



The Market For Luxury Watches

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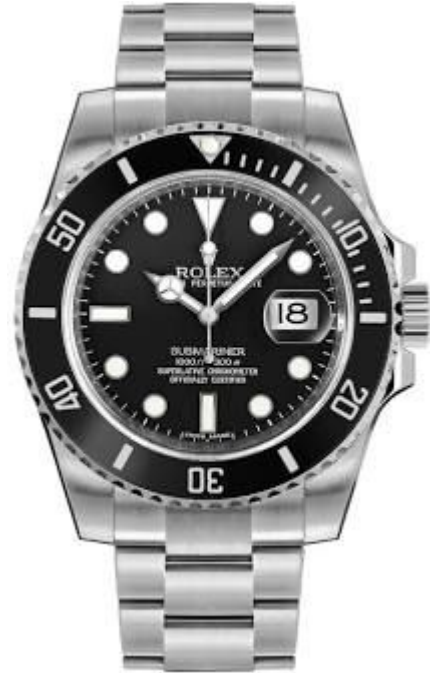
Watches Are Yet Another Easy Way Rich People Make Their Money Into More Money

The high-end watch market is a strong investment vehicle for wealthy people.



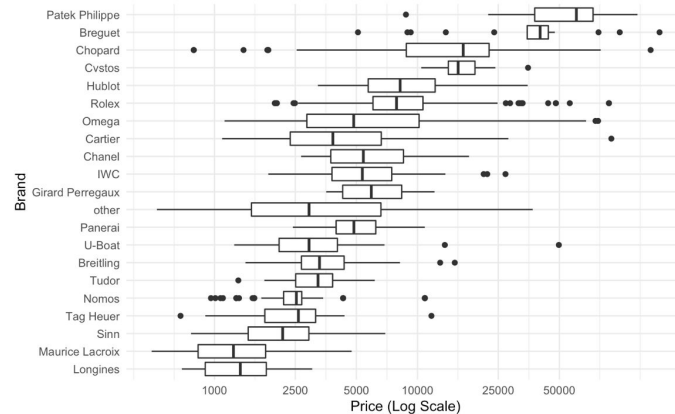
Primary Objectives

1. Generate a dataset of luxury watch features and prices using web scraping
2. Determine relevant factors in pricing of luxury watches
3. Evaluate whether vintage watches represent a “strong investment vehicle”
4. Create an RShiny app to visualize and share data with the public



Data

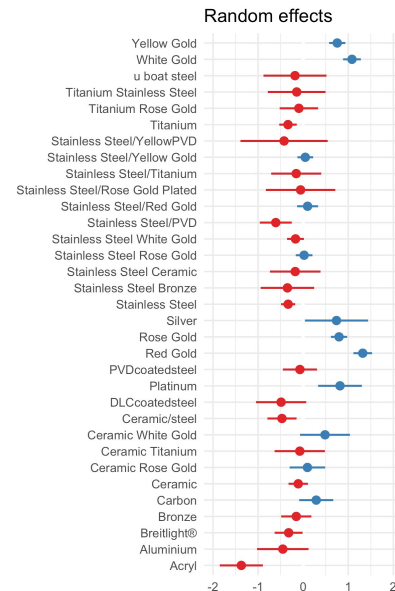
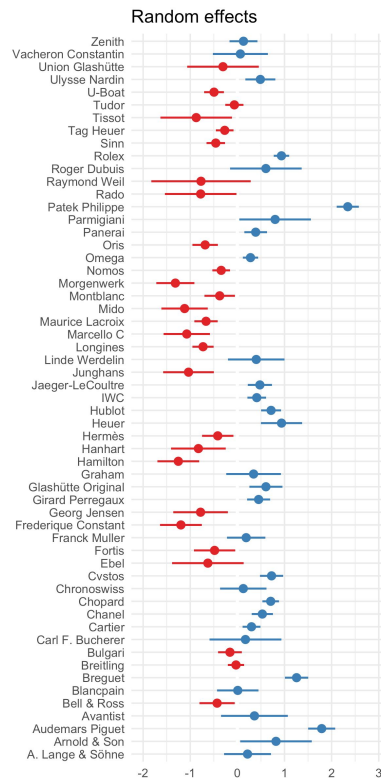
- ~2000 luxury watches scraped from CHRONEXT, a luxury watch exchange
- Prices, size, material, gender, year, condition, brand, model name
- Price significantly right skewed, 50+ brands and 25+ materials



Model

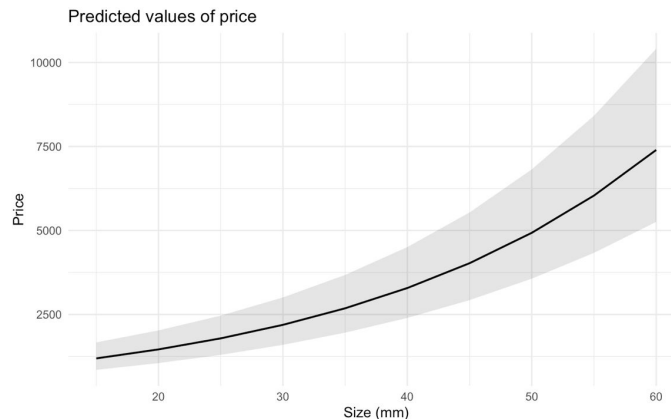
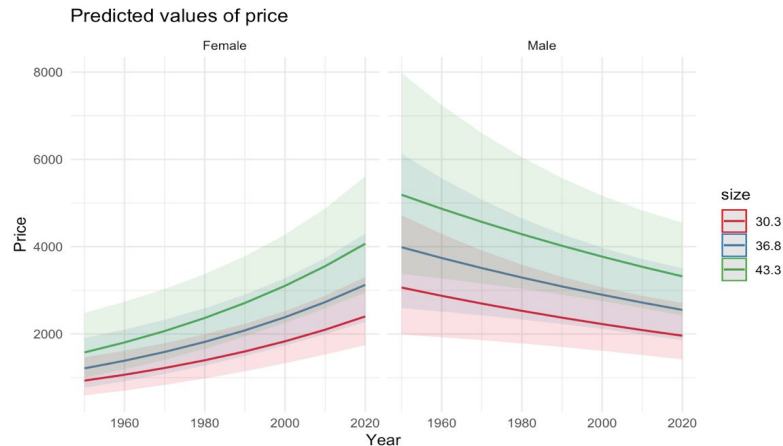
- **Mixed effects model** on log-transformed price
- Random effects: brand, material
- Fixed effects: year, gender, condition, size
- **Interaction effects:** year x gender
- Selected best model by **AIC**

Model	AIC
Base: RE for Brand and Material	2548
Gender x Size	2556
Gender x Year	2483
Both Interactions	2486
FE for Brand — Gender x Year	2520
FE for Material — gender x Year	2551



Conclusions

- All variables highly significant in predicting price
- Most effects intuitive:
 - Larger, better condition more expensive
- Brand and Material
 - **Most Expensive:** Patek Phillipe, Audemars Piguet, Breguet; Gold, Platinum, Silver
 - **Cheapest:** Morganwerk, Hamilton, Frederique Constant; Acrylic, Aluminum, Bronze
- Year effect most interesting:
 - **Women's watches depreciate** over time: a watch one year older is expected to be 1.3% less valuable
 - **Men's appreciate:** 0.6% per year
 - No difference in appreciation between most high-end brands and other brands



Luxury watches as an asset class?

- **Negative return profile**
 - Women's lose value over time
 - Men's appreciate at a rate below inflation
- **Depreciation through usage**
 - New to Very Good Condition -> 22% loss of value
- **Illiquid market**
 - Using eBay and Amazon APIs, found only a handful (<15) of relevant transactions in last 3 months
 - Jewelry stores and luxury watch exchanges take a large cut
- **Consistent with economic theory**
 - If watches provided returns similar to a financial asset, they would attract more demand given their additional aesthetic benefit, driving up the price



R Shiny App



<https://jake-epstein.shinyapps.io/shiny/>

- **Visualize Luxury Watch Data:** Exploratory data analysis
- **Explore the Data:** data browser with search and filtering functionality, ability to download data
- **How much is your watch worth?** Prediction from our mixed effects model for price to value a particular watch based on input data. Also displays other watches with similar features

The Market For Luxury Watches

Visualize Luxury Watch Prices

Explore the Data

What is your Watch Worth?

Select a Variable:

Size

☒ Group Gender (if Applicable)

☐ Only Show Top Brands

☐ Only Show The Top Materials

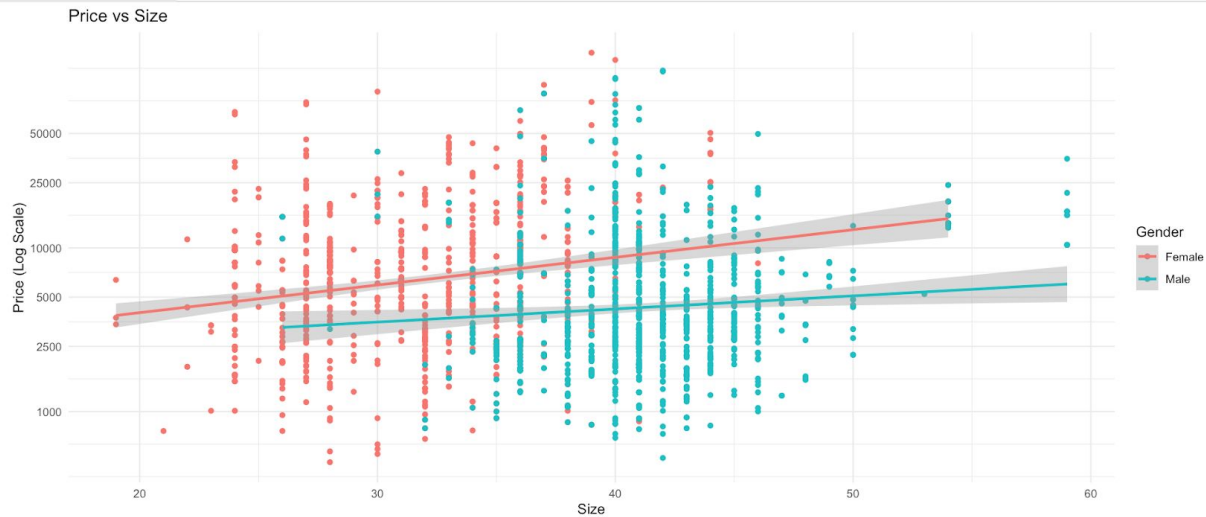
Minimum Price (\$000s)

0

Maximum Price (\$000s)

200

Generate Plot



The Market For Luxury Watches

Visualize Luxury Watch Prices

Explore the Data

What is your Watch Worth?

Select a Gender

Male

Select a Material

Rose Gold

Select a Brand

Any

Select a Condition

New

Year Range



Size Range



Minimum Price (\$000s)

0

Maximum Price (\$000s)

200

Find All Matches

Download This Data

We found 23 watches that fit your criteria, for an average price of \$24.1k!

Show 25 entries

Search:

Size	Material	Condition	Year	Brand	Title	Price	Gender
36	Rose Gold	New	2018	Cartier	Ballon Bleu	20020	Male
42	Rose Gold	New	2019	Chopard	Mille Miglia	14250	Male
44	Rose Gold	New	2019	Chopard	Mille Miglia	18150	Male
41	Rose Gold	New	2019	Chopard	Classic Racing Superfast	16570	Male
40	Rose Gold	New	2019	Patek Philippe	Nautilus Date Sweep Seconds	109230	Male
42	Rose Gold	New	2019	Chopard	Mille Miglia	15600	Male
26	Rose Gold	New	2019	Chopard	Chopard Classic	11390	Male
26	Rose Gold	New	2019	Chopard	Chopard Classic	15480	Male
33	Rose Gold	New	2019	Chopard	Chopard Classic	14270	Male
30	Rose Gold	New	2019	Chopard	Chopard Classic	15550	Male
33	Rose Gold	New	2019	Chopard	Chopard Classic	14840	Male
39	Rose Gold	New	2019	Bulgari	Bulgari Solotempo	8800	Male
46	Rose Gold	New	2016	IWC	Big Pilot Annual Calendar "Le Petit Prince"	21180	Male
36	Rose Gold	New	2016	Cartier	Ronde Louis	8270	Male
40	Rose Gold	New	2019	Rolex	Cosmograph Daytona	32550	Male
45	Rose Gold	New	2019	Chopard	Classic Racing Superfast Power Control	17520	Male

The Market For Luxury Watches

Visualize Luxury Watch Prices

Explore the Data

What is your Watch Worth?

Gender:

Male

Material:

Stainless Steel White Gold

Brand:

Rolex

Condition:

New

Size (mm):

40

Year:

2019

Find Out

Our model estimates your watch is worth \$10.08k

We found 57 watches very similar to yours, with an average price of \$12.2k:

Search:

Show 25 entries

Size	Material	Condition	Year	Brand	Title	Price	Gender	similarity_score
41	Stainless Steel White Gold	New	2018	Rolex	Datejust 41	12080	Male	6
36	Stainless Steel White Gold	New	2018	Rolex	Datejust 36	7940	Male	6
41	Stainless Steel White Gold	New	2019	Rolex	Datejust 41	10750	Male	6
41	Stainless Steel White Gold	New	2019	Rolex	Datejust 41	10750	Male	6
41	Stainless Steel White Gold	New	2019	Rolex	Datejust 41	10750	Male	6
41	Stainless Steel White Gold	New	2019	Rolex	Datejust 41	10970	Male	6
41	Stainless Steel White Gold	New	2019	Rolex	Datejust 41	10310	Male	6
41	Stainless Steel White Gold	New	2019	Rolex	Datejust 41	9660	Male	6
36	Stainless Steel White Gold	New	2018	Rolex	Datejust 36	8160	Male	6



Questions?

Appendix: Model Output

```
Linear mixed model fit by REML ['lmerMod']
Formula: log(price) ~ size + (1 | material) + (1 | brand) + condition + gender + year + year * gender
Data: watches

REML criterion at convergence: 2460.8

Scaled residuals:
    Min       1Q   Median       3Q      Max
-3.6808 -0.5892 -0.0641  0.5406  7.6135

Random effects:
Groups Name      Variance Std.Dev.
brand  (Intercept) 0.6306   0.7941
material (Intercept) 0.3460   0.5882
Residual              0.1906   0.4366
Number of obs: 1807, groups: brand, 57; material, 33

Fixed effects:
              Estimate Std. Error t value
(Intercept)   -20.731775   5.564475  -3.726
size           0.040545   0.002832  14.315
conditionGood  -0.064073   0.072374  -0.885
conditionNew    0.420174   0.084865   4.951
conditionVery Good 0.216896   0.073237   2.962
genderMale     40.036953   4.498051   8.901
year           0.013540   0.002788   4.857
genderMale:year -0.019921   0.002236  -8.910

Correlation of Fixed Effects:
              (Intr) size  cndtnG  cndtnN  cndtVG  gndrMl  year
size          -0.039
conditionGd    0.599 -0.020
conditionNw    0.778  0.021  0.820
cndtnVryGd    0.673 -0.022  0.793  0.890
genderMale    -0.512  0.088 -0.051 -0.070 -0.033
year          -0.999  0.021 -0.604 -0.784 -0.679  0.507
genderMl:yr    0.513 -0.092  0.051  0.070  0.033 -1.000 -0.507
fit warnings:
Some predictor variables are on very different scales: consider rescaling
```