens stinger (coins), μ_2 = Mean material cost of a spider queens stinger (coins)

H_o: $\mu_1 = \mu_2$ H_a: $\mu_1 > \mu_2$

Requirements for a difference of means test (σ_1 and σ_2 unknown):

1. 2 independent SRS's: ✓ $n_1 = 24$ $n_2 = 7096$
   One price/cost from either group will not affect any price/cost from either group
2. σ is not known, but S_x is: ✓ S_1 = 140,474.2009 coins S_2 = 7,539.4996 coins
3. Group1 is normally distributed and $n_2 > 30$: ✓

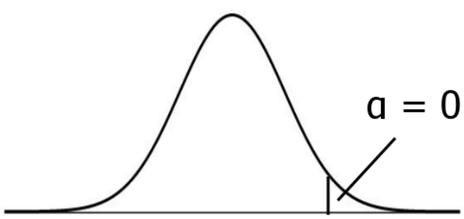
Quantile plot of sell prices



$n_2 = 7096 > 30$

Rejection Critieria:

$\alpha = 0.05$ df = 23



$\alpha = 0.05$

$t_{\alpha,\,df} = 1.72$

Reject H_o if $t > 1.72$

Test Statistic:

$$t = \frac{(\bar{x}_1 - \bar{x}_2) - (\mu_1 - \mu_2)}{\sqrt{\frac{S_1^2}{N_1} + \frac{S_2^2}{N_2}}}$$

Inputs:

$\bar{x}_1$ = 134,263 (coins)
$\bar{x}_2$ = 146,560.4089 (coins)
S_1 = 140,474.2009 (coins)
S_2 = 7,539.4996 (coins)
n_1 = 24
n_2 = 7,096

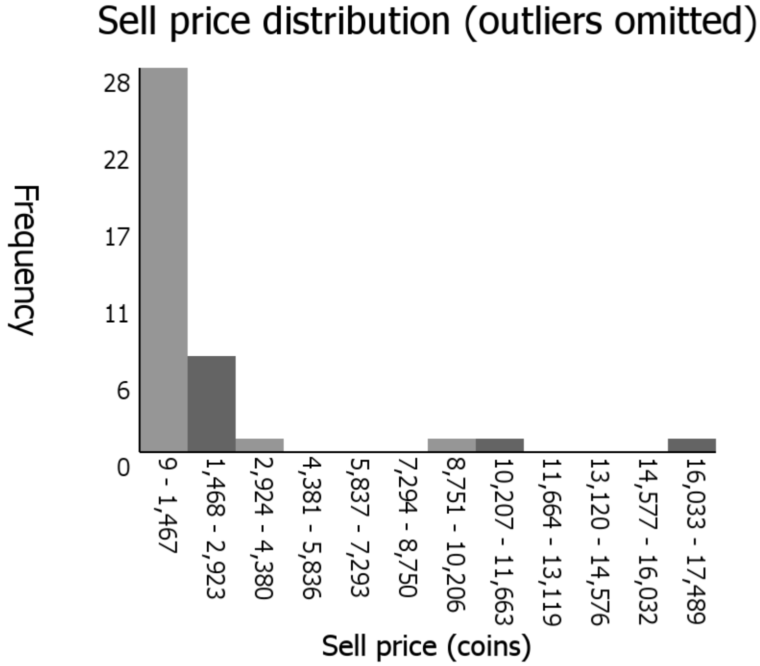
$t = -0.43$
p-value = 0.6640

Fail to reject H_o since $-0.43 < 1.72$

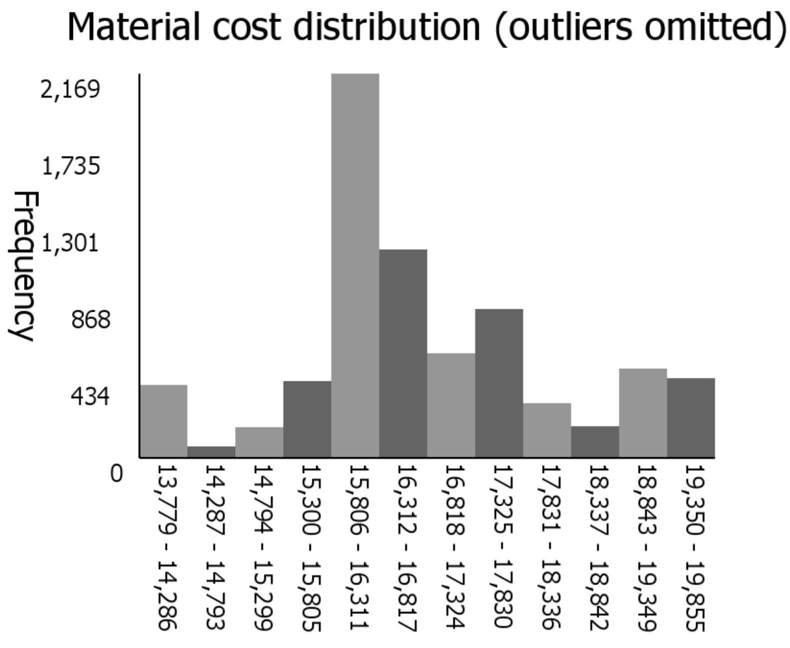
There is not significant evidence at the $\alpha=0.05$ level of significance to support the claim that the mean selling price of a spider queens stinger is greater than the mean cost of the materials required to make it.

Since we failed to reject H_o, it suggests that on average people did not earn more coins from selling this item than it would have cost them to buy the materials.

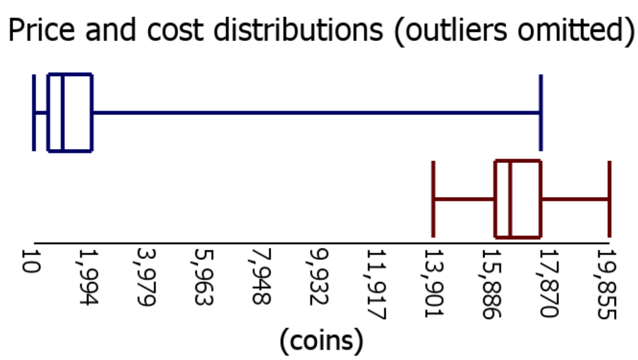
Selling prices and material costs of a repelling candle

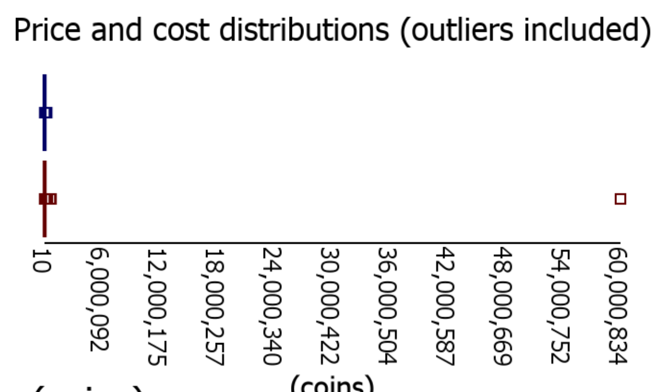


The distribution is centered around 999 coins (median). It has a low variability (IQR of 1,500 coins) and is skewed right. There are large gaps between 4,380 - 8,750 coins and 11,663 - 16,032 coins. There are 0 outliers on the low end and 11 outliers on the high end, the highest being 230,000 coins.



The distribution is centered around 16,431 coins (median). It has a low variability (IQR of 1,563 coins) and is mostly symmetrical. There are no large gaps in the distribution. There are 0 outliers on the low end and 186 outliers on the high end, the highest being 60,000,834 coins.





Key:

Sell Price

Material Cost

5 number summeries (coins):

min: 10, q1: 500, median: 999, q3: 2,000, max: 17,489

min: 13,780, q1: 15,914, median: 16,431, q3: 17,477, max: 19,855

Statistical test comparing the selling prices and material costs of a repelling candle

Let group1 = Sell prices of a repelling candle, group2 = Material cost of a repelling candle
X_1 = Sell price of a repelling candle (coins), X_2 = Material cost of a repelling candle (coins)
μ_1 = Mean sell price of a repelling candle (coins), μ_2 = Mean material cost of a repelling candle (coins)

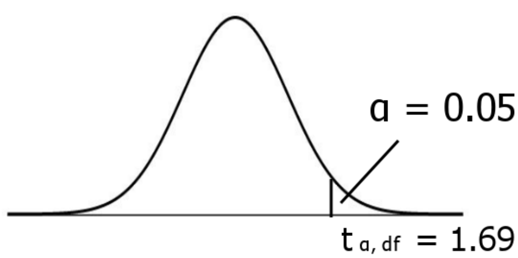
H_o: $\mu_1 = \mu_2$ H_a: $\mu_1 > \mu_2$

Requirements for a difference of means test (σ_1 and σ_2 unknown):

1. 2 independent SRS's: ✓ $n_1 = 39$ $n_2 = 7302$
   One price/cost from either group will not affect any price/cost from either group
2. σ is not known, but S_x is: ✓ $S_1 = 3{,}376.8761$ coins $S_2 = 1{,}364.4512$ coins
3. $n_1 > 30$ and $n_2 > 30$: ✓ $n_1 = 39 > 30$ $n_2 = 7302 > 30$

Rejection Critieria:

$\alpha = 0.05$ df = 38



Reject H_o if $t > 1.69$

Test Statistic:

$$t = \frac{(\bar{x}_1 - \bar{x}_2) - (\mu_1 - \mu_2)}{\sqrt{\frac{S_1^2}{N_1} + \frac{S_2^2}{N_2}}}$$

$t = -27.35$
p-value > 0.9999

Inputs:

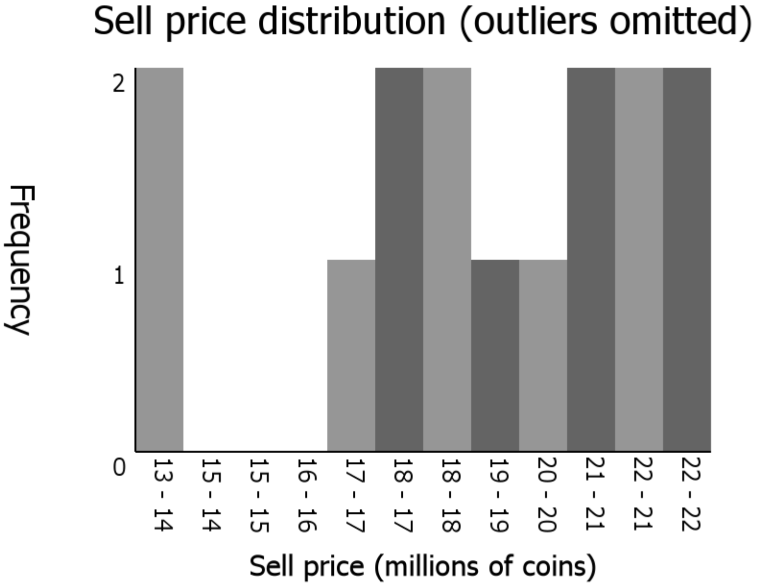
$\bar{x}_1$ = 1,964.9487 (coins)
$\bar{x}_2$ = 16,762.1627 (coins)
S_1 = 3,376.8761 (coins)
S_2 = 1,364.4512 (coins)
n_1 = 39
n_2 = 7,302

Fail to reject H_o since $-27.35 < 1.69$

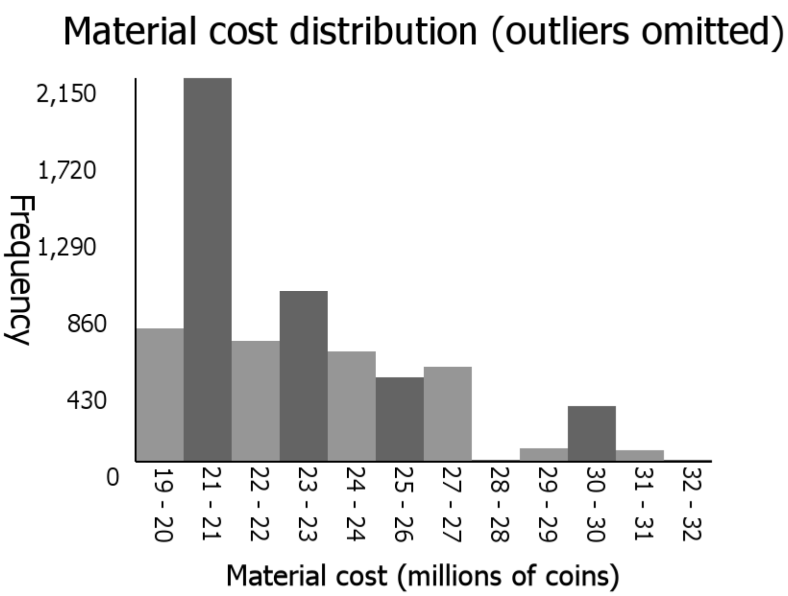
There is not significant evidence at the α=0.05 level of significance to support the claim that the mean selling price of a repelling candle is greater than the mean cost of the materials required to make it.

Since we failed to reject H_o, it suggests that on average people did not earn more coins from selling this item than it would have cost them to buy the materials.

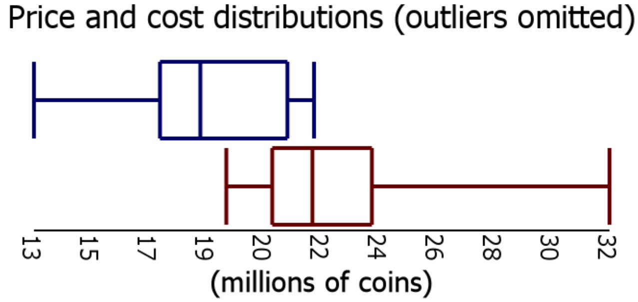
Selling prices and material costs of a pigman sword

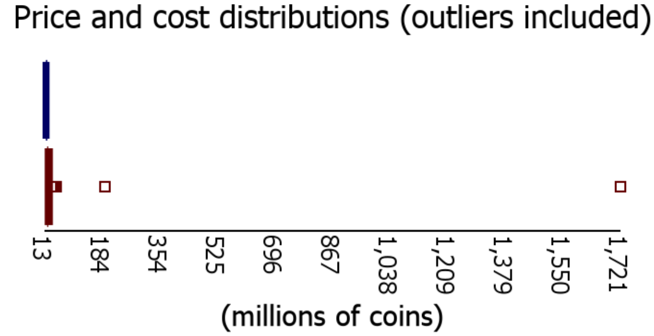


The distribution is centered around 18,307,141 coins (median). It has a low variability (IQR of 4,225,164 coins) and is mostly symmetrical. There is a large gap between 13,564,258 - 15,885,713 coins. There are 0 outliers on the low end and 0 outliers on the high end.



The distribution is centered around 22,023,247 coins (median). It has a low variability (IQR of 3,303,805 coins) and is mostly symmetrical. There are no large gaps in the distribution. There are 0 outliers on the low end and 863 outliers on the high end, the highest being 1,721,020,925 coins.





Key:

Sell Price

Material Cost

5 number summeries (millions of coins):

min: 13, q1: 17, median: 18, q3: 21, max: 22

min: 19, q1: 21, median: 22, q3: 24, max: 32

Statistical test comparing the selling prices and material costs of a pigman sword

Let group1 = Sell prices of a pigman sword, group2 = Material cost of a pigman sword
X_1 = Sell price of a pigman sword (coins), X_2 = Material cost of a pigman sword (coins)
μ_1 = Mean sell price of a pigman sword (coins), μ_2 = Mean material cost of a pigman sword (coins)

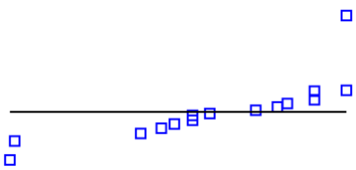
$H_o: \mu_1 = \mu_2$ $\quad H_a: \mu_1 > \mu_2$

Requirements for a difference of means test (σ_1 and σ_2 unknown):

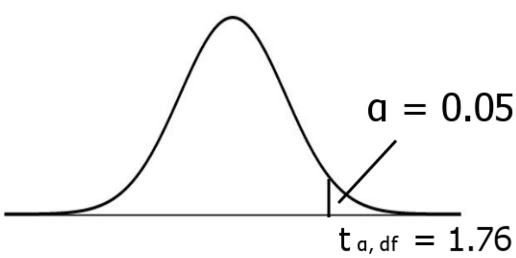
1. 2 independent SRS's: ✓ $n_1 = 15$ $n_2 = 6625$
   One price/cost from either group will not affect any price/cost from either group
2. σ is not known, but S_x is: ✓ S_1 = 2,935,026.5724 coins S_2 = 2,650,335.5103 coins
3. Group1 is normally distributed and $n_2 > 30$: ✓

Quantile plot of sell prices

$n_2 = 6625 > 30$



Rejection Critieria:
$\alpha = 0.05$ df = 14



Reject H_o if $t > 1.76$

Test Statistic:

$$t = \frac{(\bar{x}_1 - \bar{x}_2) - (\mu_1 - \mu_2)}{\sqrt{\frac{S_1^2}{N_1} + \frac{S_2^2}{N_2}}}$$

$t = -5.54$
p-value > 0.9999

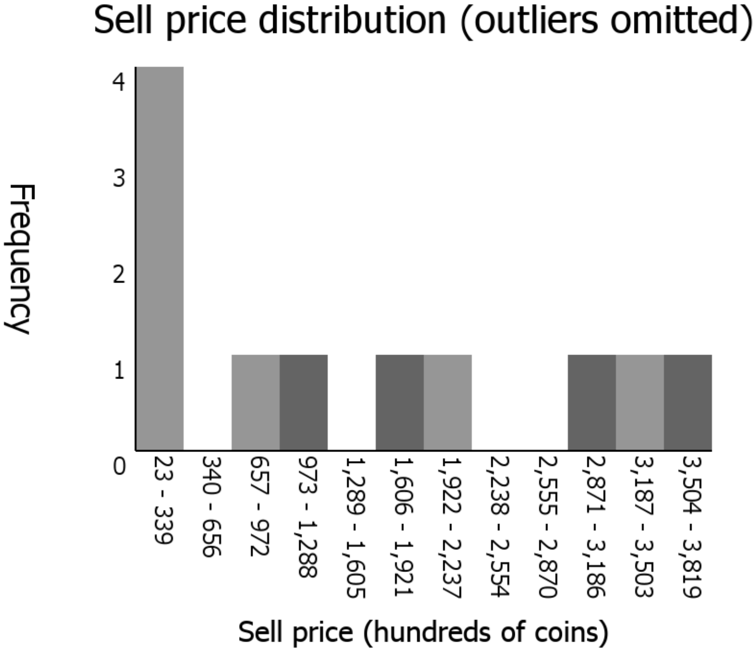
Inputs:
$\bar{x}_1$ = 18,474,518.9333 (coins)
$\bar{x}_2$ = 22,680,508.7652 (coins)
S_1 = 2,935,026.5724 (coins)
S_2 = 2,650,335.5103 (coins)
$n_1 = 15$
n_2 = 6,625

Fail to reject H_o since $-5.54 < 1.76$

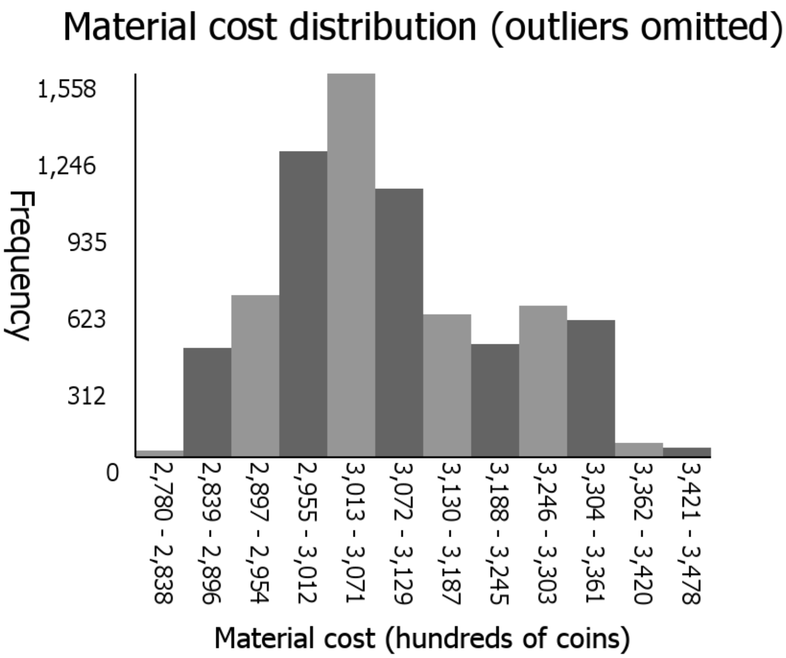
There is not significant evidence at the α=0.05 level of significance to support the claim that the mean selling price of a pigman sword is greater than the mean cost of the materials required to make it.

Since we failed to reject H_o, it suggests that on average people did not earn more coins from selling this item than it would have cost them to buy the materials.

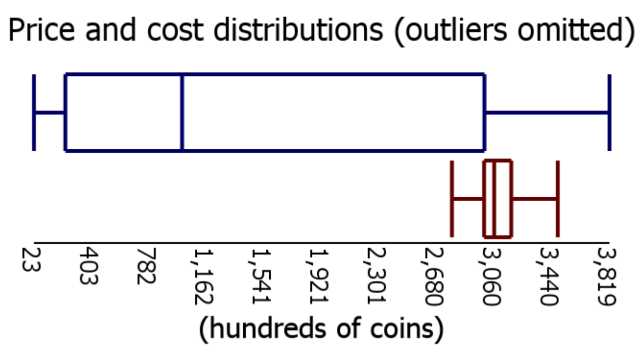
Selling prices and material costs of a crystal boots

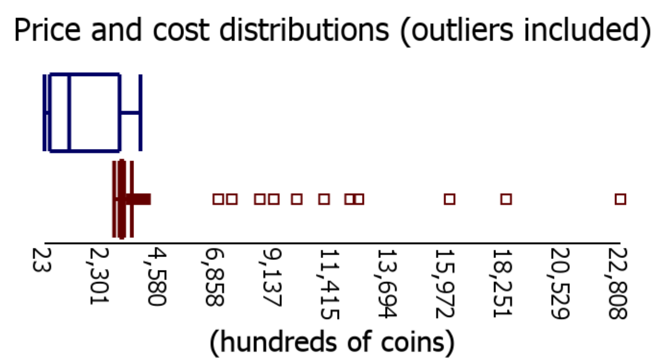


The distribution is centered around 100,000 coins (median). It has a moderate variability (IQR of 276,411 coins) and is skewed right. There are large gaps between 33,934 - 65,569 coins, 128,838 - 160,472 coins, and 223,741 - 287,010 coins. There are 0 outliers on the low end and 0 outliers on the high end.



The distribution is centered around 305,849 coins (median). It has a low variability (IQR of 17,901 coins) and is mostly symmetrical. There are no large gaps in the distribution. There are 0 outliers on the low end and 153 outliers on the high end, the highest being 2,280,793 coins.





Key:

Sell Price

Material Cost

5 number summeries (hundreds of coins):

min: 23, q1: 230, median: 1,000, q3: 2,994, max: 3,819

min: 2,780, q1: 2,992, median: 3,058, q3: 3,171, max: 3,478

Statistical test comparing the selling prices and material costs of a crystal boots

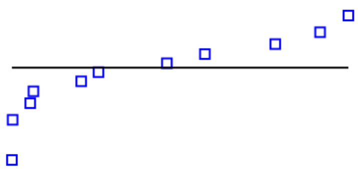
Let group1 = Sell prices of a crystal boots, group2 = Material cost of a crystal boots
X_1 = Sell price of a crystal boots (coins), X_2 = Material cost of a crystal boots (coins)
μ_1 = Mean sell price of a crystal boots (coins), μ_2 = Mean material cost of a crystal boots (coins)

H_o: $\mu_1 = \mu_2$ H_a: $\mu_1 > \mu_2$

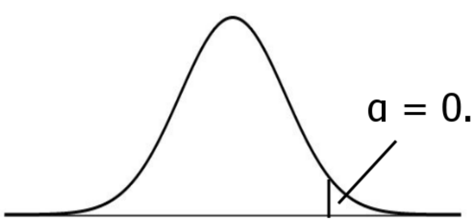
Requirements for a difference of means test (σ_1 and σ_2 unknown):

1. 2 independent SRS's: ✓ $n_1 = 11$ $n_2 = 7335$
   One price/cost from either group will not affect any price/cost from either group
2. σ is not known, but S_x is: ✓ $S_1 = 142{,}764.3956$ coins $S_2 = 13{,}612.2757$ coins
3. Group1 is normally distributed and $n_2 > 30$: ✓

Quantile plot of sell prices $n_2 = 7335 > 30$



Rejection Critieria:
$\alpha = 0.05$ df = 10



Reject H_o if $t > 1.81$

Test Statistic:

$$t = \frac{(\bar{x}_1 - \bar{x}_2) - (\mu_1 - \mu_2)}{\sqrt{\frac{S_1^2}{N_1} + \frac{S_2^2}{N_2}}}$$

$t = -3.66$
p-value = 0.9978

Inputs:
$\bar{x}_1 = 151{,}268.4545$ (coins)
$\bar{x}_2 = 308{,}614.6285$ (coins)
$S_1 = 142{,}764.3956$ (coins)
$S_2 = 13{,}612.2757$ (coins)
$n_1 = 11$
$n_2 = 7{,}335$

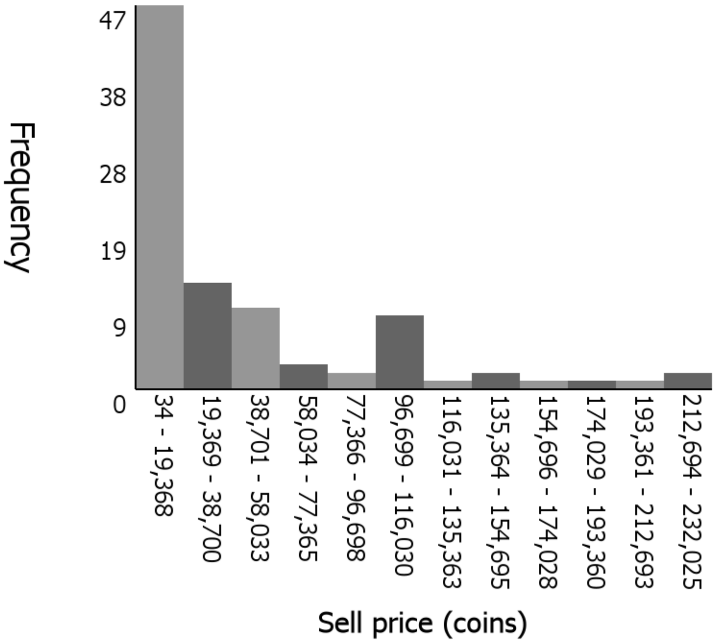
Fail to reject H_o since $-3.66 < 1.81$

There is not significant evidence at the α=0.05 level of significance to support the claim that the mean selling price of a crystal boots is greater than the mean cost of the materials required to make it.

Since we failed to reject H_o, it suggests that on average people did not earn more coins from selling this item than it would have cost them to buy the materials.

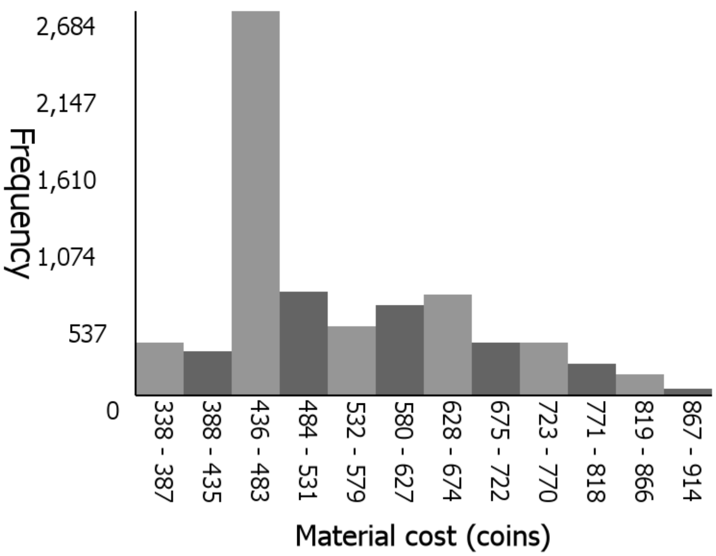
Selling prices and material costs of a night saver

Sell price distribution (outliers omitted)



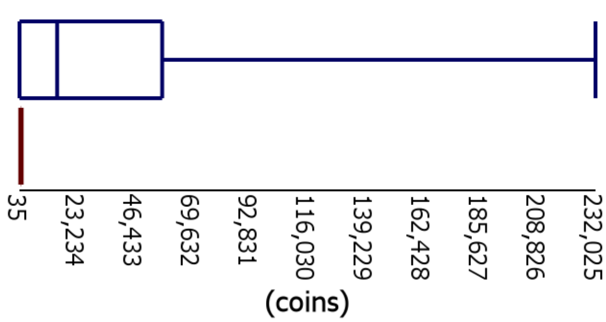
The distribution is centered around 15,209 coins (median). It has a high variability (IQR of 57,439 coins) and is skewed right. There are no large gaps in the distribution. There are 0 outliers on the low end and 16 outliers on the high end, the highest being 2,000,000 coins.

Material cost distribution (outliers omitted)

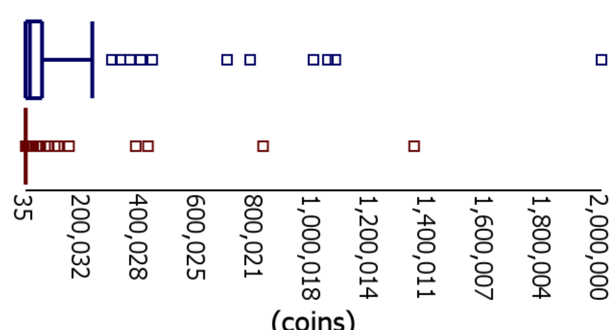


The distribution is centered around 488 coins (median). It has a low variability (IQR of 158 coins) and is skewed right. There are no large gaps in the distribution. There are 0 outliers on the low end and 421 outliers on the high end, the highest being 1,349,436 coins.

Price and cost distributions (outliers omitted)



Price and cost distributions (outliers included)



Key:

Sell Price

Material Cost

5 number summeries (coins):

min: 35, q1: 61, median: 15,209, q3: 57,500, max: 232,025

min: 339, q1: 469, median: 488, q3: 628, max: 914

Statistical test comparing the selling prices and material costs of a night saver

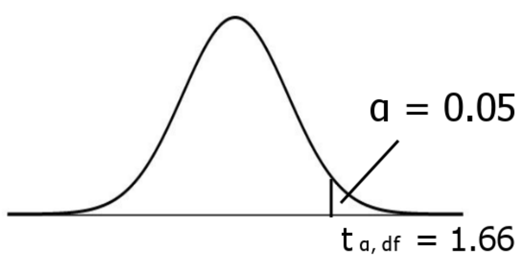
Let group1 = Sell prices of a night saver, group2 = Material cost of a night saver
X_1 = Sell price of a night saver (coins), X_2 = Material cost of a night saver (coins)
μ_1 = Mean sell price of a night saver (coins), μ_2 = Mean material cost of a night saver (coins)

H_o: $\mu_1 = \mu_2$ $\quad$ H_a: $\mu_1 > \mu_2$

Requirements for a difference of means test (σ_1 and σ_2 unknown):

1. 2 independent SRS's: ✓ $n_1 = 92$ $n_2 = 7067$
   One price/cost from either group will not affect any price/cost from either group
2. σ is not known, but S_x is: ✓ $S_1 = 55{,}383.661$ coins $S_2 = 118.6294$ coins
3. $n_1 > 30$ and $n_2 > 30$: ✓ $n_1 = 92 > 30$ $n_2 = 7067 > 30$

Rejection Critieria:
$\alpha = 0.05$ df = 91



Reject H_o if $t > 1.66$

Test Statistic:

$$t = \frac{(\bar{x}_1 - \bar{x}_2) - (\mu_1 - \mu_2)}{\sqrt{\frac{S_1^2}{N_1} + \frac{S_2^2}{N_2}}}$$

$t = 6.96$
p-value < 0.0001

Reject H_o since $6.96 > 1.66$

Inputs:
$\bar{x}_1 = 40{,}725.3913$ (coins)
$\bar{x}_2 = 547.2291$ (coins)
$S_1 = 55{,}383.661$ (coins)
$S_2 = 118.6294$ (coins)
$n_1 = 92$
$n_2 = 7{,}067$

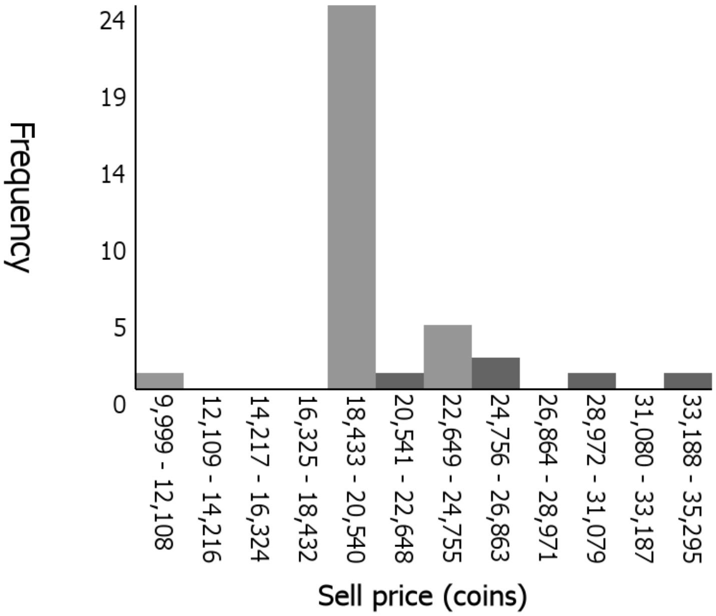
There is significant evidence at the α=0.05 level of significance to support the claim that the mean selling price of a night saver is greater than the mean cost of the materials required to make it.

Since we rejected H_o, it suggests that on average people earned more coins from selling this item than it would have cost them to buy the materials.

Implication: the test suggests that on average we could make a profit from flipping this item.

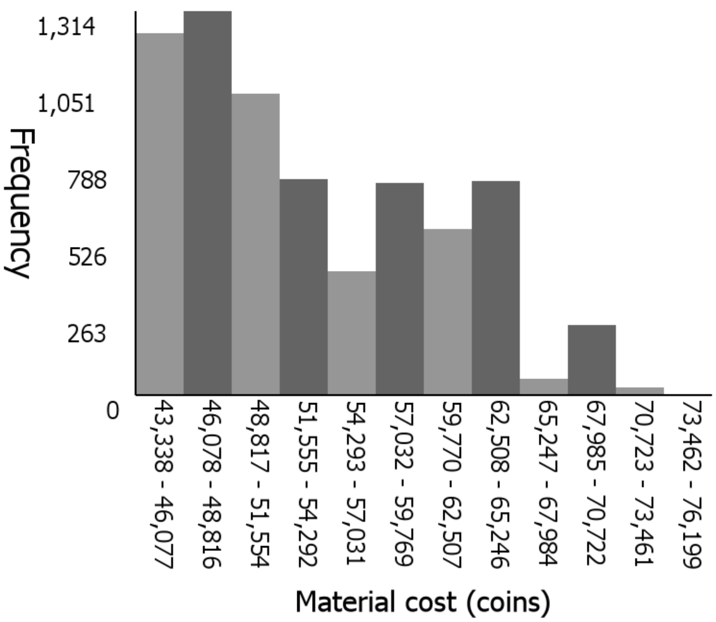
Selling prices and material costs of a glowstone gauntlet

Sell price distribution (outliers omitted)



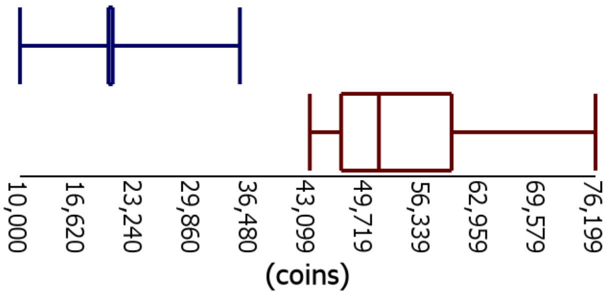
The distribution is centered around 20,180 coins (median). It has a low variability (IQR of 484 coins) and is skewed right. There are large gaps between 12,108 - 18,432 coins, 26,863 - 28,971 coins, and 31,079 - 33,187 coins. There are 7 outliers on the low end, the lowest being 18 coins and 9 outliers on the high end, the highest being 726,000 coins.

Material cost distribution (outliers omitted)

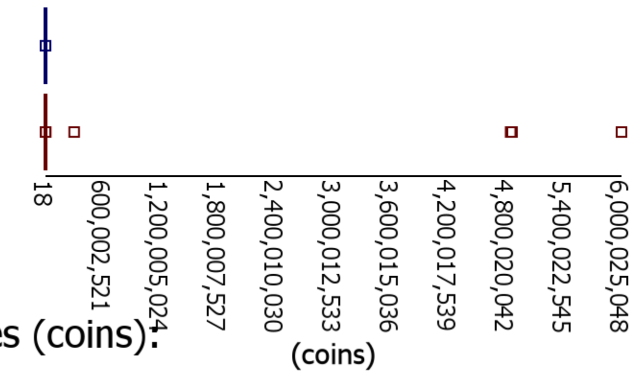


The distribution is centered around 51,283 coins (median). It has a low variability (IQR of 12,706 coins) and is mostly symmetrical. There are no large gaps in the distribution. There are 0 outliers on the low end and 390 outliers on the high end, the highest being 6,000,025,048 coins.

Price and cost distributions (outliers omitted)



Price and cost distributions (outliers included)



Key:

Sell Price

Material Cost

5 number summeries (coins):

min: 10,000, q1: 20,180, median: 20,180, q3: 20,664, max: 35,295

min: 43,339, q1: 46,940, median: 51,283, q3: 59,646, max: 76,199

Statistical test comparing the selling prices and material costs of a glowstone gauntlet

Let group1 = Sell prices of a glowstone gauntlet, group2 = Material cost of a glowstone gauntlet
X_1 = Sell price of a glowstone gauntlet (coins), X_2 = Material cost of a glowstone gauntlet (coins)
μ_1 = Mean sell price of a glowstone gauntlet (coins), μ_2 = Mean material cost of a glowstone gauntlet (coins)

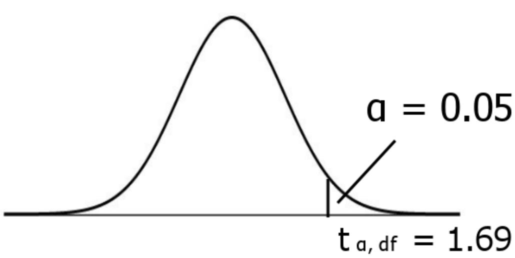
$H_o: \mu_1 = \mu_2 \quad H_a: \mu_1 > \mu_2$

Requirements for a difference of means test (σ_1 and σ_2 unknown):

1. 2 independent SRS's: ✓ $n_1 = 34$ $n_2 = 7098$
   One price/cost from either group will not affect any price/cost from either group
2. σ is not known, but S_x is: ✓ $S_1 = 3{,}957.7702$ coins $S_2 = 7{,}149.629$ coins
3. $n_1 > 30$ and $n_2 > 30$: ✓ $n_1 = 34 > 30$ $n_2 = 7098 > 30$

Rejection Critieria:

$\alpha = 0.05$ df = 33



Reject H_o if $t > 1.69$

Test Statistic:

$$t = \frac{(\bar{x}_1 - \bar{x}_2) - (\mu_1 - \mu_2)}{\sqrt{\frac{S_1^2}{N_1} + \frac{S_2^2}{N_2}}}$$

Inputs:

$\bar{x}_1 = 21{,}361$ (coins)
$\bar{x}_2 = 53{,}285.6377$ (coins)
$S_1 = 3{,}957.7702$ (coins)
$S_2 = 7{,}149.629$ (coins)
$n_1 = 34$
$n_2 = 7{,}098$

$t = -46.67$
p-value > 0.9999

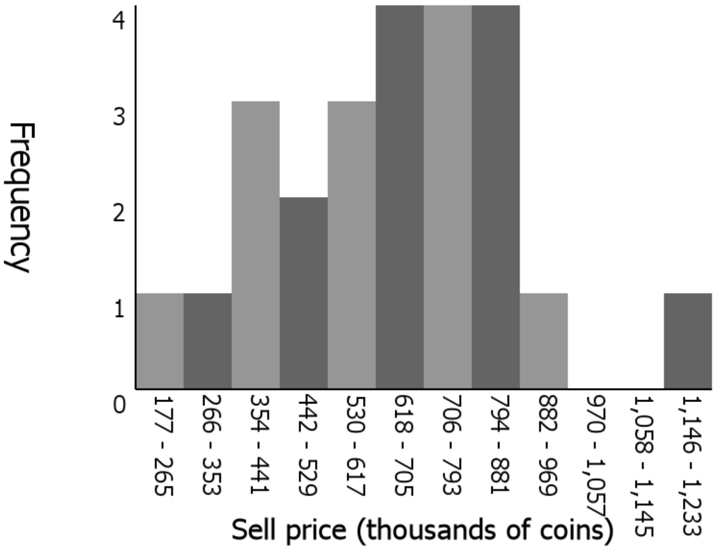
Fail to reject H_o since $-46.67 < 1.69$

There is not significant evidence at the $\alpha=0.05$ level of significance to support the claim that the mean selling price of a glowstone gauntlet is greater than the mean cost of the materials required to make it.

Since we failed to reject H_o, it suggests that on average people did not earn more coins from selling this item than it would have cost them to buy the materials.

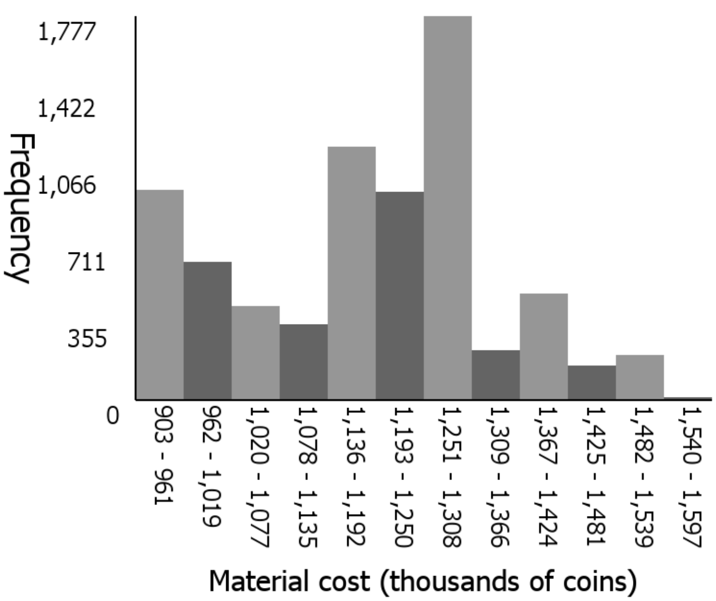
Selling prices and material costs of a strong dragon chestplate

Sell price distribution (outliers omitted)



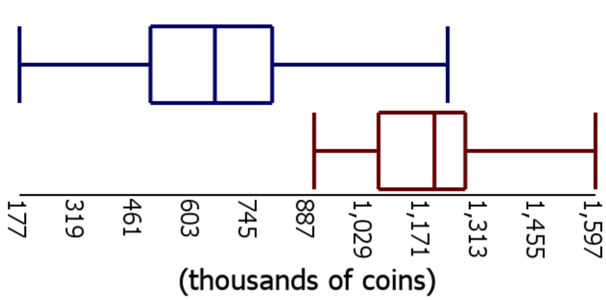
The distribution is centered around 658,845 coins (median). It has a low variability (IQR of 300,000 coins) and is mostly symmetrical. There is a large gap between 968,768 - 1,144,682 coins. There are 0 outliers on the low end and 1 outliers on the high end, the highest being 20,000,000 coins.

Material cost distribution (outliers omitted)

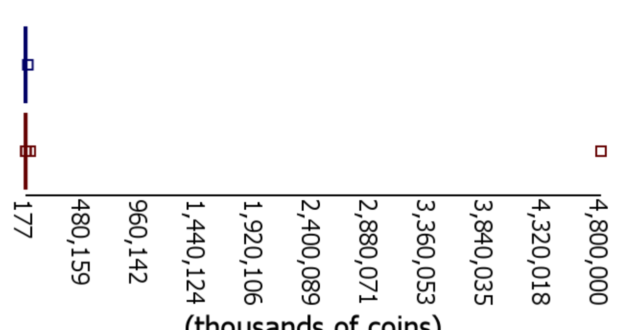


The distribution is centered around 1,200,000 coins (median). It has a low variability (IQR of 213,923 coins) and is mostly symmetrical. There are no large gaps in the distribution. There are 0 outliers on the low end and 70 outliers on the high end, the highest being 4,799,999,991 coins.

Price and cost distributions (outliers omitted)



Price and cost distributions (outliers included)



Key:

Sell Price

Material Cost

5 number summeries (thousands of coins):

min: 177, q1: 500, median: 659, q3: 800, max: 1,233

min: 903, q1: 1,062, median: 1,200, q3: 1,276, max: 1,597

Statistical test comparing the selling prices and material costs of a <u>strong dragon chestplate</u>

Let group1 = Sell prices of a strong dragon chestplate, group2 = Material cost of a strong dragon chestplate

X_1 = Sell price of a strong dragon chestplate (coins), X_2 = Material cost of a strong dragon chestplate (coins)

μ_1 = Mean sell price of a strong dragon chestplate (coins),

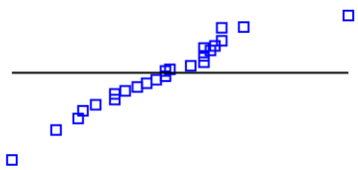
μ_2 = Mean material cost of a strong dragon chestplate (coins)

H_o: $\mu_1 = \mu_2$ H_a: $\mu_1 > \mu_2$

<u>Requirements for a difference of means test (σ_1 and σ_2 unknown):</u>

1. 2 independent SRS's: ✓ $n_1 = 24$ $n_2 = 7418$
   One price/cost from either group will not affect any price/cost from either group
2. σ is not known, but S_x is: ✓ S_1 = 224,692.1919 coins S_2 = 151,919.1649 coins
3. Group1 is normally distributed and $n_2 > 30$: ✓

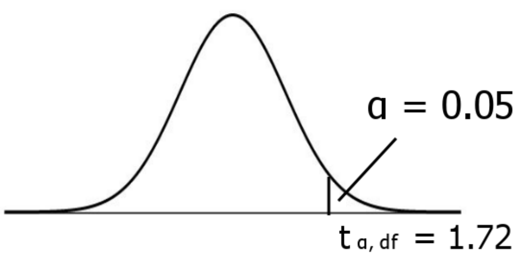
Quantile plot of sell prices



$n_2 = 7418 > 30$

<u>Rejection Critieria:</u>

$\alpha = 0.05$ df = 23



Reject H_o if $t > 1.72$

<u>Test Statistic:</u>

$$t = \frac{(\bar{x}_1 - \bar{x}_2) - (\mu_1 - \mu_2)}{\sqrt{\frac{S_1^2}{N_1} + \frac{S_2^2}{N_2}}}$$

$t = -11.70$

p-value > 0.9999

Inputs:

$\bar{x}_1$ = 647,490 (coins)

$\bar{x}_2$ = 1,184,375.8019 (coins)

S_1 = 224,692.1919 (coins)

S_2 = 151,919.1649 (coins)

$n_1 = 24$

n_2 = 7,418

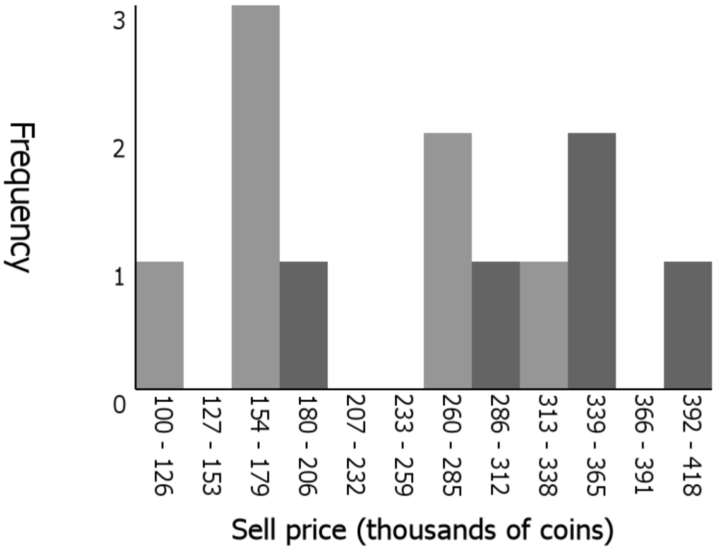
Fail to reject H_o since $-11.70 < 1.72$

There is not significant evidence at the $\alpha=0.05$ level of significance to support the claim that the mean selling price of a strong dragon chestplate is greater than the mean cost of the materials required to make it.

Since we failed to reject H_o, it suggests that on average people did not earn more coins from selling this item than it would have cost them to buy the materials.

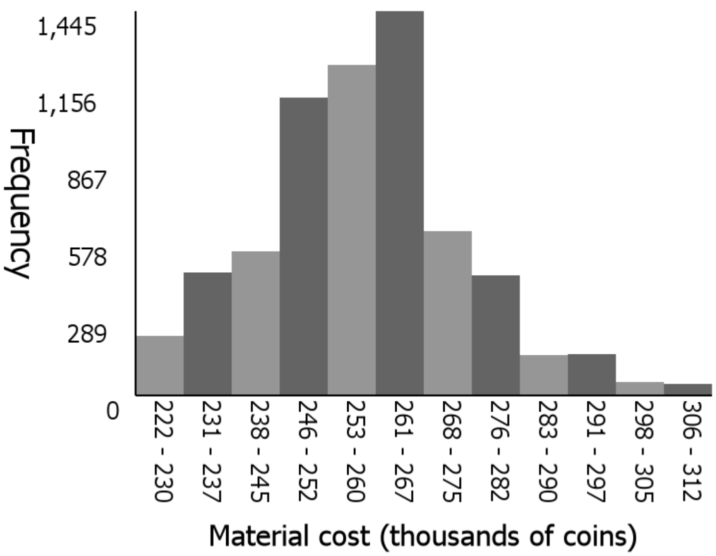
Selling prices and material costs of a protector dragon boots

Sell price distribution (outliers omitted)



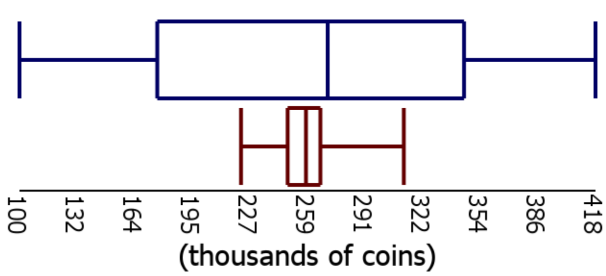
The distribution is centered around 270,000 coins (median). It has a low variability (IQR of 169,228 coins) and is mostly symmetrical. There are large gaps between 126,477 - 152,954 coins, 205,909 - 258,863 coins, and 364,772 - 391,249 coins. There are 0 outliers on the low end and 0 outliers on the high end.

Material cost distribution (outliers omitted)

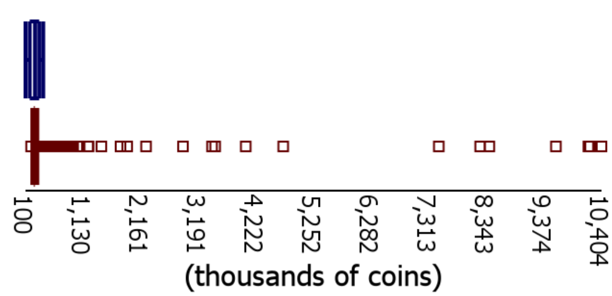


The distribution is centered around 258,025 coins (median). It has a low variability (IQR of 18,065 coins) and is mostly symmetrical. There are no large gaps in the distribution. There are 8 outliers on the low end, the lowest being 199,884 coins and 975 outliers on the high end, the highest being 10,403,964 coins.

Price and cost distributions (outliers omitted)



Price and cost distributions (outliers included)



Key:

Sell Price

Material Cost

5 number summeries (thousands of coins):

min: 100, q1: 176, median: 270, q3: 345, max: 418

min: 222, q1: 248, median: 258, q3: 266, max: 312

Statistical test comparing the selling prices and material costs of a protector dragon boots

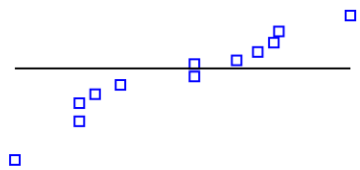
Let group1 = Sell prices of a protector dragon boots, group2 = Material cost of a protector dragon boots
X_1 = Sell price of a protector dragon boots (coins), X_2 = Material cost of a protector dragon boots (coins)
μ_1 = Mean sell price of a protector dragon boots (coins),
μ_2 = Mean material cost of a protector dragon boots (coins)

H_o: $\mu_1 = \mu_2$ H_a: $\mu_1 > \mu_2$

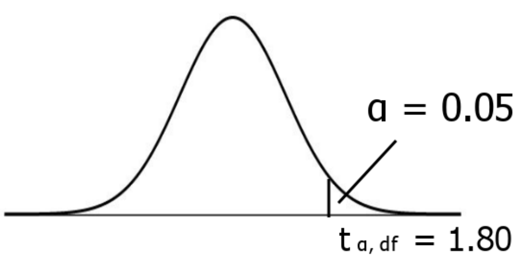
Requirements for a difference of means test (σ_1 and σ_2 unknown):

1. 2 independent SRS's: ✓ $n_1 = 12$ $n_2 = 6505$
   One price/cost from either group will not affect any price/cost from either group
2. σ is not known, but S_x is: ✓ S_1 = 97,051.6729 coins S_2 = 15,713.8938 coins
3. Group1 is normally distributed and $n_2 > 30$: ✓

Quantile plot of sell prices $n_2 = 6505 > 30$



Rejection Critieria:
$\alpha = 0.05$ df = 11



Reject H_o if $t > 1.80$

Test Statistic:

$$t = \frac{(\bar{x}_1 - \bar{x}_2) - (\mu_1 - \mu_2)}{\sqrt{\frac{S_1^2}{N_1} + \frac{S_2^2}{N_2}}}$$

t = -0.01
p-value = 0.5041

Inputs:
$\bar{x}_1$ = 257,588 (coins)
$\bar{x}_2$ = 257,882.4677 (coins)
S_1 = 97,051.6729 (coins)
S_2 = 15,713.8938 (coins)
n_1 = 12
n_2 = 6,505

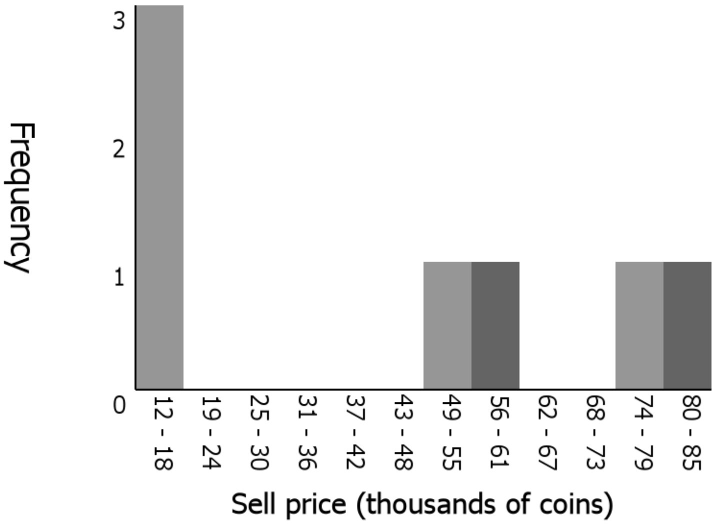
Fail to reject H_o since $-0.01 < 1.80$

There is not significant evidence at the α=0.05 level of significance to support the claim that the mean selling price of a protector dragon boots is greater than the mean cost of the materials required to make it.

Since we failed to reject H_o, it suggests that on average people did not earn more coins from selling this item than it would have cost them to buy the materials.

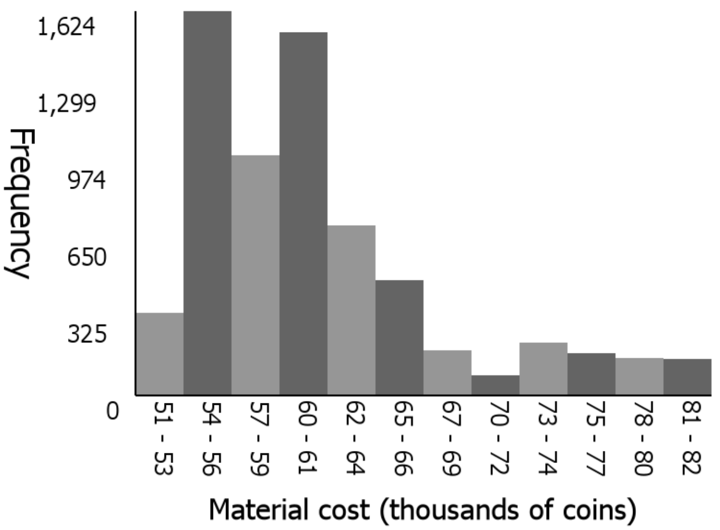
Selling prices and material costs of a golem armor helmet

Sell price distribution (outliers omitted)



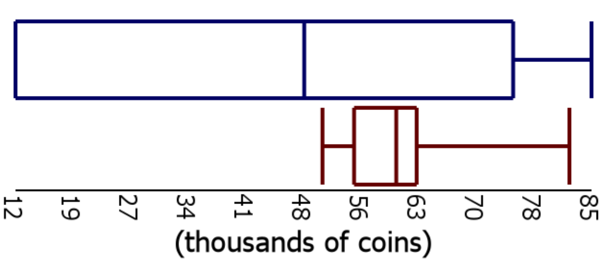
The distribution is centered around 48,550 coins (median). It has a low variability (IQR of 63,000 coins) and is skewed left. There are large gaps between 18,076 - 48,458 coins and 60,610 - 72,763 coins. There are 0 outliers on the low end and 0 outliers on the high end.

Material cost distribution (outliers omitted)

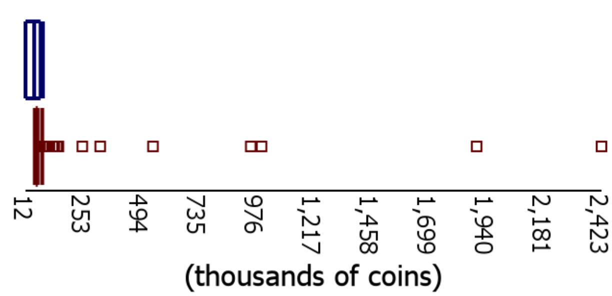


The distribution is centered around 60,200 coins (median). It has a low variability (IQR of 7,921 coins) and is mostly symmetrical. There are no large gaps in the distribution. There are 0 outliers on the low end and 771 outliers on the high end, the highest being 2,422,539 coins.

Price and cost distributions (outliers omitted)



Price and cost distributions (outliers included)



Key:

Sell Price

Material Cost

5 number summeries (thousands of coins):

min: 12, q1: 12, median: 49, q3: 75, max: 85

min: 51, q1: 55, median: 60, q3: 63, max: 82

Statistical test comparing the selling prices and material costs of a golem armor helmet

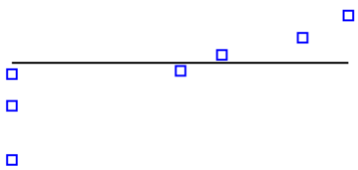
Let group1 = Sell prices of a golem armor helmet, group2 = Material cost of a golem armor helmet
X_1 = Sell price of a golem armor helmet (coins), X_2 = Material cost of a golem armor helmet (coins)
μ_1 = Mean sell price of a golem armor helmet (coins), μ_2 = Mean material cost of a golem armor helmet (coins)

H_o: $\mu_1 = \mu_2$ H_a: $\mu_1 > \mu_2$

Requirements for a difference of means test (σ_1 and σ_2 unknown):

1. 2 independent SRS's: ✓ $n_1 = 7$ $n_2 = 6717$
   One price/cost from either group will not affect any price/cost from either group
2. σ is not known, but S_x is: ✓ S_1 = 31,370.8641 coins S_2 = 6,809.709 coins
3. Group1 is normally distributed and $n_2 > 30$: ✓

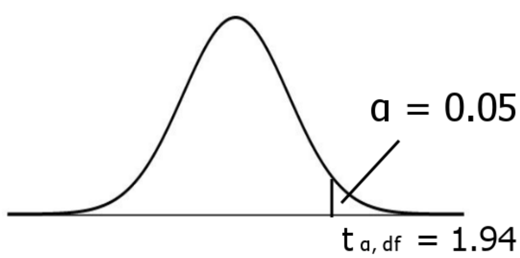
Quantile plot of sell prices



$n_2 = 6717 > 30$

Rejection Critieria:

$\alpha = 0.05$ df = 6



Reject H_o if t > 1.94

Test Statistic:

$$t = \frac{(\bar{x}_1 - \bar{x}_2) - (\mu_1 - \mu_2)}{\sqrt{\frac{S_1^2}{N_1} + \frac{S_2^2}{N_2}}}$$

t = -1.48
p-value = 0.9058

Inputs:

$\bar{x}_1$ = 43,137.8571 (coins)
$\bar{x}_2$ = 60,729.1346 (coins)
S_1 = 31,370.8641 (coins)
S_2 = 6,809.709 (coins)
n_1 = 7
n_2 = 6,717

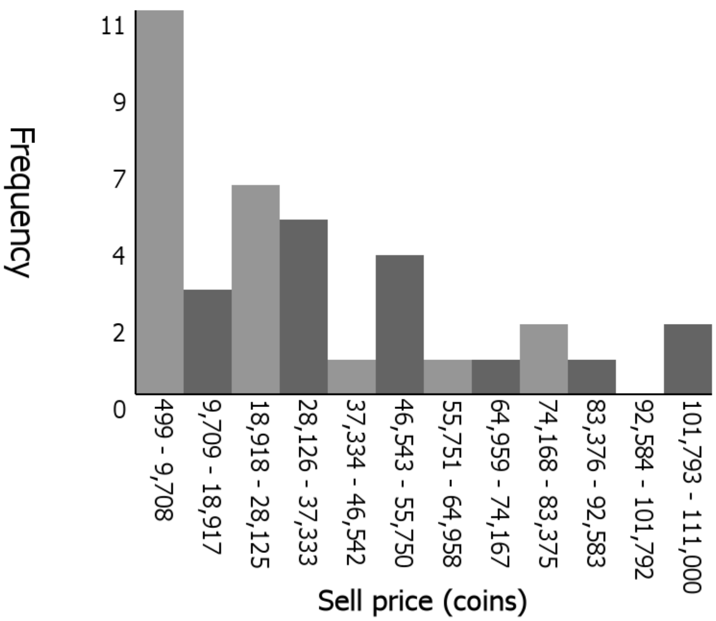
Fail to reject H_o since -1.48 < 1.94

There is not significant evidence at the α=0.05 level of significance to support the claim that the mean selling price of a golem armor helmet is greater than the mean cost of the materials required to make it.

Since we failed to reject H_o, it suggests that on average people did not earn more coins from selling this item than it would have cost them to buy the materials.

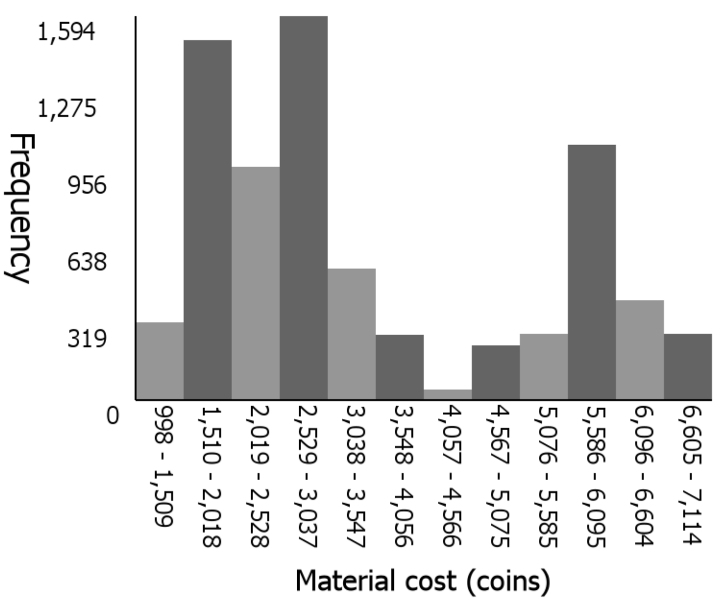
Selling prices and material costs of a voidwalker katana

Sell price distribution (outliers omitted)



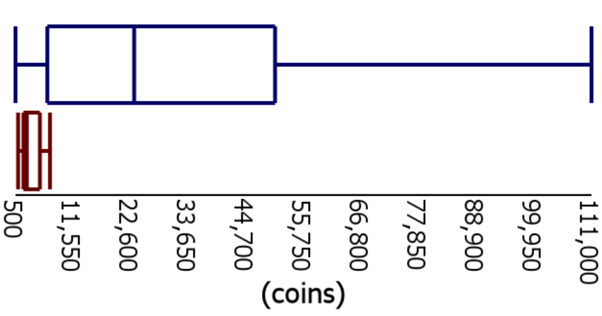
The distribution is centered around 23,266 coins (median). It has a low variability (IQR of 43,686 coins) and is skewed right. There is a large gap between 92,583 - 101,792 coins. There are 0 outliers on the low end and 1 outliers on the high end, the highest being 130,000 coins.

Material cost distribution (outliers omitted)

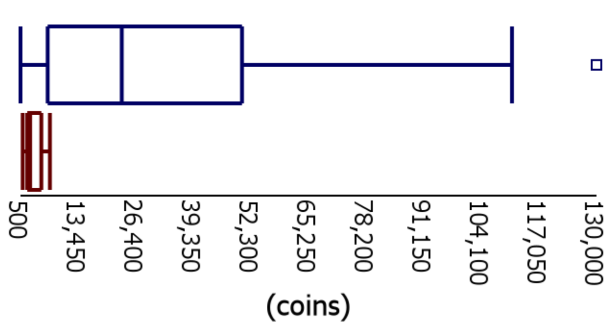


The distribution is centered around 2,673 coins (median). It has a low variability (IQR of 3,152 coins) and is skewed right. There are no large gaps in the distribution. There are 0 outliers on the low end and 0 outliers on the high end.

Price and cost distributions (outliers omitted)



Price and cost distributions (outliers included)



Key:

Sell Price

Material Cost

5 number summeries (coins):

min: 500, q1: 6,613, median: 23,266, q3: 50,299, max: 111,000

min: 999, q1: 2,031, median: 2,673, q3: 5,183, max: 7,114

Statistical test comparing the selling prices and material costs of a voidwalker katana

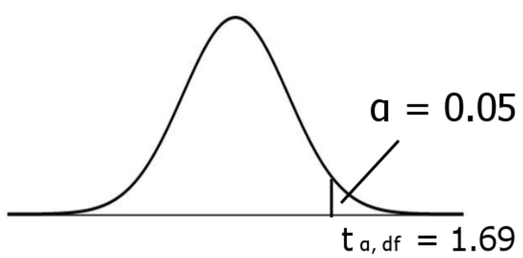
Let group1 = Sell prices of a voidwalker katana, group2 = Material cost of a voidwalker katana
X_1 = Sell price of a voidwalker katana (coins), X_2 = Material cost of a voidwalker katana (coins)
μ_1 = Mean sell price of a voidwalker katana (coins), μ_2 = Mean material cost of a voidwalker katana (coins)

H_o: $\mu_1 = \mu_2$ H_a: $\mu_1 > \mu_2$

Requirements for a difference of means test (σ_1 and σ_2 unknown):

1. 2 independent SRS's: ✓ $n_1 = 37$ $n_2 = 7488$
   One price/cost from either group will not affect any price/cost from either group
2. σ is not known, but S_x is: ✓ S_1 = 31,044.1968 coins S_2 = 1,735.5877 coins
3. $n_1 > 30$ and $n_2 > 30$: ✓ $n_1 = 37 > 30$ $n_2 = 7488 > 30$

Rejection Critieria:
$\alpha = 0.05$ df = 36



Reject H_o if $t > 1.69$

Test Statistic:

$$t = \frac{(\bar{x}_1 - \bar{x}_2) - (\mu_1 - \mu_2)}{\sqrt{\frac{S_1^2}{N_1} + \frac{S_2^2}{N_2}}}$$

$t = 5.80$
p-value < 0.0001

Reject H_o since $5.80 > 1.69$

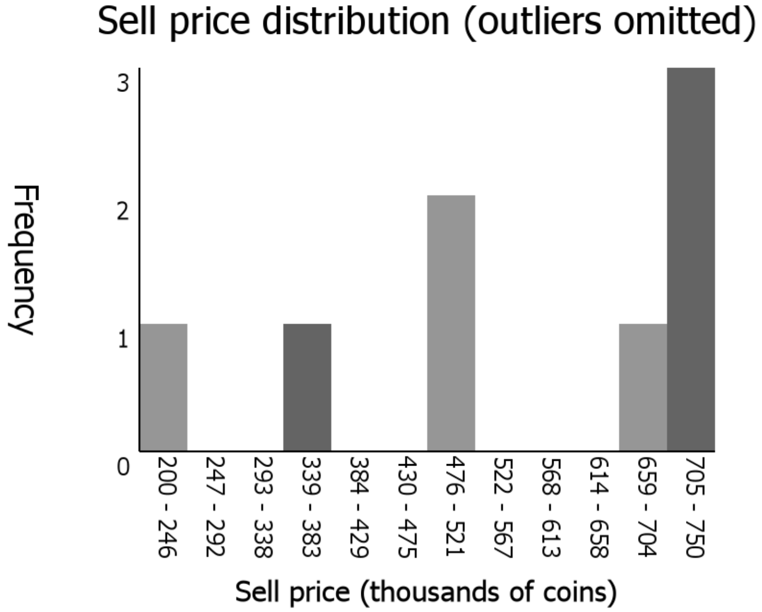
Inputs:
$\bar{x}_1$ = 33,087.4595 (coins)
$\bar{x}_2$ = 3,470.3582 (coins)
S_1 = 31,044.1968 (coins)
S_2 = 1,735.5877 (coins)
n_1 = 37
n_2 = 7,488

There is significant evidence at the α=0.05 level of significance to support the claim that the mean selling price of a voidwalker katana is greater than the mean cost of the materials required to make it.

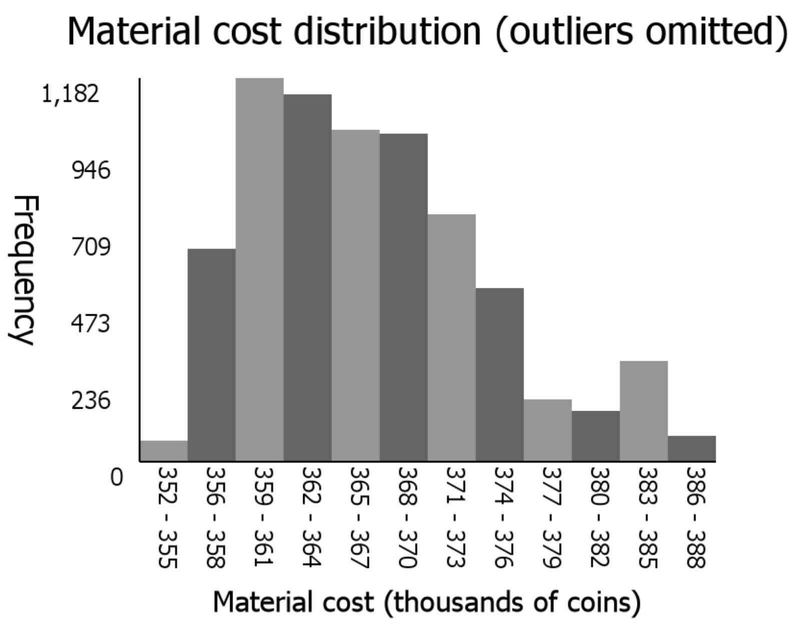
Since we rejected H_o, it suggests that on average people earned more coins from selling this item than it would have cost them to buy the materials.

Implication: the test suggests that on average we could make a profit from flipping this item.

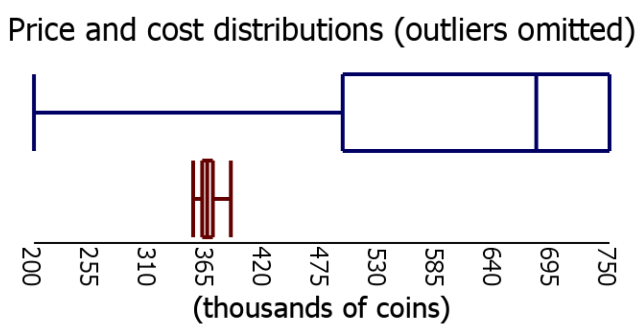
Selling prices and material costs of a venoms touch

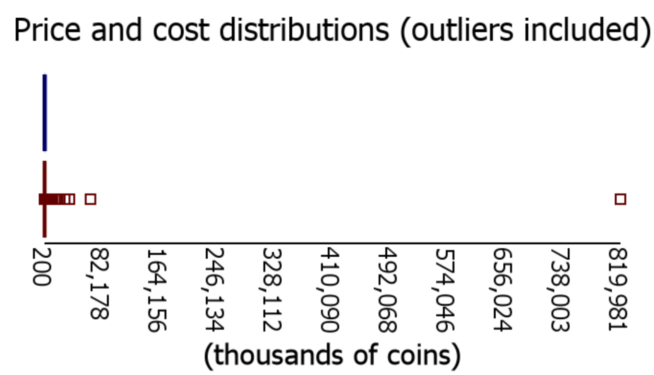


The distribution is centered around 680,000 coins (median). It has a low variability (IQR of 255,000 coins) and is skewed left. There are large gaps between 245,833 - 337,500 coins, 383,333 - 475,000 coins, and 520,833 - 658,333 coins. There are 0 outliers on the low end and 0 outliers on the high end.



The distribution is centered around 365,568 coins (median). It has a low variability (IQR of 10,198 coins) and is mostly symmetrical. There are no large gaps in the distribution. There are 1 outliers on the low end, the lowest being 206,976 coins and 382 outliers on the high end, the highest being 819,980,610 coins.





Key:

Sell Price

Material Cost

5 number summeries (thousands of coins):

min: 200, q1: 495, median: 680, q3: 750, max: 750

min: 352, q1: 361, median: 366, q3: 371, max: 388

Statistical test comparing the selling prices and material costs of a <u>venoms touch</u>

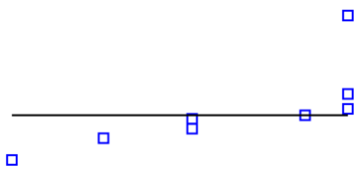
Let group1 = Sell prices of a venoms touch, group2 = Material cost of a venoms touch
X_1 = Sell price of a venoms touch (coins), X_2 = Material cost of a venoms touch (coins)
μ_1 = Mean sell price of a venoms touch (coins), μ_2 = Mean material cost of a venoms touch (coins)

$H_o: \mu_1 = \mu_2 \quad H_a: \mu_1 > \mu_2$

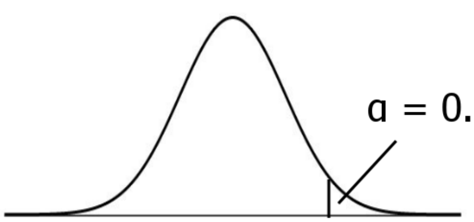
<u>Requirements for a difference of means test (σ_1 and σ_2 unknown):</u>

1. 2 independent SRS's: ✓ $n_1 = 8$ $n_2 = 7105$
   One price/cost from either group will not affect any price/cost from either group
2. σ is not known, but S_x is: ✓ S_1 = 208,682.089 coins S_2 = 7,238.3334 coins
3. Group1 is normally distributed and $n_2 > 30$: ✓

Quantile plot of sell prices $\quad n_2 = 7105 > 30$



<u>Rejection Critieria:</u>
$\alpha = 0.05 \quad df = 7$



Reject H_o if $t > 1.90$

<u>Test Statistic:</u>

$$t = \frac{(\bar{x}_1 - \bar{x}_2) - (\mu_1 - \mu_2)}{\sqrt{\frac{S_1^2}{N_1} + \frac{S_2^2}{N_2}}}$$

$t = 2.60$
p-value = 0.0176

Reject H_o since $2.60 > 1.90$

Inputs:
$\bar{x}_1$ = 558,750 (coins)
$\bar{x}_2$ = 366,578.0161 (coins)
S_1 = 208,682.089 (coins)
S_2 = 7,238.3334 (coins)
$n_1 = 8$
n_2 = 7,105

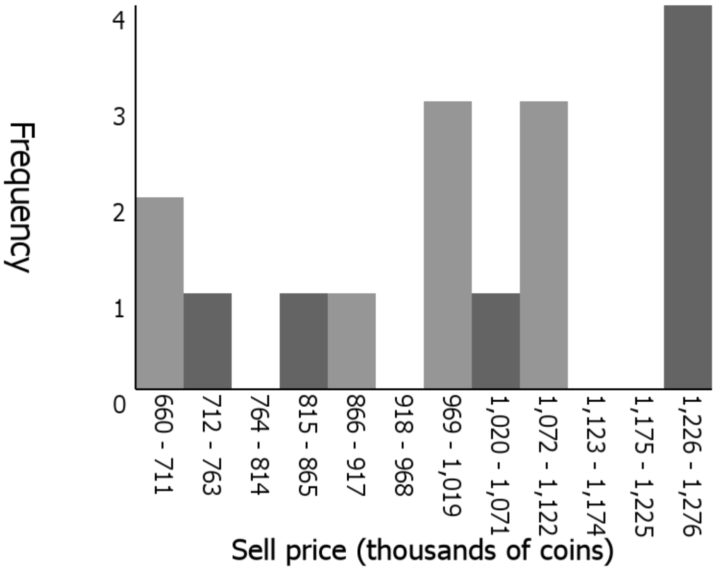
There is significant evidence at the α=0.05 level of significance to support the claim that the mean selling price of a venoms touch is greater than the mean cost of the materials required to make it.

Since we rejected H_o, it suggests that on average people earned more coins from selling this item than it would have cost them to buy the materials.

Implication: the test suggests that on average we could make a profit from flipping this item.

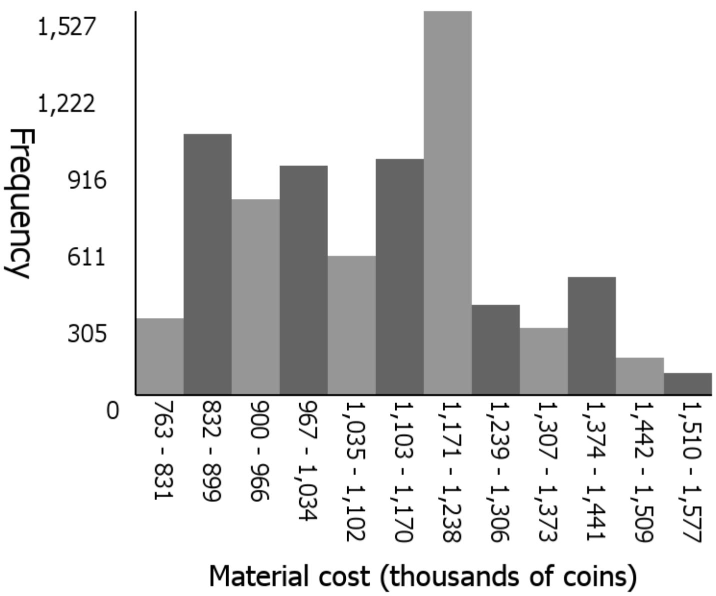
Selling prices and material costs of a <u>wise dragon boots</u>

Sell price distribution (outliers omitted)



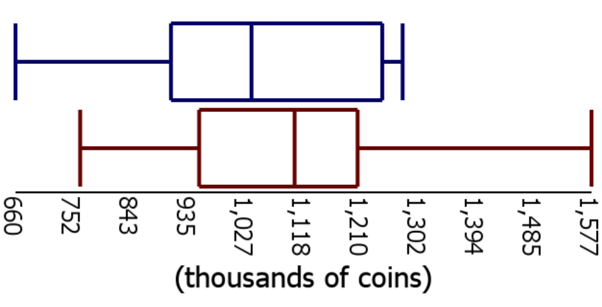
The distribution is centered around 1,035,683 coins (median). It has a low variability (IQR of 336,387 coins) and is mostly symmetrical. There are large gaps between 762,714 - 814,070 coins, 916,784 - 968,141 coins, and 1,122,211 - 1,224,924 coins. There are 0 outliers on the low end and 0 outliers on the high end.

Material cost distribution (outliers omitted)

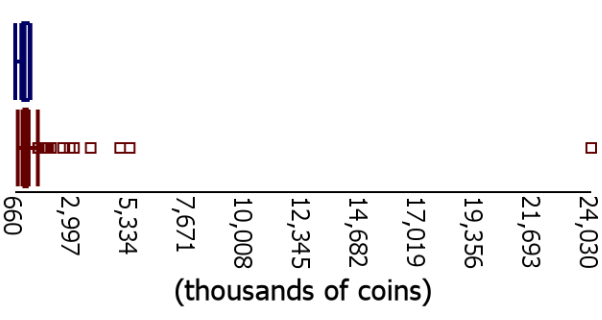


The distribution is centered around 1,104,310 coins (median). It has a low variability (IQR of 252,216 coins) and is mostly symmetrical. There are no large gaps in the distribution. There are 0 outliers on the low end and 100 outliers on the high end, the highest being 24,030,056 coins.

Price and cost distributions (outliers omitted)



Price and cost distributions (outliers included)



Key:

Sell Price

Material Cost

5 number summeries (thousands of coins):

min: 660, q1: 908, median: 1,036, q3: 1,244, max: 1,276

min: 763, q1: 952, median: 1,104, q3: 1,205, max: 1,577

Statistical test comparing the selling prices and material costs of a wise dragon boots

Let group1 = Sell prices of a wise dragon boots, group2 = Material cost of a wise dragon boots
X_1 = Sell price of a wise dragon boots (coins), X_2 = Material cost of a wise dragon boots (coins)
μ_1 = Mean sell price of a wise dragon boots (coins), μ_2 = Mean material cost of a wise dragon boots (coins)

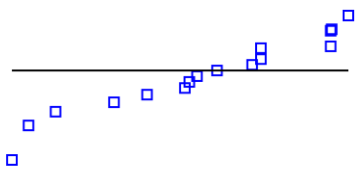
H_o: $\mu_1 = \mu_2$ H_a: $\mu_1 > \mu_2$

Requirements for a difference of means test (σ_1 and σ_2 unknown):

1. 2 independent SRS's: ✓ $n_1 = 16$ $n_2 = 7388$
   One price/cost from either group will not affect any price/cost from either group
2. σ is not known, but S_x is: ✓ S_1 = 200,590.6179 coins S_2 = 176,130.9595 coins
3. Group1 is normally distributed and $n_2 > 30$: ✓

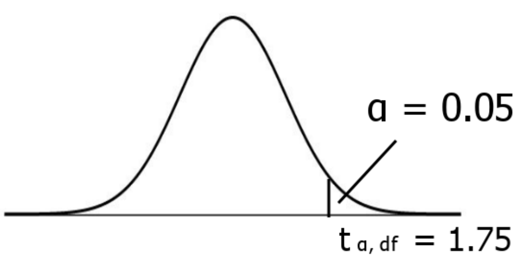
Quantile plot of sell prices

$n_2 = 7388 > 30$



Rejection Critieria:

$\alpha = 0.05$ df = 15



Reject H_o if $t > 1.75$

Test Statistic:

$$t = \frac{(\bar{x}_1 - \bar{x}_2) - (\mu_1 - \mu_2)}{\sqrt{\frac{S_1^2}{N_1} + \frac{S_2^2}{N_2}}}$$

$t = -1.70$
p-value = 0.9447

Inputs:

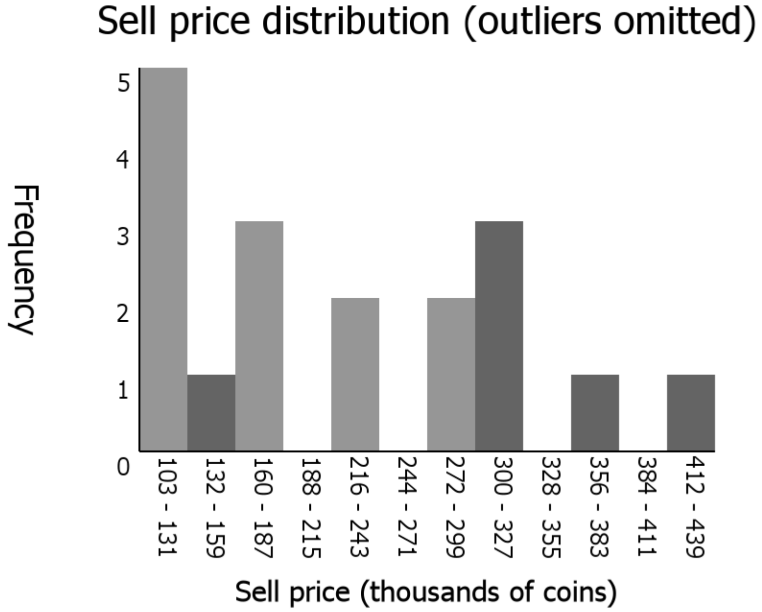
$\bar{x}_1$ = 1,011,462.8125 (coins)
$\bar{x}_2$ = 1,096,547.7129 (coins)
S_1 = 200,590.6179 (coins)
S_2 = 176,130.9595 (coins)
$n_1 = 16$
n_2 = 7,388

Fail to reject H_o since $-1.70 < 1.75$

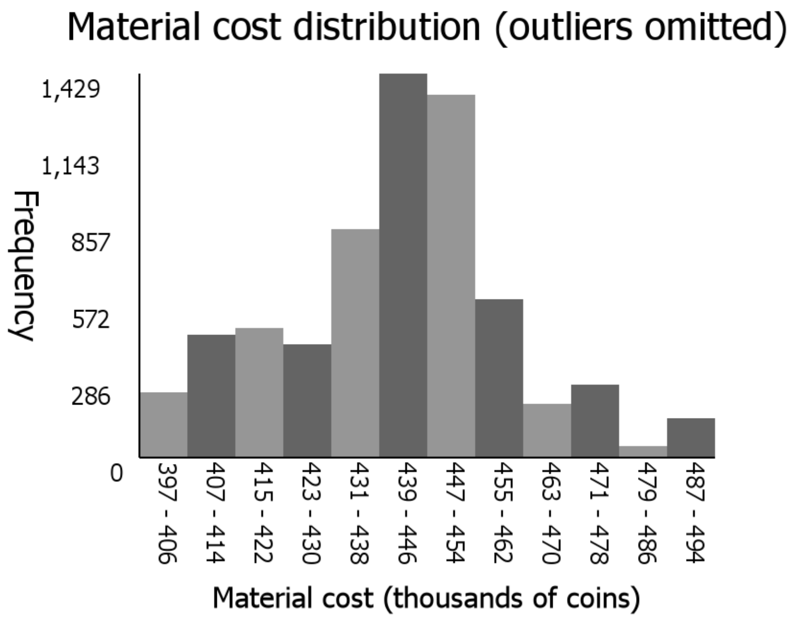
There is not significant evidence at the α=0.05 level of significance to support the claim that the mean selling price of a wise dragon boots is greater than the mean cost of the materials required to make it.

Since we failed to reject H_o, it suggests that on average people did not earn more coins from selling this item than it would have cost them to buy the materials.

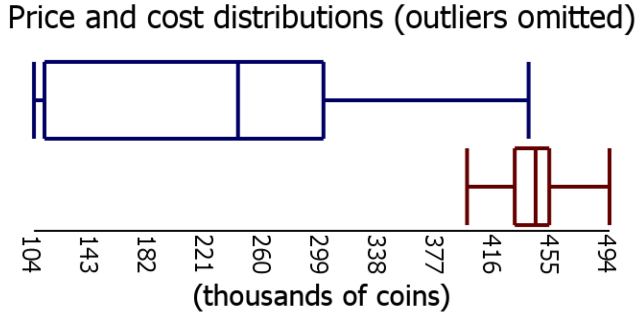
Selling prices and material costs of an old dragon leggings

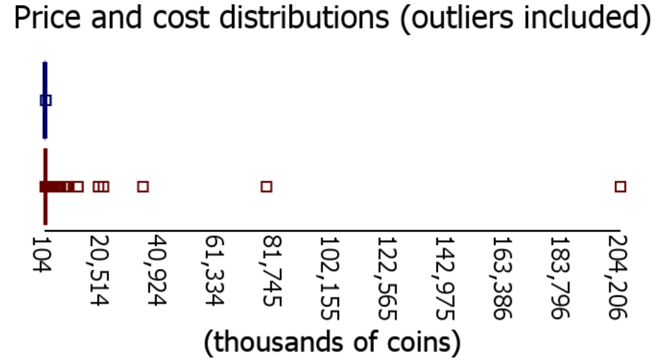


The distribution is centered around 242,000 coins (median). It has a low variability (IQR of 189,373 coins) and is skewed left. There are large gaps between 187,433 - 215,410 coins, 243,388 - 271,365 coins, 327,320 - 355,298 coins, and 383,275 - 411,253 coins. There are 0 outliers on the low end and 2 outliers on the high end, the highest being 611,593 coins.



The distribution is centered around 443,981 coins (median). It has a low variability (IQR of 23,436 coins) and is mostly symmetrical. There are no large gaps in the distribution. There are 48 outliers on the low end, the lowest being 377,930 coins and 951 outliers on the high end, the highest being 204,206,130 coins.





Key:

Sell Price

Material Cost

5 number summeries (thousands of coins):

min: 104, q1: 111, median: 242, q3: 300, max: 439

min: 397, q1: 430, median: 444, q3: 453, max: 494

Statistical test comparing the selling prices and material costs of an <u>old dragon leggings</u>

Let group1 = Sell prices of an old dragon leggings, group2 = Material cost of an old dragon leggings
X_1 = Sell price of an old dragon leggings (coins), X_2 = Material cost of an old dragon leggings (coins)
μ_1 = Mean sell price of an old dragon leggings (coins), μ_2 = Mean material cost of an old dragon leggings (coins)

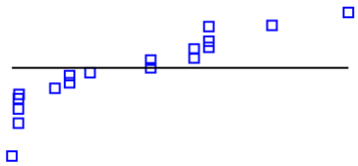
H_o: $\mu_1 = \mu_2$ H_a: $\mu_1 > \mu_2$

<u>Requirements for a difference of means test (σ_1 and σ_2 unknown):</u>

1. 2 independent SRS's: ✓ $n_1 = 18$ $n_2 = 6489$
   One price/cost from either group will not affect any price/cost from either group
2. σ is not known, but S_x is: ✓ S_1 = 100,845.9311 coins S_2 = 18,793.7767 coins
3. Group1 is normally distributed and $n_2 > 30$: ✓

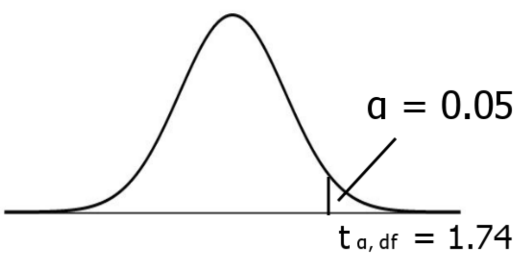
Quantile plot of sell prices

$n_2 = 6489 > 30$



<u>Rejection Critieria:</u>

$\alpha = 0.05$ df = 17



Reject H_o if $t > 1.74$

<u>Test Statistic:</u>

$$t = \frac{(\bar{x}_1 - \bar{x}_2) - (\mu_1 - \mu_2)}{\sqrt{\frac{S_1^2}{N_1} + \frac{S_2^2}{N_2}}}$$

$t = -9.32$
p-value > 0.9999

Inputs:

$\bar{x}_1$ = 219,499.6111 (coins)
$\bar{x}_2$ = 441,160.3512 (coins)
S_1 = 100,845.9311 (coins)
S_2 = 18,793.7767 (coins)
n_1 = 18
n_2 = 6,489

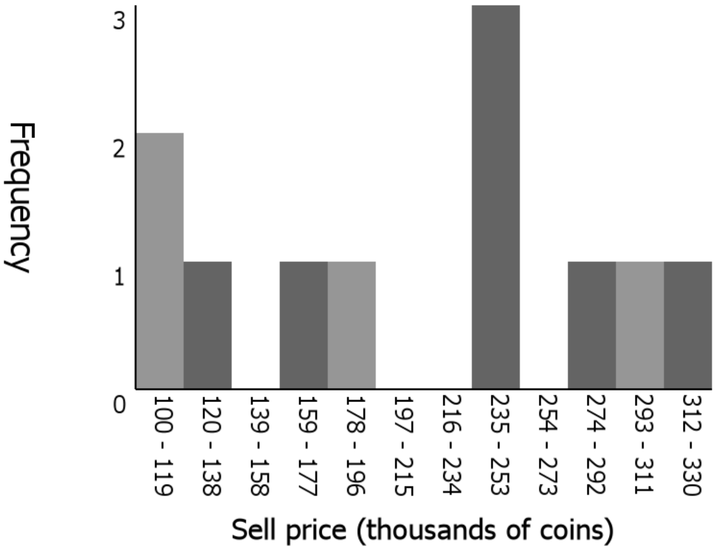
Fail to reject H_o since $-9.32 < 1.74$

There is not significant evidence at the α=0.05 level of significance to support the claim that the mean selling price of an old dragon leggings is greater than the mean cost of the materials required to make it.

Since we failed to reject H_o, it suggests that on average people did not earn more coins from selling this item than it would have cost them to buy the materials.

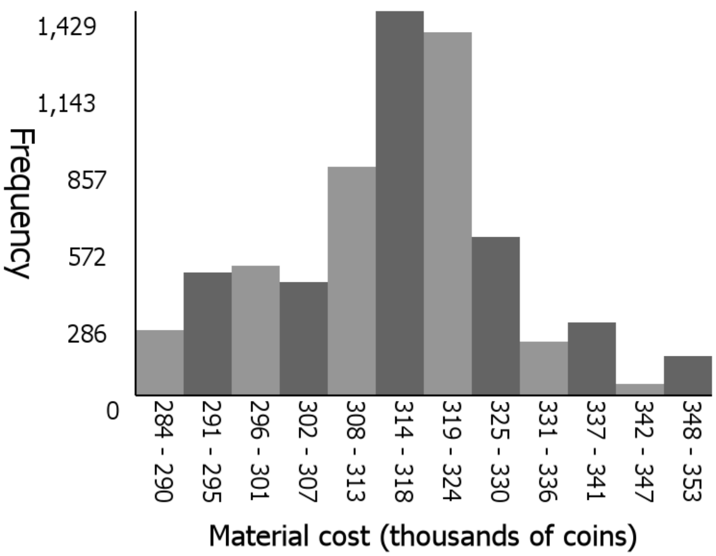
Selling prices and material costs of an old dragon helmet

Sell price distribution (outliers omitted)



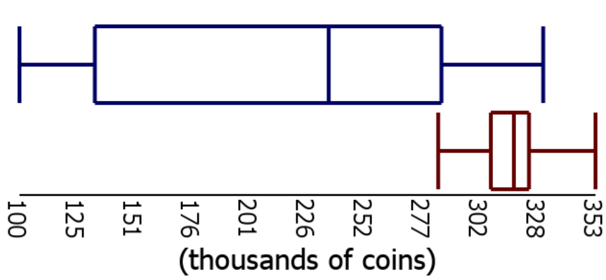
The distribution is centered around 235,795 coins (median). It has a low variability (IQR of 152,213 coins) and is skewed left. There are large gaps between 138,333 - 157,500 coins, 195,833 - 234,167 coins, and 253,333 - 272,500 coins. There are 0 outliers on the low end and 0 outliers on the high end.

Material cost distribution (outliers omitted)

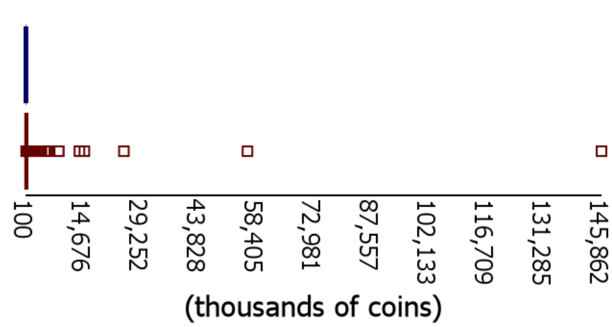


The distribution is centered around 317,130 coins (median). It has a low variability (IQR of 16,740 coins) and is mostly symmetrical. There are no large gaps in the distribution. There are 48 outliers on the low end, the lowest being 269,950 coins and 951 outliers on the high end, the highest being 145,861,521 coins.

Price and cost distributions (outliers omitted)



Price and cost distributions (outliers included)



Key:

Sell Price

Material Cost

5 number summeries (thousands of coins):

min: 100, q1: 133, median: 236, q3: 285, max: 330

min: 284, q1: 307, median: 317, q3: 324, max: 353

Statistical test comparing the selling prices and material costs of an old dragon helmet

Let group1 = Sell prices of an old dragon helmet, group2 = Material cost of an old dragon helmet

X_1 = Sell price of an old dragon helmet (coins), X_2 = Material cost of an old dragon helmet (coins)

μ_1 = Mean sell price of an old dragon helmet (coins), μ_2 = Mean material cost of an old dragon helmet (coins)

H_o: $\mu_1 = \mu_2$ H_a: $\mu_1 > \mu_2$

Requirements for a difference of means test (σ_1 and σ_2 unknown):

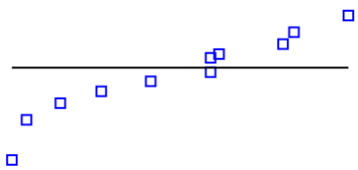
1. 2 independent SRS's: ✓ $n_1 = 11$ $n_2 = 6489$

   One price/cost from either group will not affect any price/cost from either group

2. σ is not known, but S_x is: ✓ S_1 = 77,387.2436 coins S_2 = 13,424.124 coins

3. Group1 is normally distributed and $n_2 > 30$: ✓

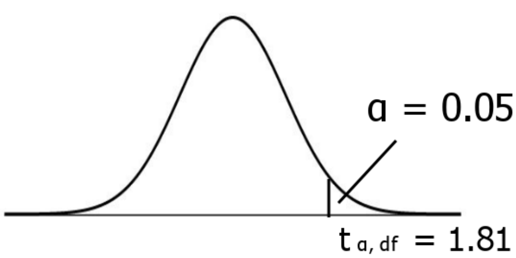
Quantile plot of sell prices



$n_2 = 6489 > 30$

Rejection Critieria:

$\alpha = 0.05$ df = 10



Reject H_o if $t > 1.81$

Test Statistic:

$$t = \frac{(\bar{x}_1 - \bar{x}_2) - (\mu_1 - \mu_2)}{\sqrt{\frac{S_1^2}{N_1} + \frac{S_2^2}{N_2}}}$$

$t = -4.46$

p-value = 0.9994

Inputs:

$\bar{x}_1$ = 210,938.4545 (coins)

$\bar{x}_2$ = 315,114.5513 (coins)

S_1 = 77,387.2436 (coins)

S_2 = 13,424.124 (coins)

$n_1 = 11$

n_2 = 6,489

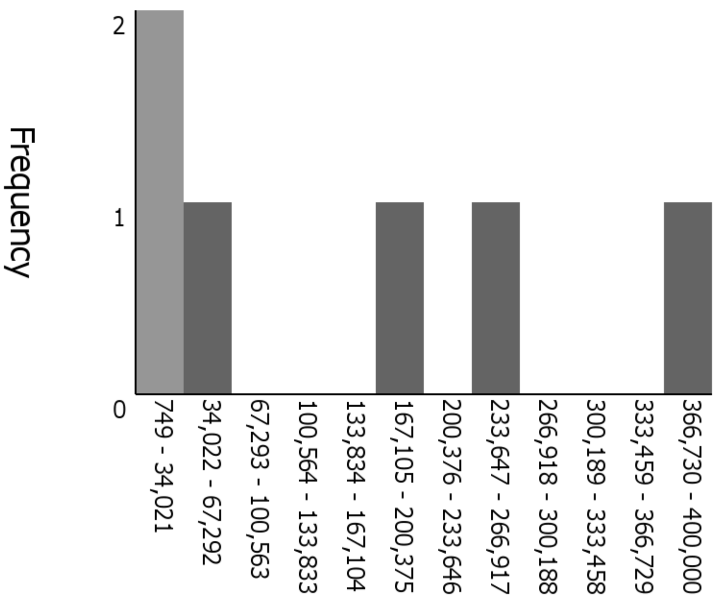
Fail to reject H_o since $-4.46 < 1.81$

There is not significant evidence at the α=0.05 level of significance to support the claim that the mean selling price of an old dragon helmet is greater than the mean cost of the materials required to make it.

Since we failed to reject H_o, it suggests that on average people did not earn more coins from selling this item than it would have cost them to buy the materials.

Selling prices and material costs of a rabbit boots

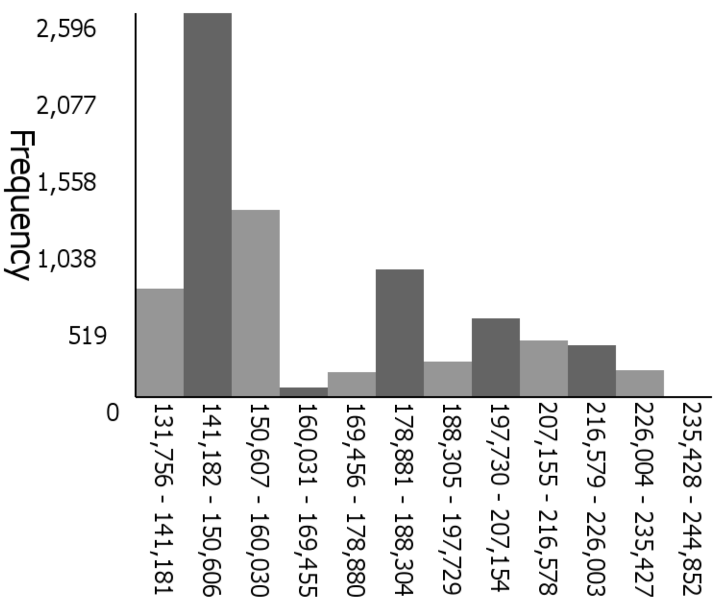
Sell price distribution (outliers omitted)



Sell price (coins)

The distribution is centered around 175,692 coins (median). It has a low variability (IQR of 241,240 coins) and is skewed left. There are large gaps between 67,292 - 167,104 coins, 200,375 - 233,646 coins, and 266,917 - 366,729 coins. There are 0 outliers on the low end and 0 outliers on the high end.

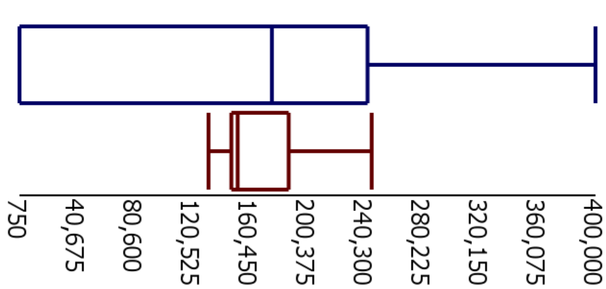
Material cost distribution (outliers omitted)



Material cost (coins)

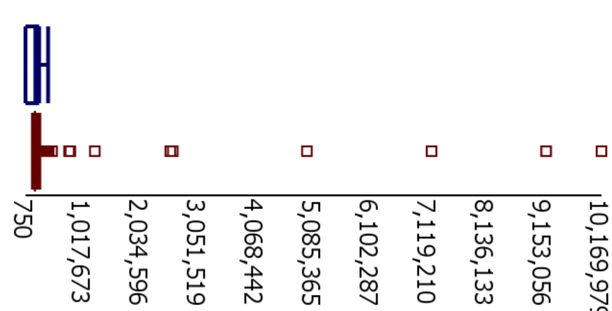
The distribution is centered around 151,978 coins (median). It has a low variability (IQR of 39,748 coins) and is skewed right. There are no large gaps in the distribution. There are 0 outliers on the low end and 101 outliers on the high end, the highest being 10,169,979 coins.

Price and cost distributions (outliers omitted)



(coins)

Price and cost distributions (outliers included)



(coins)

Key:

Sell Price

Material Cost

5 number summeries (coins):

min: 750, q1: 760, median: 175,692, q3: 242,000, max: 400,000

min: 131,757, q1: 147,590, median: 151,978, q3: 187,338, max: 244,852

Statistical test comparing the selling prices and material costs of a rabbit boots

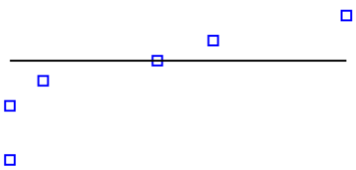
Let group1 = Sell prices of a rabbit boots, group2 = Material cost of a rabbit boots
X_1 = Sell price of a rabbit boots (coins), X_2 = Material cost of a rabbit boots (coins)
μ_1 = Mean sell price of a rabbit boots (coins), μ_2 = Mean material cost of a rabbit boots (coins)

H_o: $\mu_1 = \mu_2$ H_a: $\mu_1 > \mu_2$

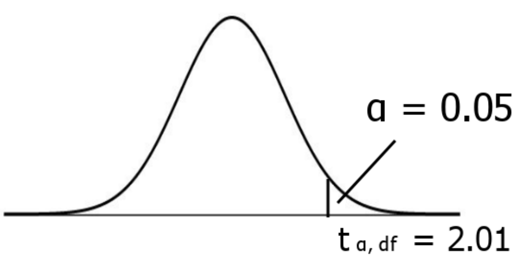
Requirements for a difference of means test (σ_1 and σ_2 unknown):

1. 2 independent SRS's: ✓ $n_1 = 6$ $n_2 = 7387$
   One price/cost from either group will not affect any price/cost from either group
2. σ is not known, but S_x is: ✓ S_1 = 159,967.3655 coins S_2 = 27,329.8102 coins
3. Group1 is normally distributed and $n_2 > 30$: ✓

Quantile plot of sell prices $n_2 = 7387 > 30$



Rejection Critieria:
$\alpha = 0.05$ df = 5



Reject H_o if $t > 2.01$

Test Statistic:

$$t = \frac{(\bar{x}_1 - \bar{x}_2) - (\mu_1 - \mu_2)}{\sqrt{\frac{S_1^2}{N_1} + \frac{S_2^2}{N_2}}}$$

$t = -0.36$
p-value = 0.6333

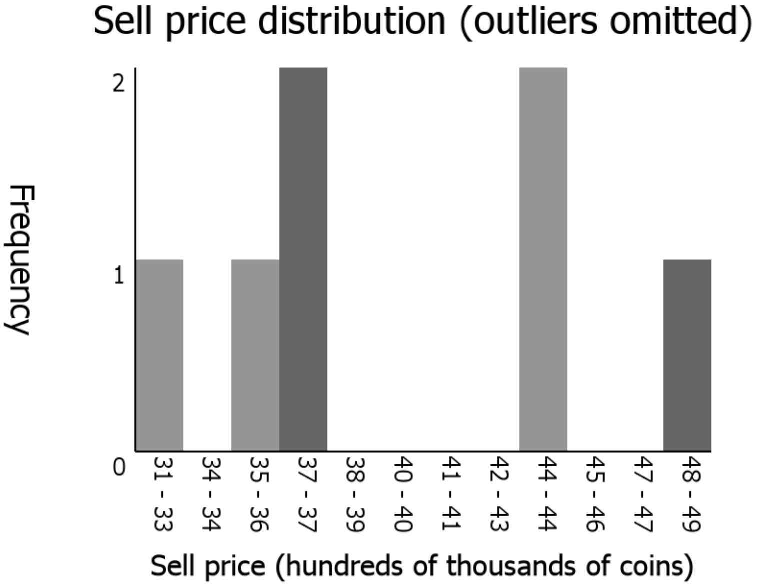
Inputs:
$\bar{x}_1$ = 143,238.3333 (coins)
$\bar{x}_2$ = 166,762.5716 (coins)
S_1 = 159,967.3655 (coins)
S_2 = 27,329.8102 (coins)
$n_1 = 6$
n_2 = 7,387

Fail to reject H_o since $-0.36 < 2.01$

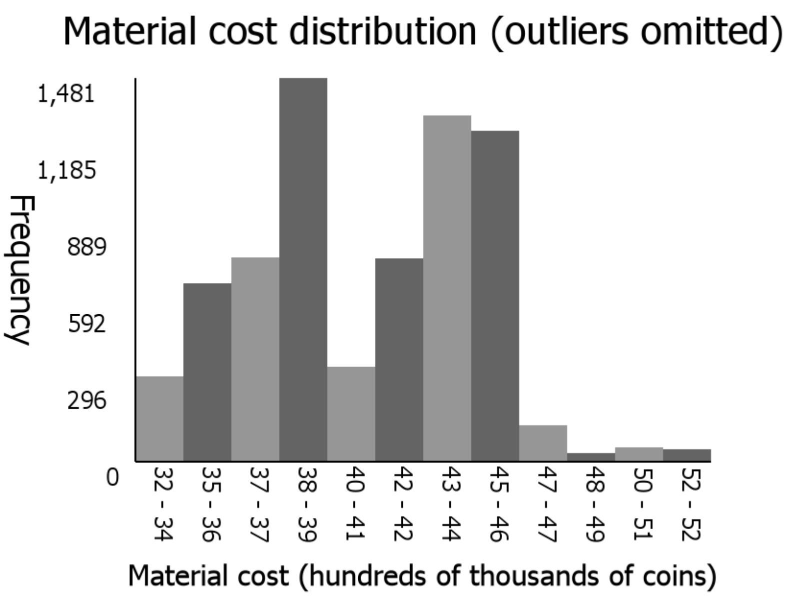
There is not significant evidence at the α=0.05 level of significance to support the claim that the mean selling price of a rabbit boots is greater than the mean cost of the materials required to make it.

Since we failed to reject H_o, it suggests that on average people did not earn more coins from selling this item than it would have cost them to buy the materials.

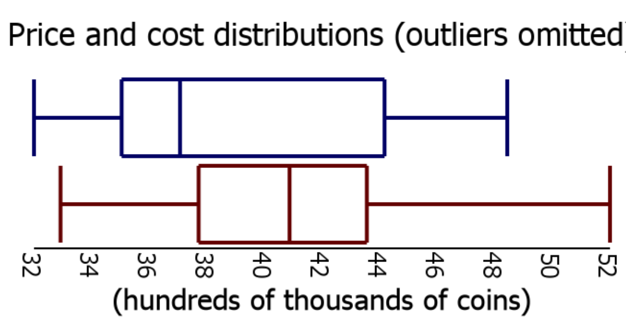
Selling prices and material costs of a ruby drill tx-

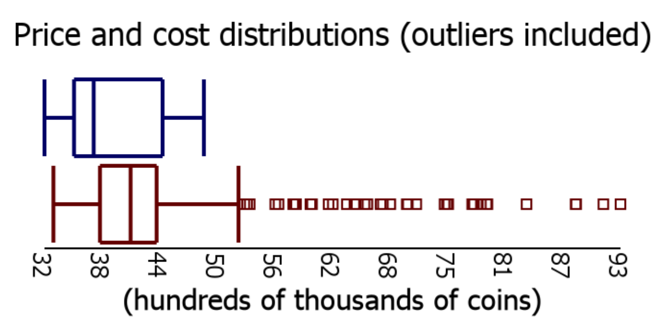


The distribution is centered around 3,675,000 coins (median). It has a low variability (IQR of 945,000 coins) and is skewed right. There are large gaps between 3,291,750 - 3,433,500 coins, 3,717,000 - 4,284,000 coins, and 4,425,750 - 4,709,250 coins. There are 0 outliers on the low end and 0 outliers on the high end.



The distribution is centered around 4,068,617 coins (median). It has a low variability (IQR of 604,531 coins) and is mostly symmetrical. There are no large gaps in the distribution. There are 0 outliers on the low end and 158 outliers on the high end, the highest being 9,295,766 coins.





Key:

Sell Price

Material Cost

5 number summeries (hundreds of thousands of coins):

min: 32, q1: 35, median: 37, q3: 44, max: 49

min: 32, q1: 37, median: 41, q3: 43, max: 52

Statistical test comparing the selling prices and material costs of a ruby drill tx-

Let group1 = Sell prices of a ruby drill tx-, group2 = Material cost of a ruby drill tx-

X_1 = Sell price of a ruby drill tx- (coins), X_2 = Material cost of a ruby drill tx- (coins)

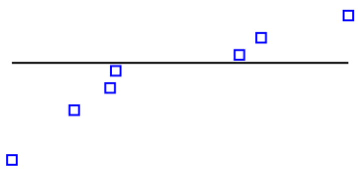
μ_1 = Mean sell price of a ruby drill tx- (coins), μ_2 = Mean material cost of a ruby drill tx- (coins)

H_o: $\mu_1 = \mu_2$ H_a: $\mu_1 > \mu_2$

Requirements for a difference of means test (σ_1 and σ_2 unknown):

1. 2 independent SRS's: ✓ $n_1 = 7$ $n_2 = 7330$
   One price/cost from either group will not affect any price/cost from either group
2. σ is not known, but S_x is: ✓ S_1 = 603,535.4482 coins S_2 = 383,674.7041 coins
3. Group1 is normally distributed and $n_2 > 30$: ✓

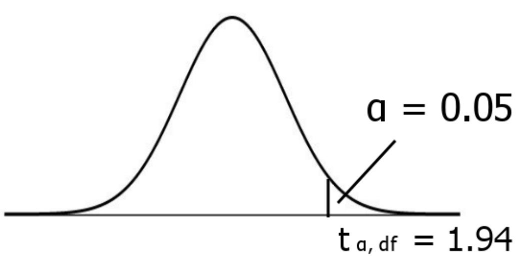
Quantile plot of sell prices



$n_2 = 7330 > 30$

Rejection Critieria:

$\alpha = 0.05$ df = 6



Reject H_o if $t > 1.94$

Test Statistic:

$$t = \frac{(\bar{x}_1 - \bar{x}_2) - (\mu_1 - \mu_2)}{\sqrt{\frac{S_1{}^2}{N_1} + \frac{S_2{}^2}{N_2}}}$$

$t = -0.51$
p-value = 0.6848

Inputs:

$\bar{x}_1$ = 3,928,217 (coins)
$\bar{x}_2$ = 4,043,867.5924 (coins)
S_1 = 603,535.4482 (coins)
S_2 = 383,674.7041 (coins)
$n_1 = 7$
n_2 = 7,330

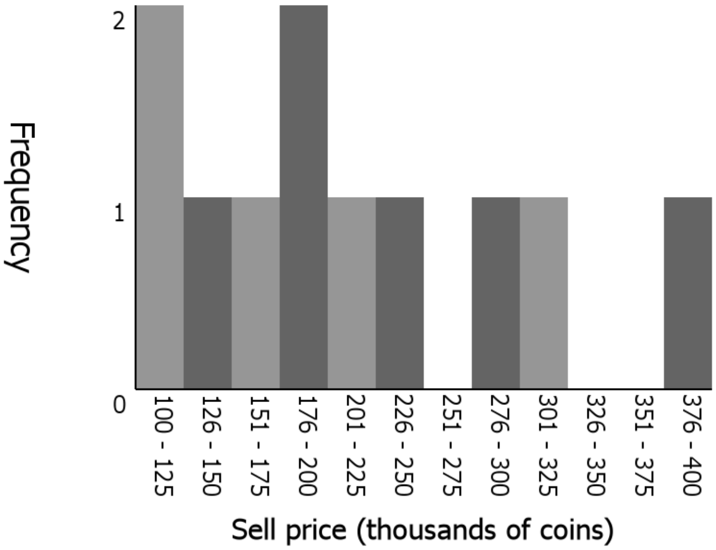
Fail to reject H_o since $-0.51 < 1.94$

There is not significant evidence at the α=0.05 level of significance to support the claim that the mean selling price of a ruby drill tx- is greater than the mean cost of the materials required to make it.

Since we failed to reject H_o, it suggests that on average people did not earn more coins from selling this item than it would have cost them to buy the materials.

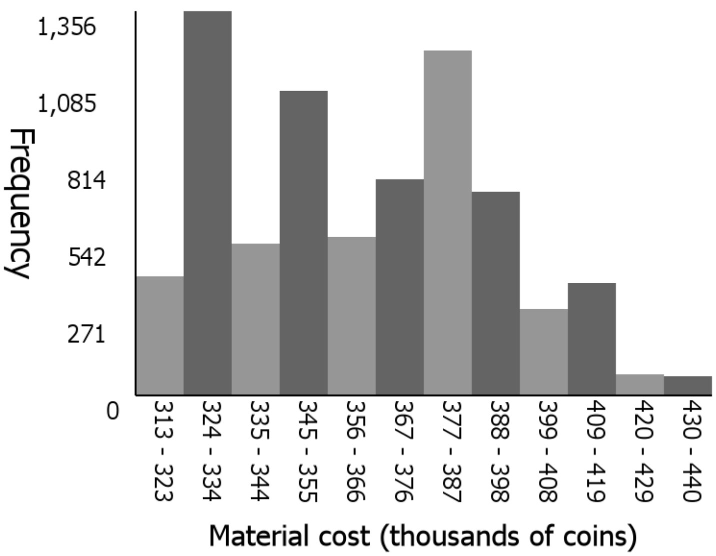
Selling prices and material costs of a golem sword

Sell price distribution (outliers omitted)



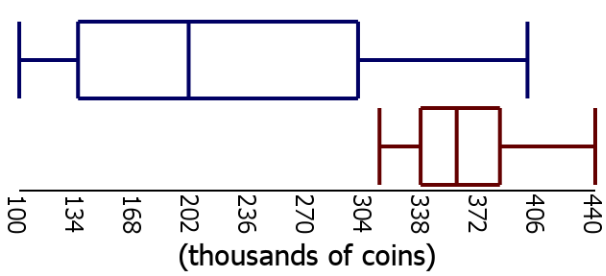
The distribution is centered around 200,000 coins (median). It has a low variability (IQR of 165,303 coins) and is skewed right. There are large gaps between 250,000 - 275,000 coins and 325,000 - 375,000 coins. There are 0 outliers on the low end and 0 outliers on the high end.

Material cost distribution (outliers omitted)

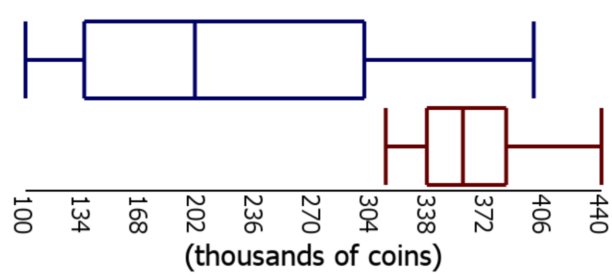


The distribution is centered around 358,211 coins (median). It has a low variability (IQR of 46,815 coins) and is mostly symmetrical. There are no large gaps in the distribution. There are 0 outliers on the low end and 0 outliers on the high end.

Price and cost distributions (outliers omitted)



Price and cost distributions (outliers included)



Key:

Sell Price

Material Cost

5 number summeries (thousands of coins):

min: 100, q1: 135, median: 200, q3: 300, max: 400

min: 313, q1: 337, median: 358, q3: 384, max: 440

Statistical test comparing the selling prices and material costs of a golem sword

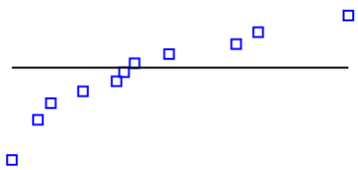
Let group1 = Sell prices of a golem sword, group2 = Material cost of a golem sword
X_1 = Sell price of a golem sword (coins), X_2 = Material cost of a golem sword (coins)
μ_1 = Mean sell price of a golem sword (coins), μ_2 = Mean material cost of a golem sword (coins)

H_o: $\mu_1 = \mu_2$ H_a: $\mu_1 > \mu_2$

Requirements for a difference of means test (σ_1 and σ_2 unknown):

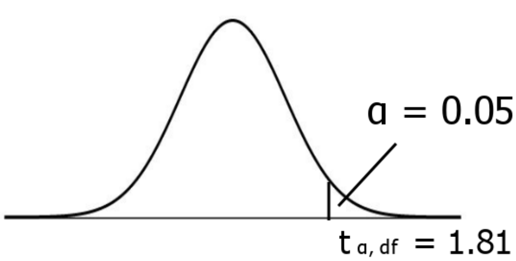
1. 2 independent SRS's: ✓ $n_1 = 11$ $n_2 = 7488$
   One price/cost from either group will not affect any price/cost from either group
2. σ is not known, but S_x is: ✓ S_1 = 91,915.1904 coins S_2 = 28,345.7563 coins
3. Group1 is normally distributed and $n_2 > 30$: ✓

Quantile plot of sell prices



$n_2 = 7488 > 30$

Rejection Critieria:
$\alpha = 0.05$ df = 10



Reject H_o if $t > 1.81$

Test Statistic:

$$t = \frac{(\bar{x}_1 - \bar{x}_2) - (\mu_1 - \mu_2)}{\sqrt{\frac{S_1^2}{N_1} + \frac{S_2^2}{N_2}}}$$

$t = -5.26$
p-value = 0.9998

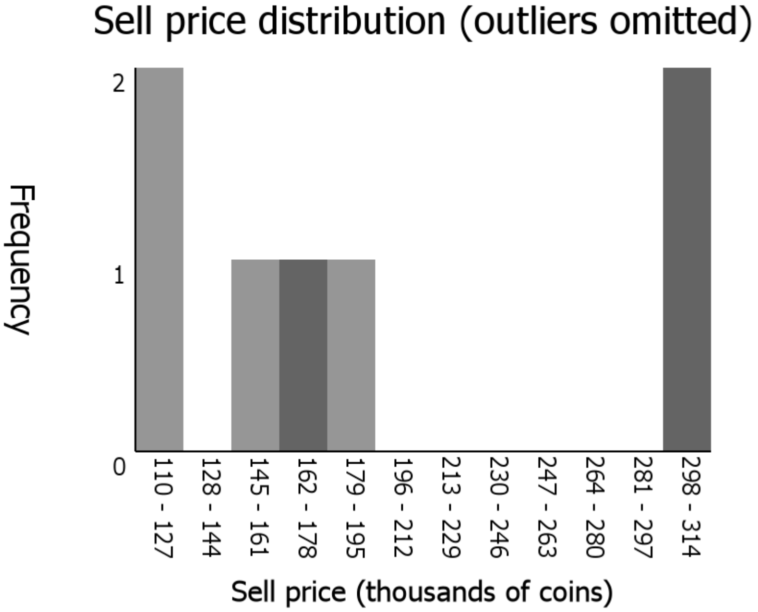
Inputs:
$\bar{x}_1$ = 216,691.1818 (coins)
$\bar{x}_2$ = 362,510.7937 (coins)
S_1 = 91,915.1904 (coins)
S_2 = 28,345.7563 (coins)
n_1 = 11
n_2 = 7,488

Fail to reject H_o since $-5.26 < 1.81$

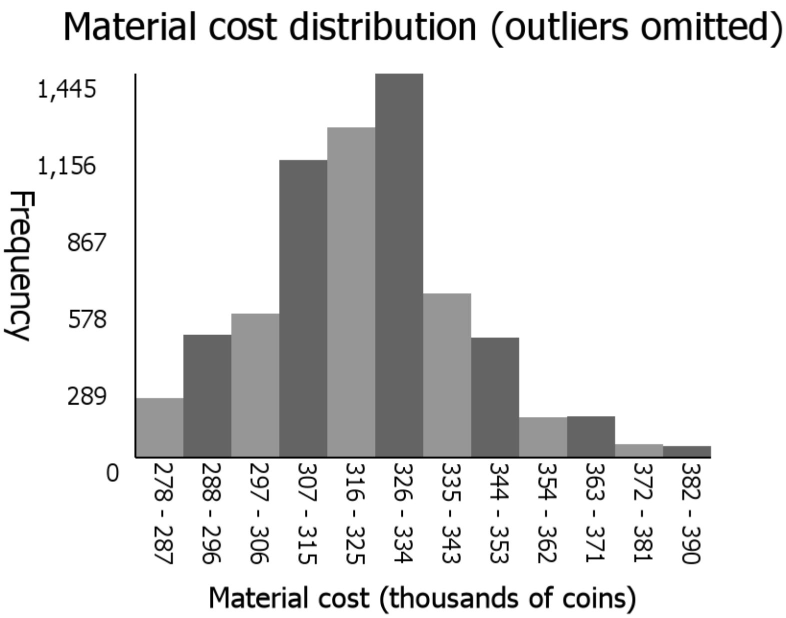
There is not significant evidence at the α=0.05 level of significance to support the claim that the mean selling price of a golem sword is greater than the mean cost of the materials required to make it.

Since we failed to reject H_o, it suggests that on average people did not earn more coins from selling this item than it would have cost them to buy the materials.

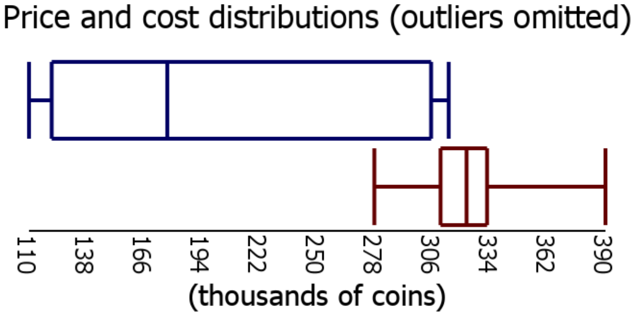
Selling prices and material costs of a protector dragon helmet

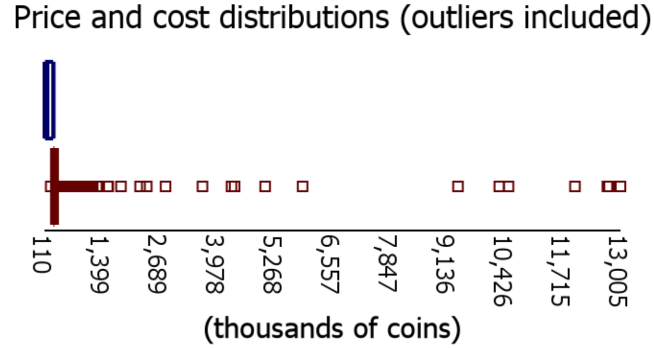


The distribution is centered around 177,156 coins (median). It has a low variability (IQR of 184,305 coins) and is skewed right. There are large gaps between 126,987 - 143,974 coins and 194,935 - 296,857 coins. There are 0 outliers on the low end and 0 outliers on the high end.



The distribution is centered around 322,531 coins (median). It has a low variability (IQR of 22,581 coins) and is mostly symmetrical. There are no large gaps in the distribution. There are 8 outliers on the low end, the lowest being 249,855 coins and 975 outliers on the high end, the highest being 13,004,955 coins.





Key:

Sell Price

Material Cost

5 number summeries (thousands of coins):

min: 110, q1: 121, median: 177, q3: 305, max: 314

min: 278, q1: 310, median: 323, q3: 332, max: 390

Statistical test comparing the selling prices and material costs of a protector dragon helmet

Let group1 = Sell prices of a protector dragon helmet, group2 = Material cost of a protector dragon helmet

X_1 = Sell price of a protector dragon helmet (coins), X_2 = Material cost of a protector dragon helmet (coins)

μ_1 = Mean sell price of a protector dragon helmet (coins),

μ_2 = Mean material cost of a protector dragon helmet (coins)

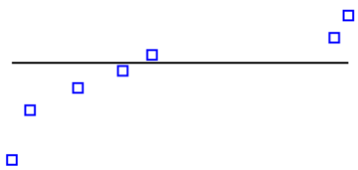
$H_o: \mu_1 = \mu_2$ $\quad H_a: \mu_1 > \mu_2$

Requirements for a difference of means test (σ_1 and σ_2 unknown):

1. 2 independent SRS's: ✓ $n_1 = 7$ $n_2 = 6505$

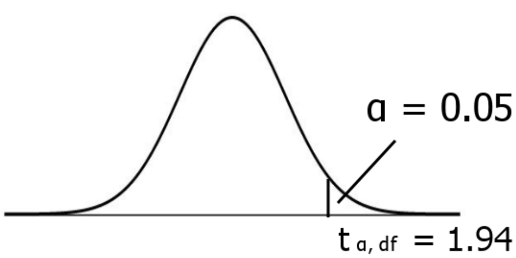
   One price/cost from either group will not affect any price/cost from either group
2. σ is not known, but S_x is: ✓ $S_1 = 82{,}994.1319$ coins $S_2 = 19{,}642.3679$ coins
3. Group1 is normally distributed and $n_2 > 30$: ✓

Quantile plot of sell prices $\quad n_2 = 6505 > 30$



Rejection Critieria:

$\alpha = 0.05$ df = 6



Reject H_o if $t > 1.94$

Test Statistic:

$$t = \frac{(\bar{x}_1 - \bar{x}_2) - (\mu_1 - \mu_2)}{\sqrt{\frac{S_1{}^2}{N_1} + \frac{S_2{}^2}{N_2}}}$$

$t = -4.03$

p-value = 0.9965

Inputs:

$\bar{x}_1 = 196{,}025.2857$ (coins)

$\bar{x}_2 = 322{,}353.0996$ (coins)

$S_1 = 82{,}994.1319$ (coins)

$S_2 = 19{,}642.3679$ (coins)

$n_1 = 7$

$n_2 = 6{,}505$

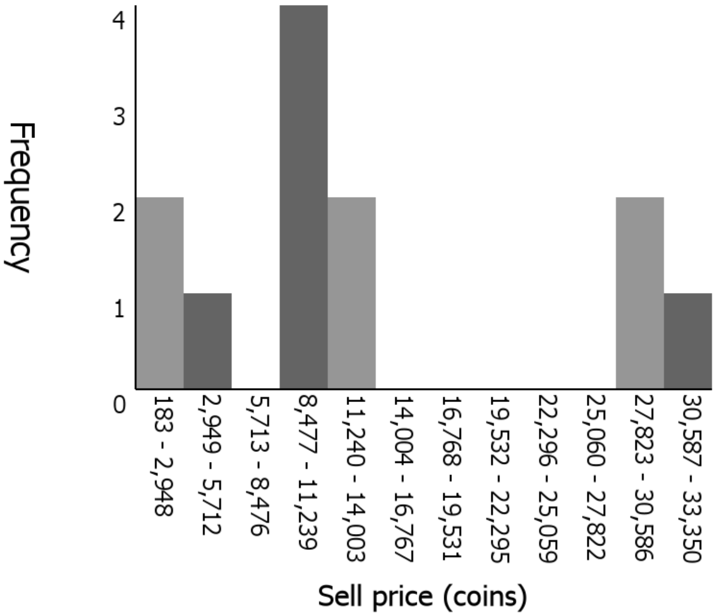
Fail to reject H_o since $-4.03 < 1.94$

There is not significant evidence at the α=0.05 level of significance to support the claim that the mean selling price of a protector dragon helmet is greater than the mean cost of the materials required to make it.

Since we failed to reject H_o, it suggests that on average people did not earn more coins from selling this item than it would have cost them to buy the materials.

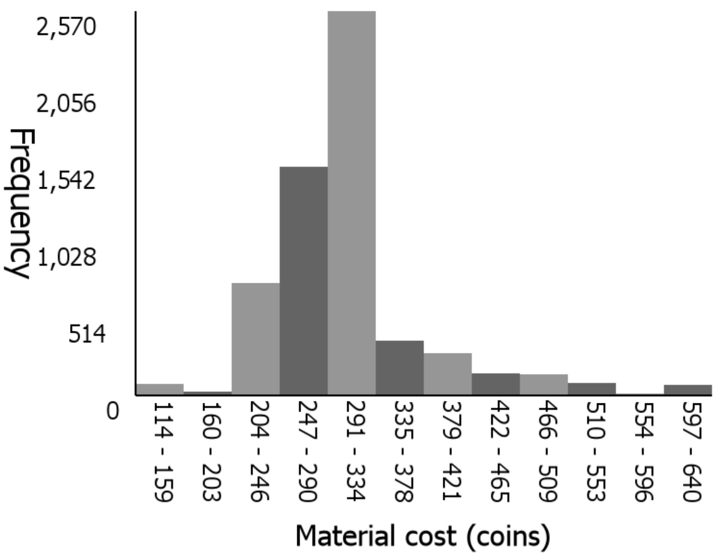
Selling prices and material costs of a prismarine blade

Sell price distribution (outliers omitted)



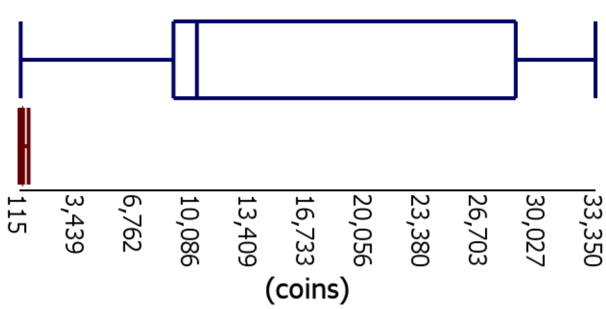
The distribution is centered around 10,350 coins (median). It has a low variability (IQR of 19,750 coins) and is skewed right. There are large gaps between 5,712 - 8,476 coins and 14,003 - 27,822 coins. There are 0 outliers on the low end and 2 outliers on the high end, the highest being 1,000,000 coins.

Material cost distribution (outliers omitted)

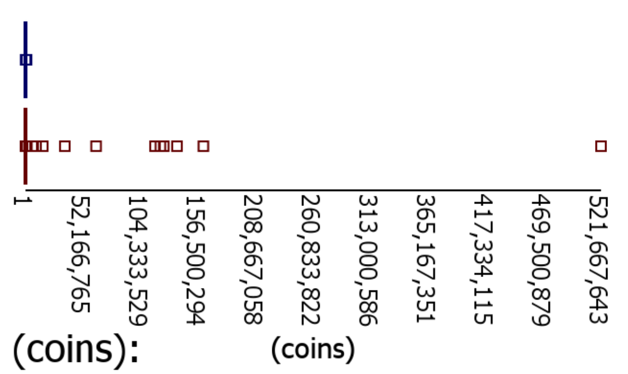


The distribution is centered around 307 coins (median). It has a low variability (IQR of 61 coins) and is mostly symmetrical. There are no large gaps in the distribution. There are 1 outliers on the low end, the lowest being 1 coins and 1424 outliers on the high end, the highest being 521,667,643 coins.

Price and cost distributions (outliers omitted)



Price and cost distributions (outliers included)



Key:

Sell Price

Material Cost

5 number summeries (coins):

min: 184, q1: 9,000, median: 10,350, q3: 28,750, max: 33,350

min: 115, q1: 262, median: 307, q3: 323, max: 640

Statistical test comparing the selling prices and material costs of a prisinarine blade

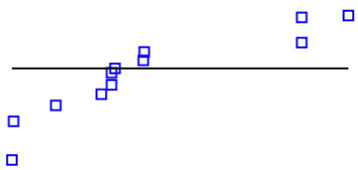
Let group1 = Sell prices of a prismarine blade, group2 = Material cost of a prismarine blade
X_1 = Sell price of a prismarine blade (coins), X_2 = Material cost of a prismarine blade (coins)
μ_1 = Mean sell price of a prismarine blade (coins), μ_2 = Mean material cost of a prismarine blade (coins)

$H_o: \mu_1 = \mu_2$ $H_a: \mu_1 > \mu_2$

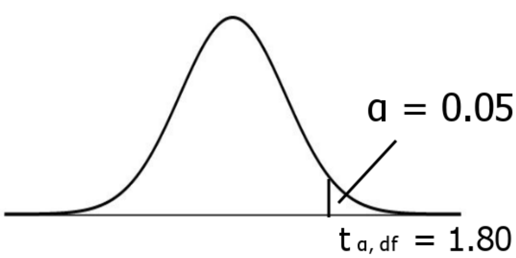
Requirements for a difference of means test (σ_1 and σ_2 unknown):

1. 2 independent SRS's: ✓ $n_1 = 12$ $n_2 = 6063$
   One price/cost from either group will not affect any price/cost from either group
2. σ is not known, but S_x is: ✓ $S_1 = 11{,}058.618$ coins $S_2 = 75.379$ coins
3. Group1 is normally distributed and $n_2 > 30$: ✓

Quantile plot of sell prices $n_2 = 6063 > 30$



Rejection Critieria:
$\alpha = 0.05$ df = 11



Reject H_o if $t > 1.80$

Test Statistic:

$$t = \frac{(\bar{x}_1 - \bar{x}_2) - (\mu_1 - \mu_2)}{\sqrt{\frac{S_1{}^2}{N_1} + \frac{S_2{}^2}{N_2}}}$$

$t = 4.12$
p-value = 0.0008

Reject H_o since $4.12 > 1.80$

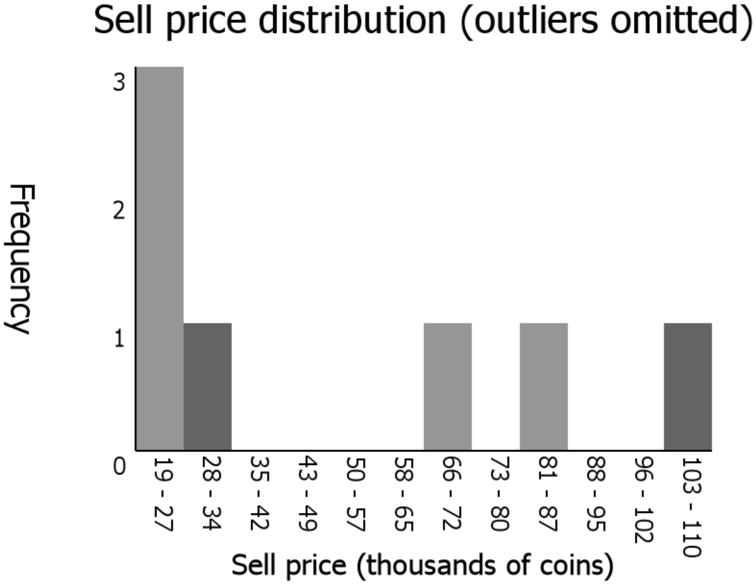
Inputs:
$\bar{x}_1 = 13{,}466.5$ (coins)
$\bar{x}_2 = 309.3051$ (coins)
$S_1 = 11{,}058.618$ (coins)
$S_2 = 75.379$ (coins)
$n_1 = 12$
$n_2 = 6{,}063$

There is significant evidence at the α=0.05 level of significance to support the claim that the mean selling price of a prismarine blade is greater than the mean cost of the materials required to make it.

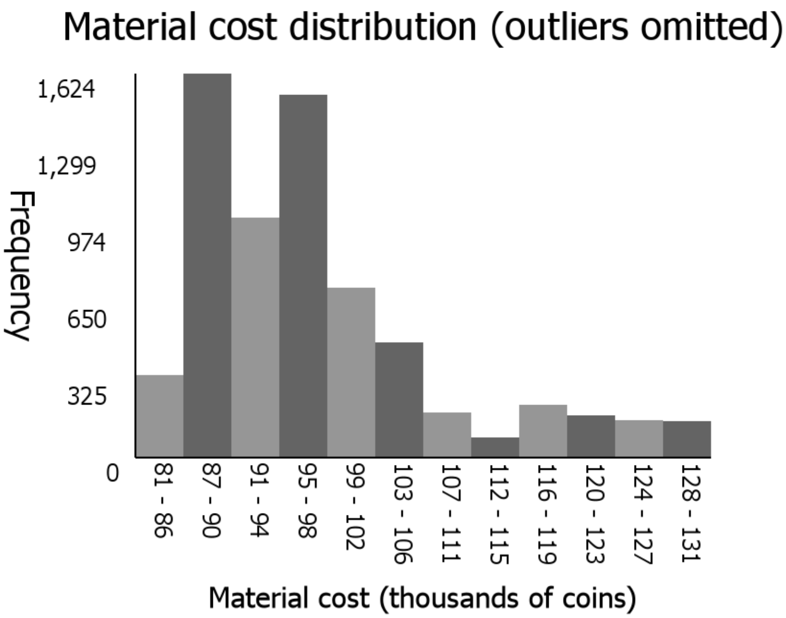
Since we rejected H_o, it suggests that on average people earned more coins from selling this item than it would have cost them to buy the materials.

Implication: the test suggests that on average we could make a profit from flipping this item.

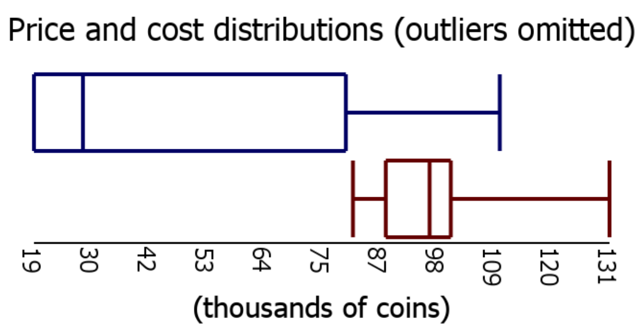
Selling prices and material costs of a golem armor chestplate

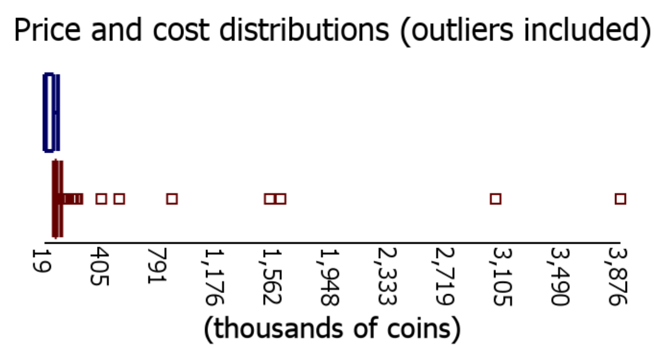


The distribution is centered around 28,750 coins (median). It has a moderate variability (IQR of 60,800 coins) and is skewed right. There are large gaps between 34,333 - 64,600 coins, 72,167 - 79,733 coins, and 87,300 - 102,433 coins. There are 0 outliers on the low end and 0 outliers on the high end.



The distribution is centered around 96,320 coins (median). It has a low variability (IQR of 12,673 coins) and is mostly symmetrical. There are no large gaps in the distribution. There are 0 outliers on the low end and 771 outliers on the high end, the highest being 3,876,063 coins.





Key:

Sell Price

Material Cost

5 number summeries (thousands of coins):

min: 19, q1: 19, median: 29, q3: 80, max: 110

min: 81, q1: 88, median: 96, q3: 100, max: 131

Statistical test comparing the selling prices and material costs of a golem armor chestplate

Let group1 = Sell prices of a golem armor chestplate, group2 = Material cost of a golem armor chestplate

X_1 = Sell price of a golem armor chestplate (coins), X_2 = Material cost of a golem armor chestplate (coins)

μ_1 = Mean sell price of a golem armor chestplate (coins),

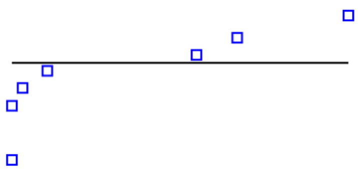
μ_2 = Mean material cost of a golem armor chestplate (coins)

H_o: $\mu_1 = \mu_2$ H_a: $\mu_1 > \mu_2$

Requirements for a difference of means test (σ_1 and σ_2 unknown):

1. 2 independent SRS's: ✓ $n_1 = 7$ $n_2 = 6717$
   One price/cost from either group will not affect any price/cost from either group
2. σ is not known, but S_x is: ✓ S_1 = 36,489.5449 coins S_2 = 10,895.5366 coins
3. Group1 is normally distributed and $n_2 > 30$: ✓

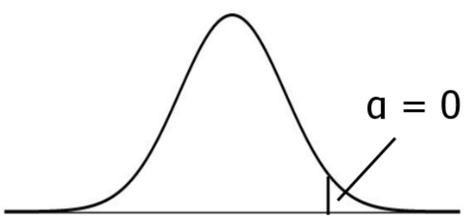
Quantile plot of sell prices



$n_2 = 6717 > 30$

Rejection Critieria:

$\alpha = 0.05$ df = 6



Reject H_o if $t > 1.94$

Test Statistic:

$$t = \frac{(\bar{x}_1 - \bar{x}_2) - (\mu_1 - \mu_2)}{\sqrt{\frac{S_1^2}{N_1} + \frac{S_2^2}{N_2}}}$$

$t = -3.44$
p-value = 0.9931

Inputs:

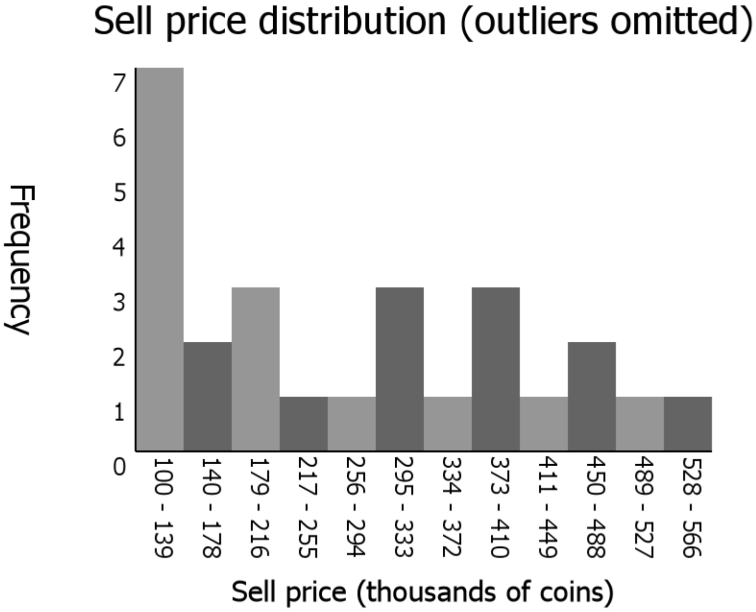
$\bar{x}_1$ = 49,747.1429 (coins)
$\bar{x}_2$ = 97,166.5828 (coins)
S_1 = 36,489.5449 (coins)
S_2 = 10,895.5366 (coins)
$n_1 = 7$
n_2 = 6,717

Fail to reject H_o since $-3.44 < 1.94$

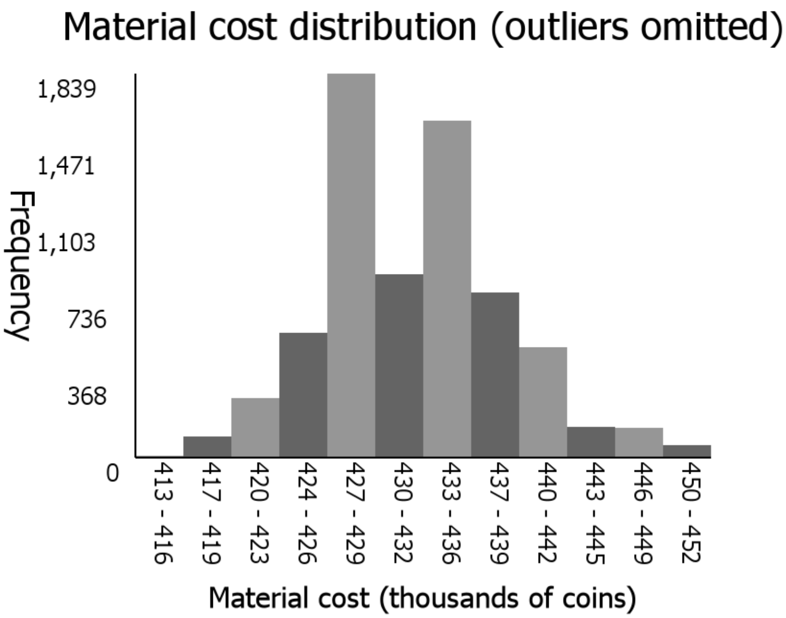
There is not significant evidence at the α=0.05 level of significance to support the claim that the mean selling price of a golem armor chestplate is greater than the mean cost of the materials required to make it.

Since we failed to reject H_o, it suggests that on average people did not earn more coins from selling this item than it would have cost them to buy the materials.

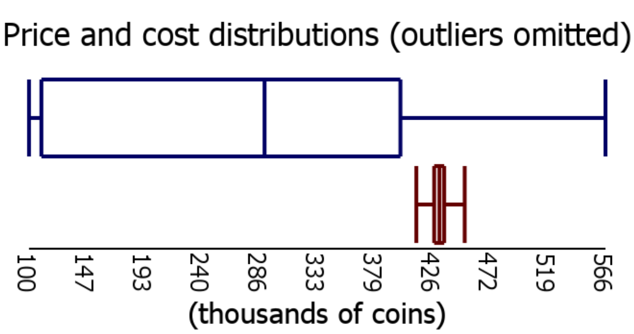
Selling prices and material costs of a farmer boots

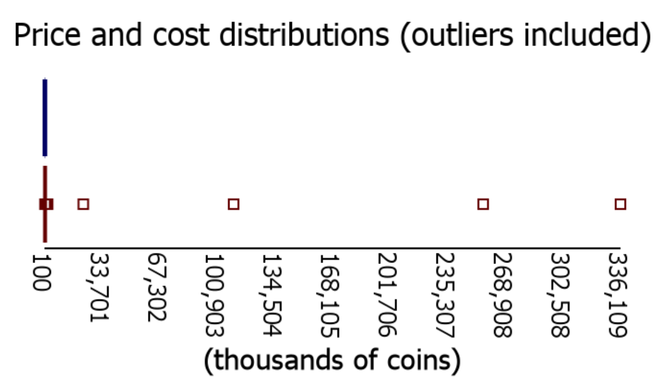


The distribution is centered around 290,253 coins (median). It has a low variability (IQR of 290,000 coins) and is skewed left. There are no large gaps in the distribution. There are 0 outliers on the low end and 0 outliers on the high end.



The distribution is centered around 431,525 coins (median). It has a low variability (IQR of 8,090 coins) and is mostly symmetrical. There are no large gaps in the distribution. There are 7 outliers on the low end, the lowest being 401,760 coins and 488 outliers on the high end, the highest being 336,109,414 coins.





Key:

Sell Price

Material Cost

5 number summeries (thousands of coins):

min: 100, q1: 110, median: 290, q3: 400, max: 566

min: 413, q1: 427, median: 432, q3: 435, max: 452

Statistical test comparing the selling prices and material costs of a farmer boots

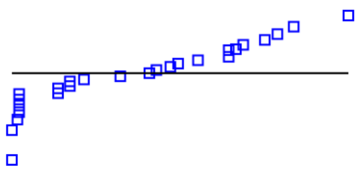
Let group1 = Sell prices of a farmer boots, group2 = Material cost of a farmer boots
X_1 = Sell price of a farmer boots (coins), X_2 = Material cost of a farmer boots (coins)
μ_1 = Mean sell price of a farmer boots (coins), μ_2 = Mean material cost of a farmer boots (coins)

H_o: $\mu_1 = \mu_2$ H_a: $\mu_1 > \mu_2$

Requirements for a difference of means test (σ_1 and σ_2 unknown):

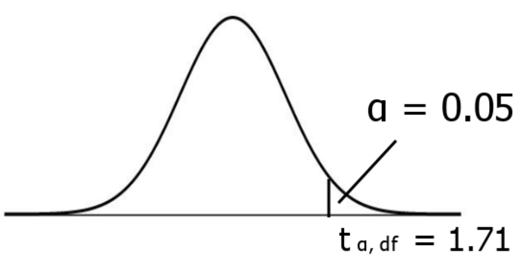
1. 2 independent SRS's: ✓ $n_1 = 26$ $n_2 = 6993$
   One price/cost from either group will not affect any price/cost from either group
2. σ is not known, but S_x is: ✓ S_1 = 145,398.4916 coins S_2 = 6,220.487 coins
3. Group1 is normally distributed and $n_2 > 30$: ✓

Quantile plot of sell prices



$n_2 = 6993 > 30$

Rejection Critieria:
$\alpha = 0.05$ df = 25



Reject H_o if $t > 1.71$

Test Statistic:

$$t = \frac{(\bar{x}_1 - \bar{x}_2) - (\mu_1 - \mu_2)}{\sqrt{\frac{S_1^2}{N_1} + \frac{S_2^2}{N_2}}}$$

$t = -5.58$
p-value > 0.9999

Inputs:
$\bar{x}_1$ = 272,523.4231 (coins)
$\bar{x}_2$ = 431,762.3348 (coins)
S_1 = 145,398.4916 (coins)
S_2 = 6,220.487 (coins)
n_1 = 26
n_2 = 6,993

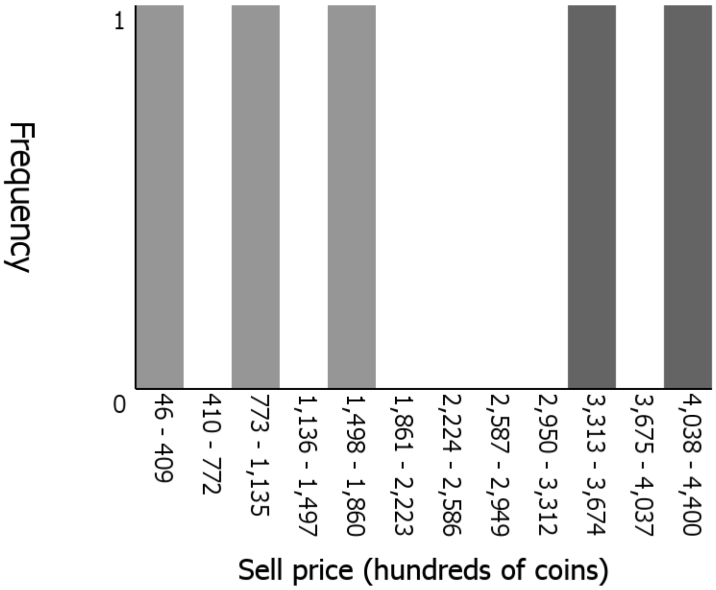
Fail to reject H_o since $-5.58 < 1.71$

There is not significant evidence at the α=0.05 level of significance to support the claim that the mean selling price of a farmer boots is greater than the mean cost of the materials required to make it.

Since we failed to reject H_o, it suggests that on average people did not earn more coins from selling this item than it would have cost them to buy the materials.

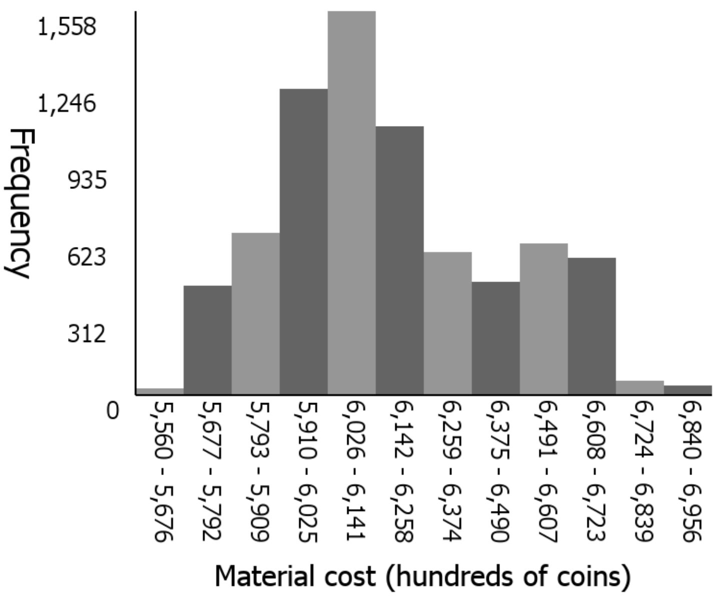
Selling prices and material costs of a crystal chestplate

Sell price distribution (outliers omitted)



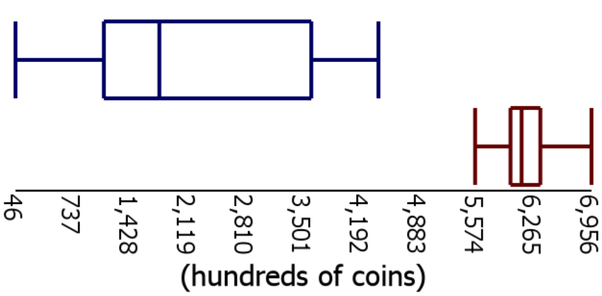
The distribution is centered around 177,156 coins (median). It has a low variability (IQR of 248,811 coins) and is skewed right. There are large gaps between 40,883 - 77,167 coins, 113,450 - 149,733 coins, 186,017 - 331,150 coins, and 367,433 - 403,717 coins. There are 0 outliers on the low end and 0 outliers on the high end.

Material cost distribution (outliers omitted)

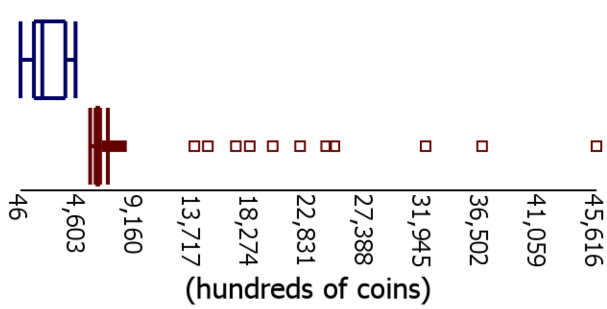


The distribution is centered around 611,698 coins (median). It has a low variability (IQR of 35,802 coins) and is mostly symmetrical. There are no large gaps in the distribution. There are 0 outliers on the low end and 153 outliers on the high end, the highest being 4,561,586 coins.

Price and cost distributions (outliers omitted)



Price and cost distributions (outliers included)



Key:

Sell Price

Material Cost

5 number summeries (hundreds of coins):

min: 46, q1: 1,106, median: 1,772, q3: 3,594, max: 4,400

min: 5,560, q1: 5,984, median: 6,117, q3: 6,342, max: 6,956

Statistical test comparing the selling prices and material costs of a crystal chestplate

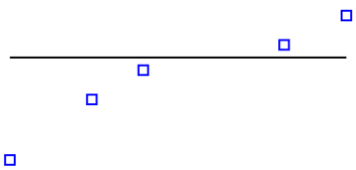
Let group1 = Sell prices of a crystal chestplate, group2 = Material cost of a crystal chestplate
X_1 = Sell price of a crystal chestplate (coins), X_2 = Material cost of a crystal chestplate (coins)
μ_1 = Mean sell price of a crystal chestplate (coins), μ_2 = Mean material cost of a crystal chestplate (coins)

H_o: $\mu_1 = \mu_2$ H_a: $\mu_1 > \mu_2$

Requirements for a difference of means test (σ_1 and σ_2 unknown):

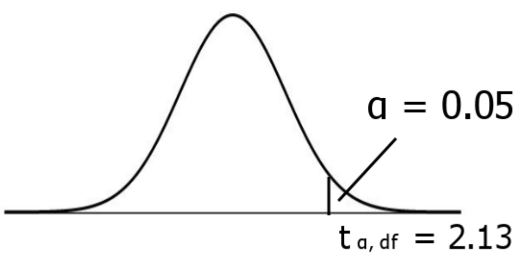
1. 2 independent SRS's: ✓ $n_1 = 5$ $n_2 = 7335$
   One price/cost from either group will not affect any price/cost from either group
2. σ is not known, but S_x is: ✓ S_1 = 178,902.719 coins S_2 = 27,224.5492 coins
3. Group1 is normally distributed and $n_2 > 30$: ✓

Quantile plot of sell prices



$n_2 = 7335 > 30$

Rejection Critieria:
$\alpha = 0.05$ df = 4



Reject H_o if $t > 2.13$

Test Statistic:

$$t = \frac{(\bar{x}_1 - \bar{x}_2) - (\mu_1 - \mu_2)}{\sqrt{\frac{S_1^2}{N_1} + \frac{S_2^2}{N_2}}}$$

$t = -4.99$
p-value = 0.9962

Inputs:
$\bar{x}_1$ = 218,363.8 (coins)
$\bar{x}_2$ = 617,229.2582 (coins)
S_1 = 178,902.719 (coins)
S_2 = 27,224.5492 (coins)
$n_1 = 5$
n_2 = 7,335

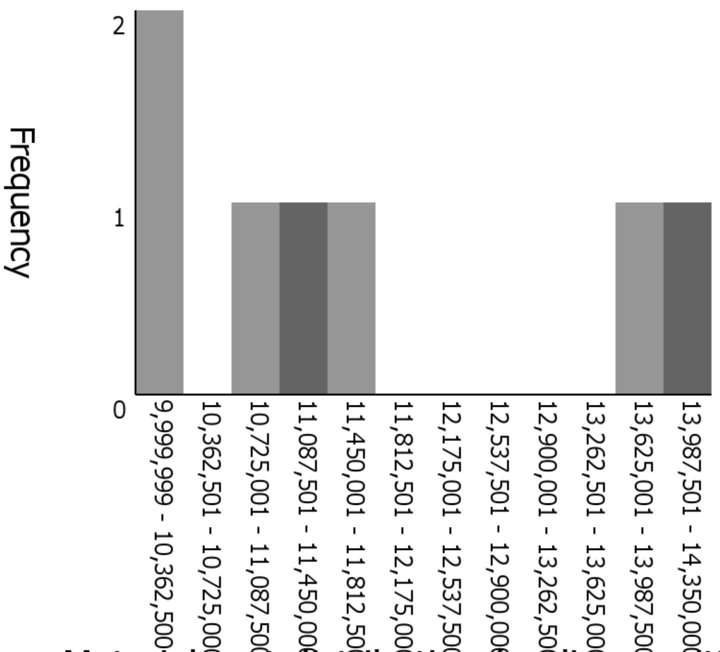
Fail to reject H_o since $-4.99 < 2.13$

There is not significant evidence at the α=0.05 level of significance to support the claim that the mean selling price of a crystal chestplate is greater than the mean cost of the materials required to make it.

Since we failed to reject H_o, it suggests that on average people did not earn more coins from selling this item than it would have cost them to buy the materials.

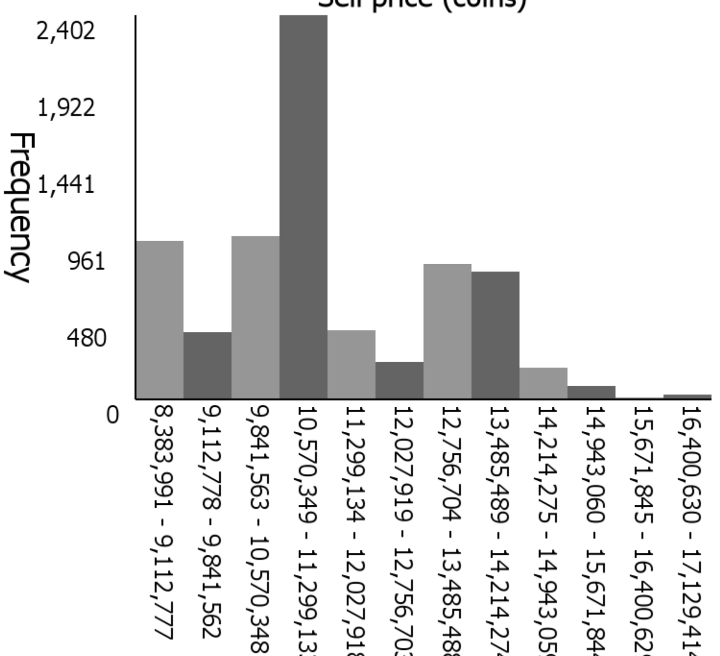
Selling prices and material costs of a frozen scythe

Sell price distribution (outliers omitted)



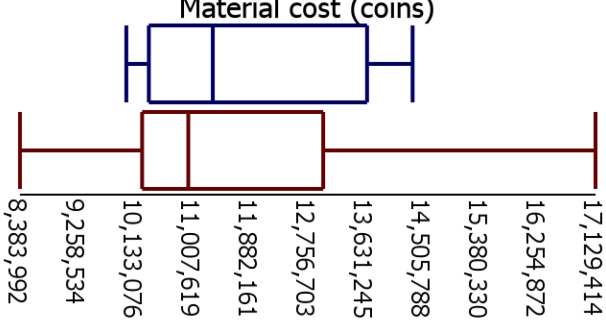
The distribution is centered around 11,314,082 coins (median). It has a low variability (IQR of 3,315,936 coins) and is mostly symmetrical. There are large gaps between 10,362,500 - 10,725,000 coins and 11,812,500 - 13,625,000 coins. There are 0 outliers on the low end and 0 outliers on the high end.

Material cost distribution (outliers omitted)

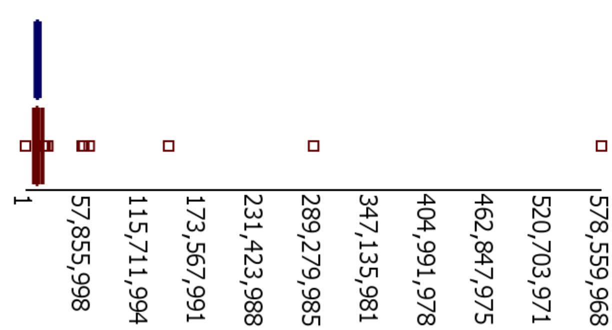


The distribution is centered around 10,941,760 coins (median). It has a low variability (IQR of 2,751,808 coins) and is mostly symmetrical. There are no large gaps in the distribution. There are 2 outliers on the low end, the lowest being 1 coins and 18 outliers on the high end, the highest being 578,559,968 coins.

Price and cost distributions (outliers omitted)



Price and cost distributions (outliers included)



Key:

Sell Price

Material Cost

5 number summeries (coins):

min: 10,000,000, q1: 10,342,189, median: 11,314,082, q3: 13,658,125, m

min: 8,383,992, q1: 10,240,179, median: 10,941,760, q3: 12,991,987, ma

Statistical test comparing the selling prices and material costs of a frozen scythe

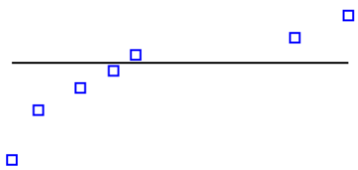
Let group1 = Sell prices of a frozen scythe, group2 = Material cost of a frozen scythe
X_1 = Sell price of a frozen scythe (coins), X_2 = Material cost of a frozen scythe (coins)
μ_1 = Mean sell price of a frozen scythe (coins), μ_2 = Mean material cost of a frozen scythe (coins)

$H_o: \mu_1 = \mu_2$ $\quad H_a: \mu_1 > \mu_2$

Requirements for a difference of means test (σ_1 and σ_2 unknown):

1. 2 independent SRS's: ✓ $n_1 = 7$ $n_2 = 7468$
   One price/cost from either group will not affect any price/cost from either group
2. σ is not known, but S_x is: ✓ S_1 = 1,653,515.611 coins S_2 = 1,781,977.1631 coins
3. Group1 is normally distributed and $n_2 > 30$: ✓

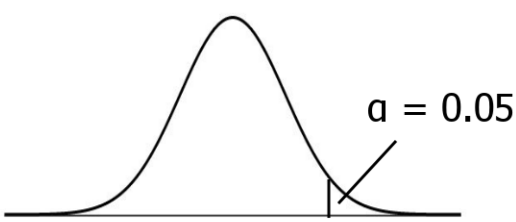
Quantile plot of sell prices



$n_2 = 7468 > 30$

Rejection Critieria:

$\alpha = 0.05$ df = 6



Reject H_o if $t > 1.94$

Test Statistic:

$$t = \frac{(\bar{x}_1 - \bar{x}_2) - (\mu_1 - \mu_2)}{\sqrt{\frac{S_1^2}{N_1} + \frac{S_2^2}{N_2}}}$$

$t = 0.71$
p-value = 0.2510

Inputs:

$\bar{x}_1$ = 11,735,627.4286 (coins)
$\bar{x}_2$ = 11,289,073.952 (coins)
S_1 = 1,653,515.611 (coins)
S_2 = 1,781,977.1631 (coins)
n_1 = 7
n_2 = 7,468

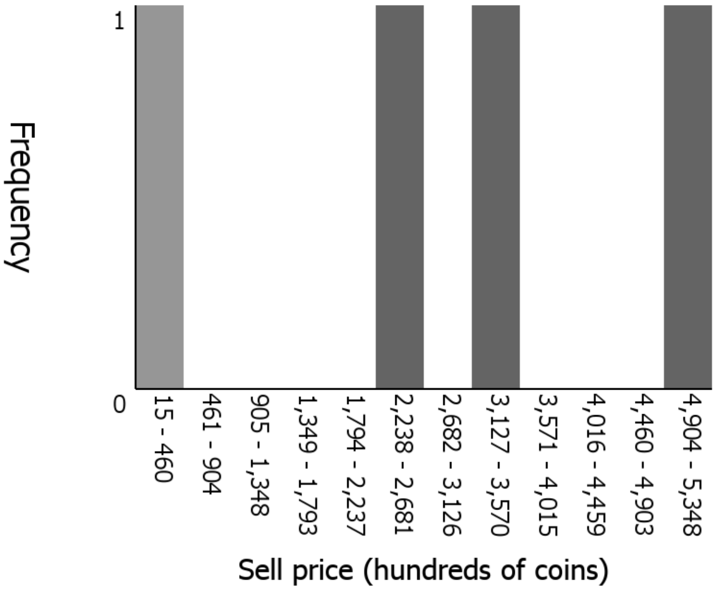
Fail to reject H_o since $0.71 < 1.94$

There is not significant evidence at the α=0.05 level of significance to support the claim that the mean selling price of a frozen scythe is greater than the mean cost of the materials required to make it.

Since we failed to reject H_o, it suggests that on average people did not earn more coins from selling this item than it would have cost them to buy the materials.

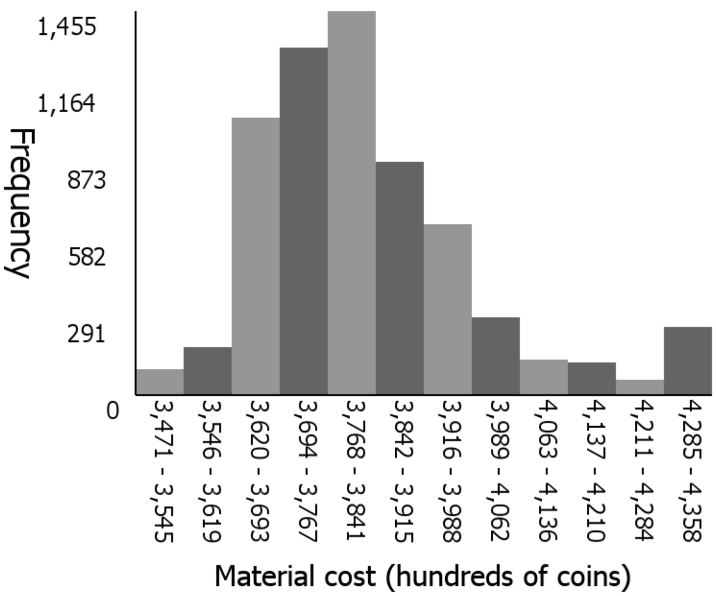
Selling prices and material costs of an amethyst power scroll

Sell price distribution (outliers omitted)



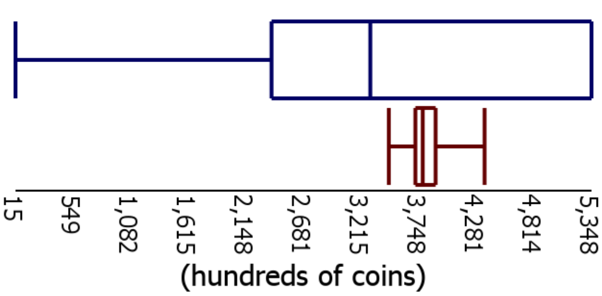
The distribution is centered around 330,000 coins (median). It has a low variability (IQR of 296,208 coins) and is skewed left. There are large gaps between 45,964 - 223,709 coins, 268,146 - 312,582 coins, and 357,018 - 490,327 coins. There are 0 outliers on the low end and 1 outliers on the high end, the highest being 1,000,000 coins.

Material cost distribution (outliers omitted)

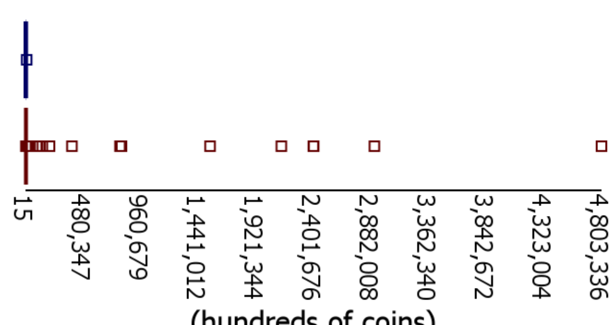


The distribution is centered around 378,542 coins (median). It has a low variability (IQR of 18,704 coins) and is mostly symmetrical. There are no large gaps in the distribution. There are 1 outliers on the low end, the lowest being 333,617 coins and 983 outliers on the high end, the highest being 480,333,632 coins.

Price and cost distributions (outliers omitted)



Price and cost distributions (outliers included)



Key:

Sell Price

Material Cost

5 number summeries (hundreds of coins):

min: 15, q1: 2,386, median: 3,300, q3: 5,348, max: 5,348

min: 3,471, q1: 3,717, median: 3,785, q3: 3,904, max: 4,358

Statistical test comparing the selling prices and material costs of an amethyst power scroll

Let group1 = Sell prices of an amethyst power scroll, group2 = Material cost of an amethyst power scroll

X_1 = Sell price of an amethyst power scroll (coins), X_2 = Material cost of an amethyst power scroll (coins)

μ_1 = Mean sell price of an amethyst power scroll (coins),

μ_2 = Mean material cost of an amethyst power scroll (coins)

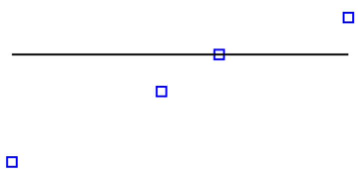
H_o: $\mu_1 = \mu_2$ H_a: $\mu_1 > \mu_2$

Requirements for a difference of means test (σ_1 and σ_2 unknown):

1. 2 independent SRS's: ✓ $n_1 = 4$ $n_2 = 6504$

   One price/cost from either group will not affect any price/cost from either group
2. σ is not known, but S_x is: ✓ S_1 = 221,066.444 coins S_2 = 17,251.1357 coins
3. Group1 is normally distributed and $n_2 > 30$: ✓

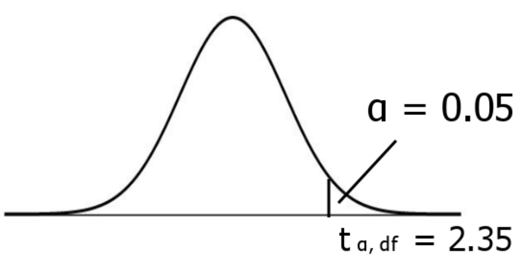
Quantile plot of sell prices



$n_2 = 6504 > 30$

Rejection Critieria:

$\alpha = 0.05$ df = 3



Reject H_o if $t > 2.35$

Test Statistic:

$$t = \frac{(\bar{x}_1 - \bar{x}_2) - (\mu_1 - \mu_2)}{\sqrt{\frac{S_1^2}{N_1} + \frac{S_2^2}{N_2}}}$$

$t = -0.96$

p-value = 0.7967

Inputs:

$\bar{x}_1$ = 276,211.5 (coins)

$\bar{x}_2$ = 382,633.5318 (coins)

S_1 = 221,066.444 (coins)

S_2 = 17,251.1357 (coins)

$n_1 = 4$

n_2 = 6,504

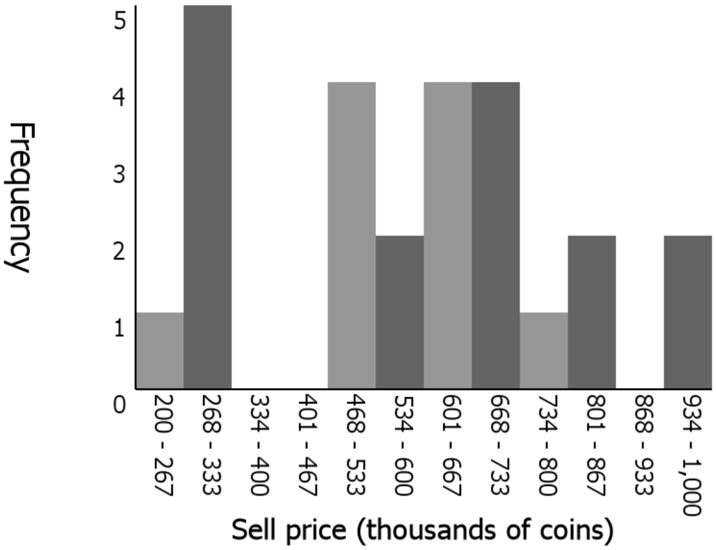
Fail to reject H_o since $-0.96 < 2.35$

There is not significant evidence at the α=0.05 level of significance to support the claim that the mean selling price of an amethyst power scroll is greater than the mean cost of the materials required to make it.

Since we failed to reject H_o, it suggests that on average people did not earn more coins from selling this item than it would have cost them to buy the materials.

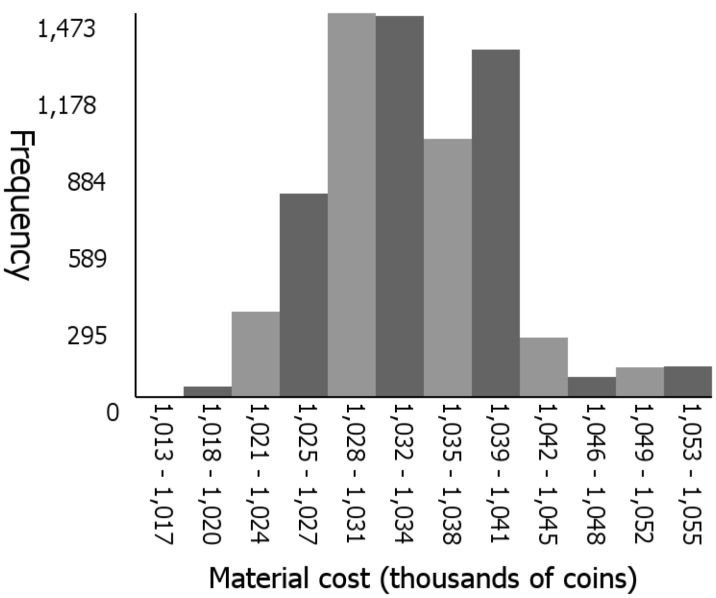
Selling prices and material costs of a melon boots

Sell price distribution (outliers omitted)



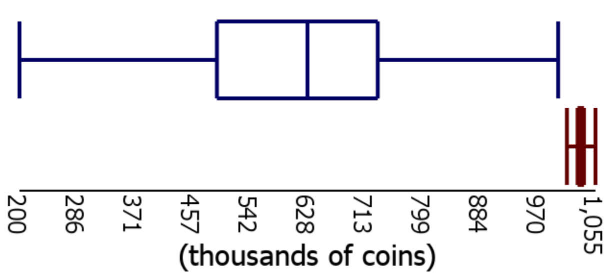
The distribution is centered around 627,685 coins (median). It has a low variability (IQR of 238,854 coins) and is skewed left. There are large gaps between 333,333 - 466,667 coins and 866,667 - 933,333 coins. There are 1 outliers on the low end, the lowest being 57,500 coins and 2 outliers on the high end, the highest being 5,000,000 coins.

Material cost distribution (outliers omitted)

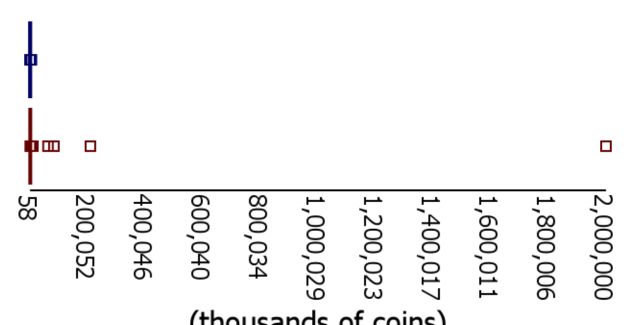


The distribution is centered around 1,032,876 coins (median). It has a low variability (IQR of 9,511 coins) and is mostly symmetrical. There are no large gaps in the distribution. There are 6 outliers on the low end, the lowest being 997,892 coins and 545 outliers on the high end, the highest being 1,999,999,998 coins.

Price and cost distributions (outliers omitted)



Price and cost distributions (outliers included)



Key:

Sell Price

Material Cost

5 number summeries (thousands of coins):

min: 200, q1: 493, median: 628, q3: 732, max: 1,000

min: 1,013, q1: 1,029, median: 1,033, q3: 1,038, max: 1,055

Statistical test comparing the selling prices and material costs of a melon boots

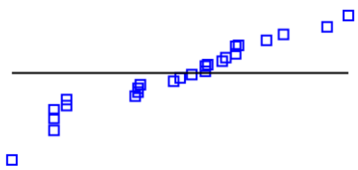
Let group1 = Sell prices of a melon boots, group2 = Material cost of a melon boots
X_1 = Sell price of a melon boots (coins), X_2 = Material cost of a melon boots (coins)
μ_1 = Mean sell price of a melon boots (coins), μ_2 = Mean material cost of a melon boots (coins)

H_o: $\mu_1 = \mu_2$ H_a: $\mu_1 > \mu_2$

Requirements for a difference of means test (σ_1 and σ_2 unknown):

1. 2 independent SRS's: ✓ $n_1 = 25$ $n_2 = 6937$
   One price/cost from either group will not affect any price/cost from either group
2. σ is not known, but S_x is: ✓ S_1 = 212,819.6194 coins S_2 = 6,815.6906 coins
3. Group1 is normally distributed and $n_2 > 30$: ✓

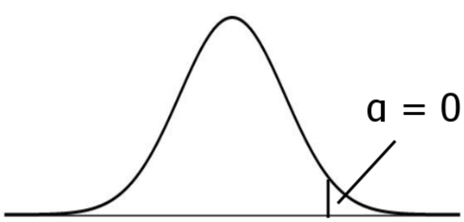
Quantile plot of sell prices



$n_2 = 6937 > 30$

Rejection Critieria:

$\alpha = 0.05$ df = 24



$\alpha = 0.05$

$t_{\alpha, df} = 1.71$

Reject H_o if $t > 1.71$

Test Statistic:

$$t = \frac{(\bar{X}_1 - \bar{X}_2) - (\mu_1 - \mu_2)}{\sqrt{\frac{S_1^2}{N_1} + \frac{S_2^2}{N_2}}}$$

$t = -10.40$
p-value > 0.9999

Inputs:

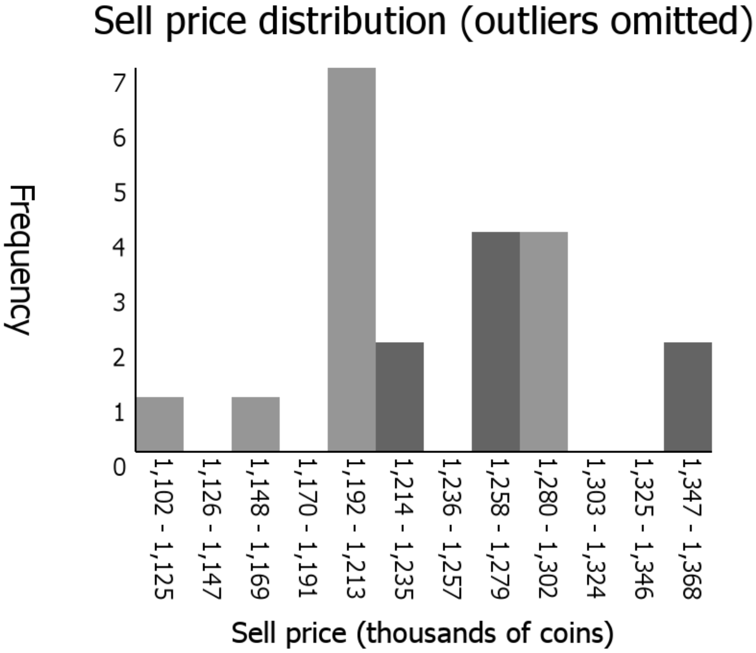
$\bar{x}_1$ = 590,731.76 (coins)
$\bar{x}_2$ = 1,033,343.6337 (coins)
S_1 = 212,819.6194 (coins)
S_2 = 6,815.6906 (coins)
n_1 = 25
n_2 = 6,937

Fail to reject H_o since $-10.40 < 1.71$

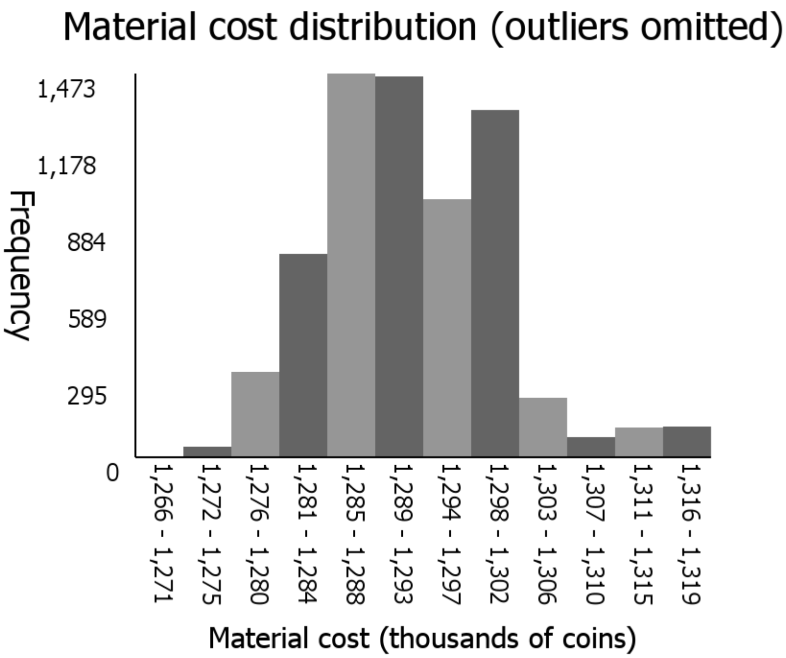
There is not significant evidence at the $\alpha=0.05$ level of significance to support the claim that the mean selling price of a melon boots is greater than the mean cost of the materials required to make it.

Since we failed to reject H_o, it suggests that on average people did not earn more coins from selling this item than it would have cost them to buy the materials.

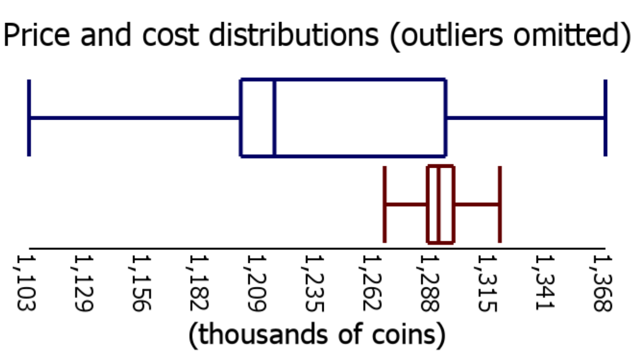
Selling prices and material costs of a melon helmet

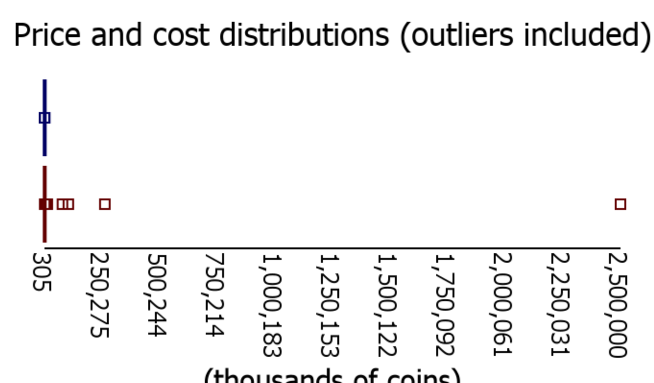


The distribution is centered around 1,215,506 coins (median). It has a low variability (IQR of 94,271 coins) and is mostly symmetrical. There are large gaps between 1,124,618 - 1,146,736 coins, 1,168,853 - 1,190,971 coins, 1,235,207 - 1,257,324 coins, and 1,301,560 - 1,345,795 coins. There are 2 outliers on the low end, the lowest being 305,305 coins and 1 outliers on the high end, the highest being 1,499,999 coins.



The distribution is centered around 1,291,095 coins (median). It has a low variability (IQR of 11,888 coins) and is mostly symmetrical. There are no large gaps in the distribution. There are 6 outliers on the low end, the lowest being 1,247,365 coins and 545 outliers on the high end, the highest being 2,499,999,998 coins.





Key:

Sell Price

Material Cost

5 number summeries (thousands of coins):

min: 1,103, q1: 1,200, median: 1,216, q3: 1,294, max: 1,368

min: 1,266, q1: 1,286, median: 1,291, q3: 1,298, max: 1,319

Statistical test comparing the selling prices and material costs of a melon helmet

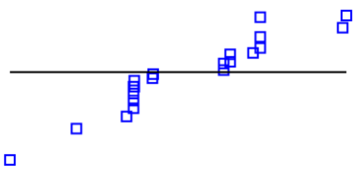
Let group1 = Sell prices of a melon helmet, group2 = Material cost of a melon helmet
X_1 = Sell price of a melon helmet (coins), X_2 = Material cost of a melon helmet (coins)
μ_1 = Mean sell price of a melon helmet (coins), μ_2 = Mean material cost of a melon helmet (coins)

$H_o: \mu_1 = \mu_2 \quad H_a: \mu_1 > \mu_2$

Requirements for a difference of means test (σ_1 and σ_2 unknown):

1. 2 independent SRS's: ✓ $n_1 = 21$ $n_2 = 6937$
   One price/cost from either group will not affect any price/cost from either group
2. σ is not known, but S_x is: ✓ S_1 = 66,718.5735 coins S_2 = 8,519.6125 coins
3. Group1 is normally distributed and $n_2 > 30$: ✓

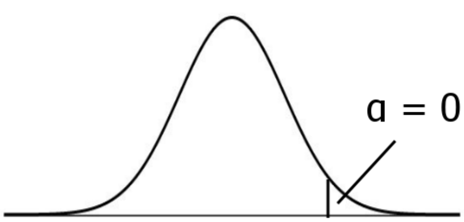
Quantile plot of sell prices



$n_2 = 6937 > 30$

Rejection Critieria:

$\alpha = 0.05$ df = 20



Reject H_o if $t > 1.72$

Test Statistic:

$$t = \frac{(\bar{x}_1 - \bar{x}_2) - (\mu_1 - \mu_2)}{\sqrt{\frac{S_1^2}{N_1} + \frac{S_2^2}{N_2}}}$$

Inputs:

$\bar{x}_1$ = 1,243,133.381 (coins)
$\bar{x}_2$ = 1,291,679.5515 (coins)
S_1 = 66,718.5735 (coins)
S_2 = 8,519.6125 (coins)
$n_1 = 21$
n_2 = 6,937

$t = -3.33$
p-value = 0.9983

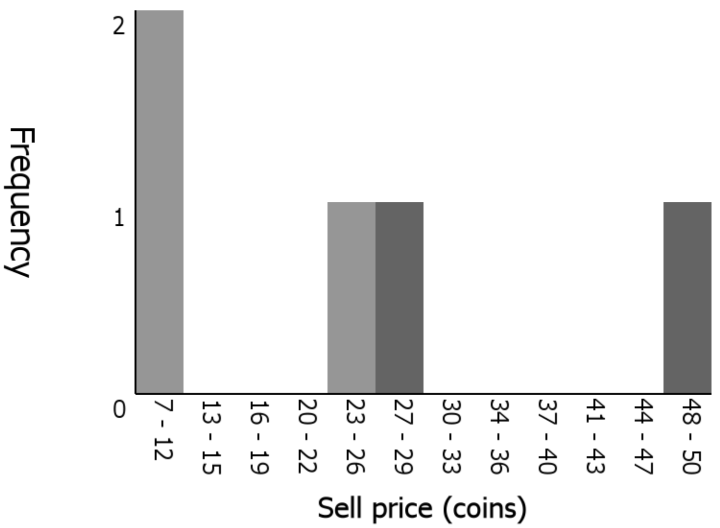
Fail to reject H_o since $-3.33 < 1.72$

There is not significant evidence at the α=0.05 level of significance to support the claim that the mean selling price of a melon helmet is greater than the mean cost of the materials required to make it.

Since we failed to reject H_o, it suggests that on average people did not earn more coins from selling this item than it would have cost them to buy the materials.

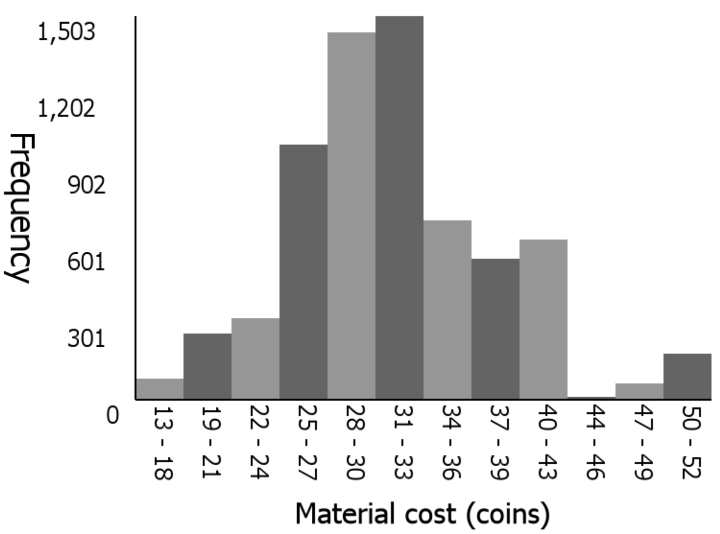
Selling prices and material costs of a skeleton hat

Sell price distribution (outliers omitted)



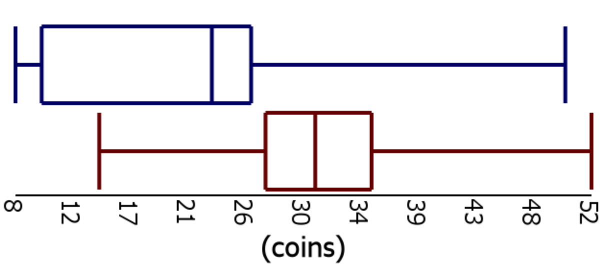
The distribution is centered around 23 coins (median). It has a low variability (IQR of 16 coins) and is mostly symmetrical. There are large gaps between 12 - 22 coins and 29 - 47 coins. There are 0 outliers on the low end and 0 outliers on the high end.

Material cost distribution (outliers omitted)

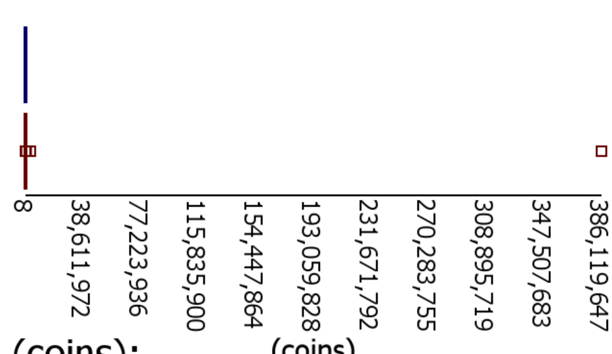


The distribution is centered around 31 coins (median). It has a low variability (IQR of 8 coins) and is mostly symmetrical. There are no large gaps in the distribution. There are 0 outliers on the low end and 750 outliers on the high end, the highest being 386,119,647 coins.

Price and cost distributions (outliers omitted)



Price and cost distributions (outliers included)



Key:

Sell Price

Material Cost

5 number summeries (coins):

min: 8, q1: 10, median: 23, q3: 26, max: 50

min: 14, q1: 27, median: 31, q3: 35, max: 52

Statistical test comparing the selling prices and material costs of a skeleton hat

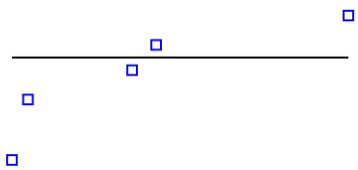
Let group1 = Sell prices of a skeleton hat, group2 = Material cost of a skeleton hat
X_1 = Sell price of a skeleton hat (coins), X_2 = Material cost of a skeleton hat (coins)
μ_1 = Mean sell price of a skeleton hat (coins), μ_2 = Mean material cost of a skeleton hat (coins)

H_o: $\mu_1 = \mu_2$ H_a: $\mu_1 > \mu_2$

Requirements for a difference of means test (σ_1 and σ_2 unknown):

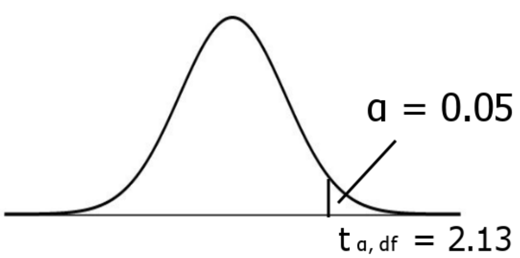
1. 2 independent SRS's: ✓ $n_1 = 5$ $n_2 = 6738$
   One price/cost from either group will not affect any price/cost from either group
2. σ is not known, but S_x is: ✓ $S_1 = 16.8167$ coins $S_2 = 6.7663$ coins
3. Group1 is normally distributed and $n_2 > 30$: ✓

Quantile plot of sell prices $n_2 = 6738 > 30$



Rejection Critieria:

$\alpha = 0.05$ df = 4



Reject H_o if $t > 2.13$

Test Statistic:

$$t = \frac{(\bar{x}_1 - \bar{x}_2) - (\mu_1 - \mu_2)}{\sqrt{\frac{S_1^2}{N_1} + \frac{S_2^2}{N_2}}}$$

$t = -1.03$
p-value = 0.8202

Fail to reject H_o since $-1.03 < 2.13$

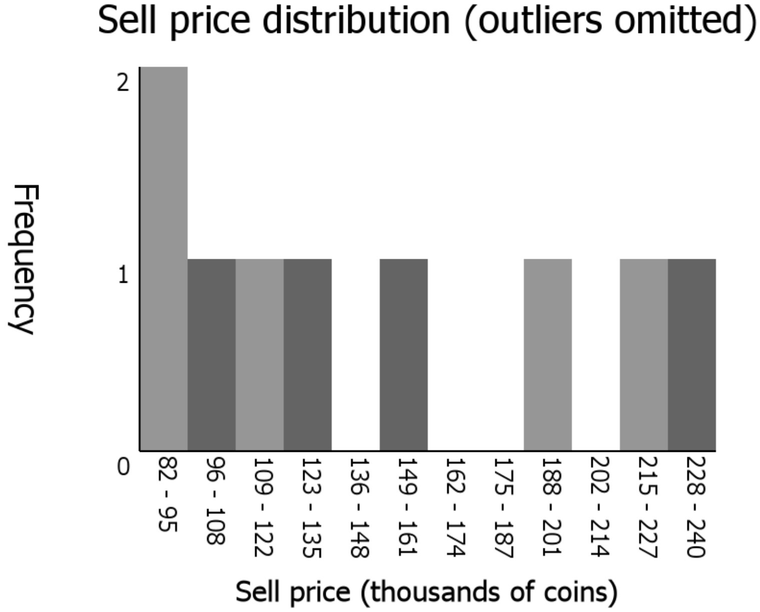
Inputs:

$\bar{x}_1 = 23.4$ (coins)
$\bar{x}_2 = 31.1749$ (coins)
$S_1 = 16.8167$ (coins)
$S_2 = 6.7663$ (coins)
$n_1 = 5$
$n_2 = 6{,}738$

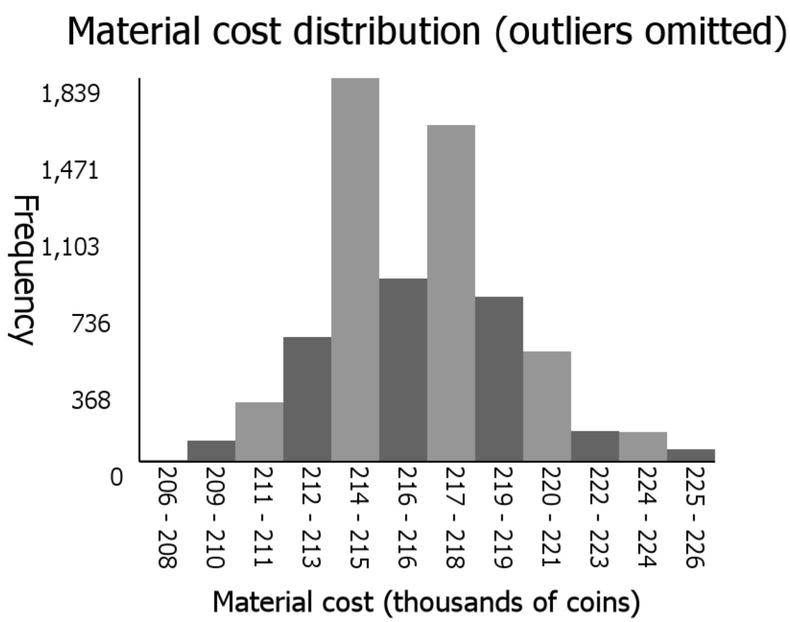
There is not significant evidence at the α=0.05 level of significance to support the claim that the mean selling price of a skeleton hat is greater than the mean cost of the materials required to make it.

Since we failed to reject H_o, it suggests that on average people did not earn more coins from selling this item than it would have cost them to buy the materials.

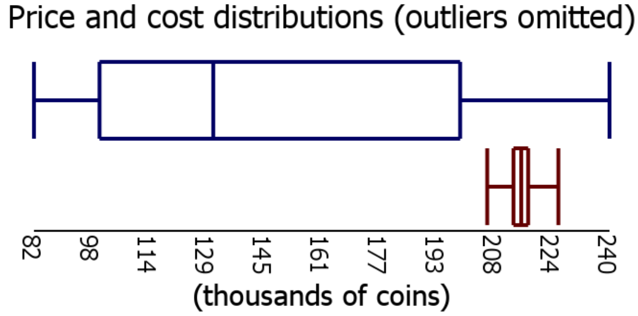
Selling prices and material costs of a lantern helmet

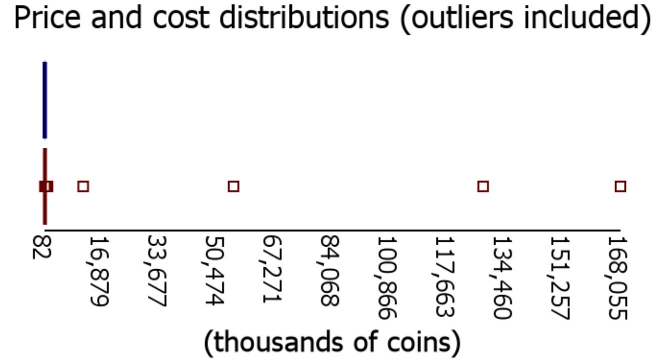


The distribution is centered around 131,219 coins (median). It has a low variability (IQR of 99,000 coins) and is skewed right. There are large gaps between 134,667 - 147,833 coins, 161,000 - 187,333 coins, and 200,500 - 213,667 coins. There are 0 outliers on the low end and 0 outliers on the high end.



The distribution is centered around 215,762 coins (median). It has a low variability (IQR of 4,045 coins) and is mostly symmetrical. There are no large gaps in the distribution. There are 7 outliers on the low end, the lowest being 200,880 coins and 488 outliers on the high end, the highest being 168,054,707 coins.





Key:

Sell Price

Material Cost

5 number summeries (thousands of coins):

min: 82, q1: 100, median: 131, q3: 199, max: 240

min: 206, q1: 214, median: 216, q3: 218, max: 226

Statistical test comparing the selling prices and material costs of a lantern helmet

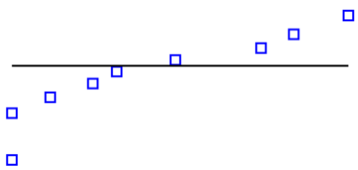
Let group1 = Sell prices of a lantern helmet, group2 = Material cost of a lantern helmet
X_1 = Sell price of a lantern helmet (coins), X_2 = Material cost of a lantern helmet (coins)
μ_1 = Mean sell price of a lantern helmet (coins), μ_2 = Mean material cost of a lantern helmet (coins)

H_o: $\mu_1 = \mu_2$ H_a: $\mu_1 > \mu_2$

Requirements for a difference of means test (σ_1 and σ_2 unknown):

1. 2 independent SRS's: ✓ $n_1 = 9$ $n_2 = 6993$
   One price/cost from either group will not affect any price/cost from either group
2. σ is not known, but S_x is: ✓ S_1 = 58,804.5705 coins S_2 = 3,110.2425 coins
3. Group1 is normally distributed and $n_2 > 30$: ✓

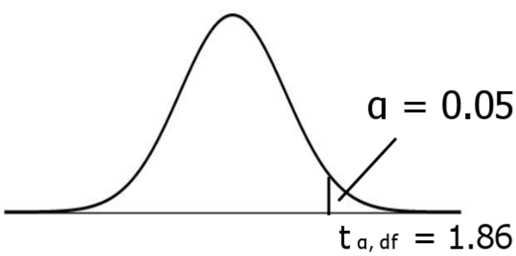
Quantile plot of sell prices



$n_2 = 6993 > 30$

Rejection Critieria:

$\alpha = 0.05$ df = 8



Reject H_o if $t > 1.86$

Test Statistic:

$$t = \frac{(\bar{x}_1 - \bar{x}_2) - (\mu_1 - \mu_2)}{\sqrt{\frac{S_1^2}{N_1} + \frac{S_2^2}{N_2}}}$$

$t = -3.49$
p-value = 0.9959

Inputs:

$\bar{x}_1$ = 147,483.6667 (coins)
$\bar{x}_2$ = 215,881.1684 (coins)
S_1 = 58,804.5705 (coins)
S_2 = 3,110.2425 (coins)
$n_1 = 9$
n_2 = 6,993

Fail to reject H_o since $-3.49 < 1.86$

There is not significant evidence at the α=0.05 level of significance to support the claim that the mean selling price of a lantern helmet is greater than the mean cost of the materials required to make it.

Since we failed to reject H_o, it suggests that on average people did not earn more coins from selling this item than it would have cost them to buy the materials.