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ABSTRACT

We quantify the value of social status using market prices for Delaware license plates. Delaware plates are numbered sequentially, are private property, and can be legally bequeathed or traded in a secondary market. License plates offer no direct economic benefit other than authorizing the operation of a motor vehicle. But they appear to be a source of social status. Not only do market prices suggest a preference for lower plate numbers, but there exist extreme price jumps that indicate that exclusive clubs exist whereby the number of digits on the plate convey implicit membership. The aggregate value of this market indicates that people purchase status as a significant portion of their consumption bundle. Finally, social status as an asset appears to be uncorrelated with aggregate economic and market conditions.

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The Value of Social Status

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We quantify the value of social status using market prices for Delaware license plates. Delaware plates are numbered sequentially, are private property, and can be legally bequeathed or traded in a secondary market. License plates offer no direct economic benefit other than authorizing the operation of a motor vehicle. But they appear to be a source of social status. Not only do market prices suggest a preference for lower plate numbers, but there exist extreme price jumps that indicate that exclusive clubs exist whereby the number of digits on the plate convey implicit membership. The aggregate value of this market indicates that people purchase status as a significant portion of their consumption bundle. Finally, social status as an asset appears to be uncorrelated with aggregate economic and market conditions.

Introduction

How much are people willing to pay for higher social status? Although social scientists have considered this question for centuries, status and its value are notoriously difficult to observe

directly and evaluate in isolation (1–4). Researchers in economics, psychology, and sociology have identified cases of social signaling through ownership of items like diamonds, jewelry, or fine art (5–9). But, all of these goods are also sources of significant economic utility and consumption value, thereby confounding the ability to isolate the value of pure status by itself.

The perception of social status that arises from conspicuous consumption reflects a good’s scarcity, exclusivity, and external observability (10). Expensive cars, handbags, jewelry, and club memberships can connote higher status in society. But, all of these assets are subject to personal tastes and practical uses. A Ferrari might be more fun to drive. The stitching on a designer handbag could reflect craftsmanship with aesthetic value. Diamonds are a part of cultural traditions that date back centuries. The utility for these scarce and conspicuous goods makes it difficult to disentangle their functional value from the pure value of the status they convey.

License plates issued by the state of Delaware offer a unique opportunity to evaluate the price that people are willing to pay for status. In Delaware, license plates are the property of the registrant, and are not permanently linked to any one particular vehicle. Plate owners have exclusive rights in perpetuity, even if they change cars. The plates are legally transferable: they have been bequeathed in wills and there is an active secondary market to trade license plates as assets.

A low number on an old-style tag signals that its owner is either wealthy, politically well-connected, or has old family ties in Delaware. And low-numbered tags are astonishingly valuable: in 2008, tag number 6 sold for \$675,000 at auction. Especially, for low-numbered tags, the license plate on a car is typically more valuable than the car itself. Figure 1 shows license plate 10 on the back of a late-model Ford Explorer.

Using prices from this market, we can calibrate the economic value of status because the license plates have no other inherent value. A plate number of 7, 93, or 87000 conveys a

motorist the same right to drive a car legally. The aesthetic value or manufacture of different license plates is virtually the same. The only difference between plates is the relative, linear order of one number compared to another.

Data

The State of Delaware began issuing license plates to motorists in 1909, and currently holds the distinction of having the longest-running plate design in the United States. Until 1941, motorists received new versions annually, with varying color schemes each year. However, in 1941, Delaware started issuing permanent, black and white tags made of porcelain and embossed with the letters DEL. They produced tags consecutively, starting with the number 1. Between 1941-1947, roughly 87,000 license plates were issued. In 1947, Delaware switched from porcelain to steel with DELAWARE embossed on the top and steel numbers spot-riveted on the plate. From 1947-1958, numbers 87,000 to 200,000 were issued. Then, in 1958 a blue and gold tag became standard-issue.

We collect a sample of secondary market transaction prices for Delaware license plates from three sources. The first is from major dealers who intermediate trade. We collected data from transaction records between 2014-2019 and supplemented this with “ask” prices that were posted for sale and time on the market. The second source was records from a historian who keeps track of sales of low digit plates (1 to 3,000) that occurred between 1998-2019.¹ The third was from manual searches to identify other sales and auctions that were reported in print media. The second and third sources include transaction prices and dates of sale.

Because we analyze the performance of Delaware license plates as an asset class, we also collect a time series of GDP and consumption for the U.S. and Delaware from the Bureau of Economic Analysis (BEA). Finally, we collect U.S. stock return data from the Center for

¹The historian is Jordan Irazabal. See TheDelaware3000.org.

Research in Securities Prices (CRSP) database.

Our dataset includes information regarding 2-, 3-, 4-, and 5-digit tags and covers three classifications of tags. The first are tags with no prefix (the original tags for non-commercial automobiles). The others are tags with the “PC” prefix (for station wagons and SUVs) and those with the “C” prefix (for commercial vehicles). The latter are valuable as well: Figure 2 shows an example of a funeral home company that advertises a low commercial tag number on its hearse, so that loved ones can go out in style.

There are 831 license plate transactions in our data. Details of the sample are presented in Table 1. Of the 831 transactions, 549 involve plates for standard personal automobiles (no prefix), 171 are for “C” tags, and 111 are for “PC” tags. There are thirty-six 2-digit and one hundred and forty 3-digit transactions. The most common transactions in our data are for 4-digit plates, of which we have 532 transactions. There are 123 transactions for the least-desirable 5-digit plates.

Table 1 presents summary statistics by number of digits and prefix type. We present information on the distribution of tag numbers for each group as well as information about the sales and ask prices. It is immediately clear that, across digit groups, lower digit tags sell for higher prices. The average price for 2-digit no-prefix tag is over \$180,000, while a 5-digit no-prefix tag sells for less than \$1,000 on average. We also observe that “C” and “PC” tags sell for substantially lower prices.

Results

Figure 3 plots the log sales price by the log tag number. The pattern that emerges is consistent with the presence of exclusive clubs where membership is restricted (e.g., two-digit club). Prices of the license plates are largely driven by the number of digits on the plate, not the number itself. There are discontinuous jumps in price at each threshold, but the slope within digit

bins is very small. The difference between the price of plate number 98 and 101 dwarfs the difference between 101 and 990. This is consistent with a strong status effect, where social rank is determined by how scarce the number of available plates are within each bin.

Table 2 presents results from a multivariate analysis that estimates the jumps across bins and the slope within, controlling for each type of prefix. Confirming the intuition from Figure 3, prices of Delaware license plates in the secondary market are largely driven by the number of digits on the plate. Based on the specification in column 1, a no-prefix 5-digit plate sells for, on average, \$870, all else equal. For these plates, we see discrete jumps in values as the number of digits on the plate drops. A 4-digit plate sells for almost \$11,000 more than a 5-digit plate, while a 2-digit plate sells on average for \$212,000. Single-digit tags are sufficiently valuable that they tend to sell at auction and we do not have enough data to reliably estimate the marginal increase in value for this set. Anecdotal evidence suggests that these sell for significantly more than even the 2-digit plates.²

In column 2 of Table 2, we conduct the same analysis on the larger set of ask price data. The point estimates remain consistent. The estimate ask price of 2-digit tags is slightly lower than the transaction price, but slightly higher for the other categories. The general pricing behavior over this large set of posted prices is quite similar to that of actual transactions.

In column 3 (column 4), we estimate the marginal effect the tag number on sales price (ask price) within each digit group. As noted above, if there were something inherently valuable about lower numbers, the tag number should co-vary with price within digit bins. This is not what we find. There is very little relation between price and the numerical value of the tag within each digit bin. For example, each higher number tag within the set of 2-digit tags is estimated to sell for \$100 less. Based on the average selling price of over \$200,000, this estimate is economically insignificant and is also statistically indistinguishable from zero. This is the

²<https://www.cbsnews.com/news/the-675000-license-plate/>

strongest evidence of social status through clubs. If there were any utility associated with lower numbers, we should see this reflected both across digit bins, but also within.

Within the subset of our data where we observe both ask price and transactions, we calculate the difference in these values. We then regress this difference on the digit categories and tag number. Not surprisingly, sales occur at lower values than posted ask prices. However, the magnitudes are economically meaningful. For example, 2-digit plates sell for \$62K less than the posted ask price.

Finally, one might wonder how the value of a status good like the Delaware plate changes in different economic settings. Using stock returns over the last fifteen years, we find very little correlation between changes in the prices of Delaware license plates and changes in stock prices in the market. Additionally, during the financial crisis of 2008, transaction prices of Delaware plates changed very little. We also see little evidence of a relation to changes in U.S. economic output per capita. These results are characterized in Figure 4. As such, the demand for social status appears to be persistent and uncorrelated with economic conditions.

Discussion

The aggregate value of the Delaware plates market is large. Using our estimates from column 1 of Table 2, we can compute that the total value of all no-prefix plates in our sample (from 10 to 99,999) is roughly \$227 million.³ This amount is arguably very large for some pieces of metal with a series of numbers on them. To put this magnitude in perspective, the state of Delaware's 2016 total expenditures by the government were just over ten billion dollars.

³Our analysis is conducted in nominal dollars. We do not observe the precise transaction or listing dates needed for deflating prices for 194 of our 831 transactions. Therefore any analysis based on real dollars results in a substantial drop in sample size. Given the relatively short time-series of the data and the generally low inflation over that time period, one would not expect a deflated analysis to yield meaningfully different results. Using real dollars for the sub-sample with transaction dates results in the same overall inference with slightly larger magnitude coefficients for each of the digit indicators.

The exclusivity of having high social status is large. The price of obtaining a two-digit tag is ten times (100 times) higher than a three-digit (four-digit) tag. Again, there is no other associated utility that comes from owning a different plate, besides being able to demonstrate conspicuous consumption and show other members of society that the owner is wealthy or well-connected.

But, the figure of \$227 million greatly understates the value of status to people in Delaware, or for U.S. citizens for that matter. As a fraction of Delaware GDP, the license plate market only represents 0.4%. However, as we alluded to above, there are a multitude of ways to demonstrate higher social status: club memberships, luxury purchases, and large-scale philanthropy. As such, we expect that in aggregate, Americans purchase status as a significant portion of their personal consumption bundle. The Delaware market simply allows us to document and calibrate cleanly how much people value their relative position in society.

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Figure 1: Example of a Low-Digit Plate

Source: <http://thedelaware3000.org/>.

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Figure 2: Example of a Low-Digit Commercial Plate
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Figure 3: Sale and Ask Price as Function of Tag Number
Sale Prices are the reported transaction price. Ask Prices are the posted asking price for a given plate. GDP changes are calculated from data reported from the St. Louis Fed.

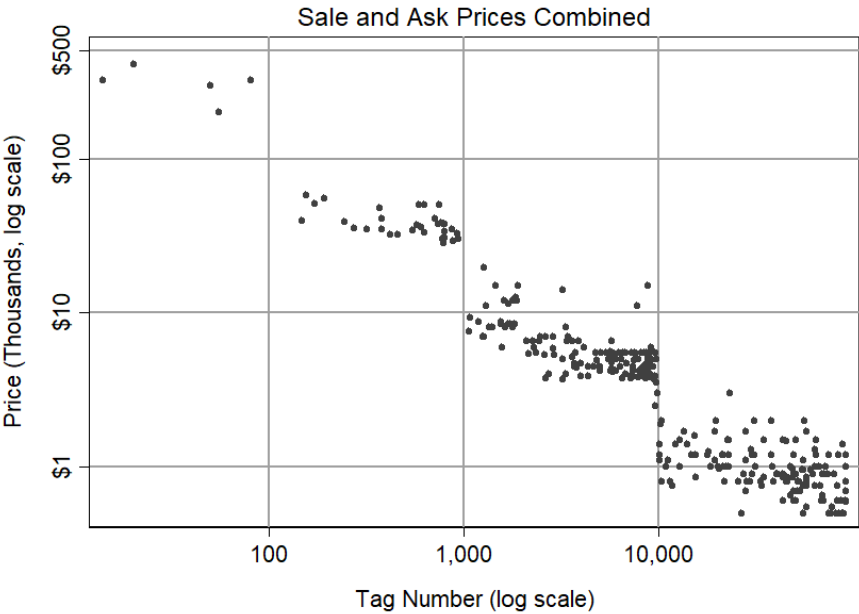


Figure 4: Average Price and Macro Indicators Through Time
 Sale Prices are the reported transaction averaged by year and number of digits. Market returns are the CRSP value-weighted market returns.

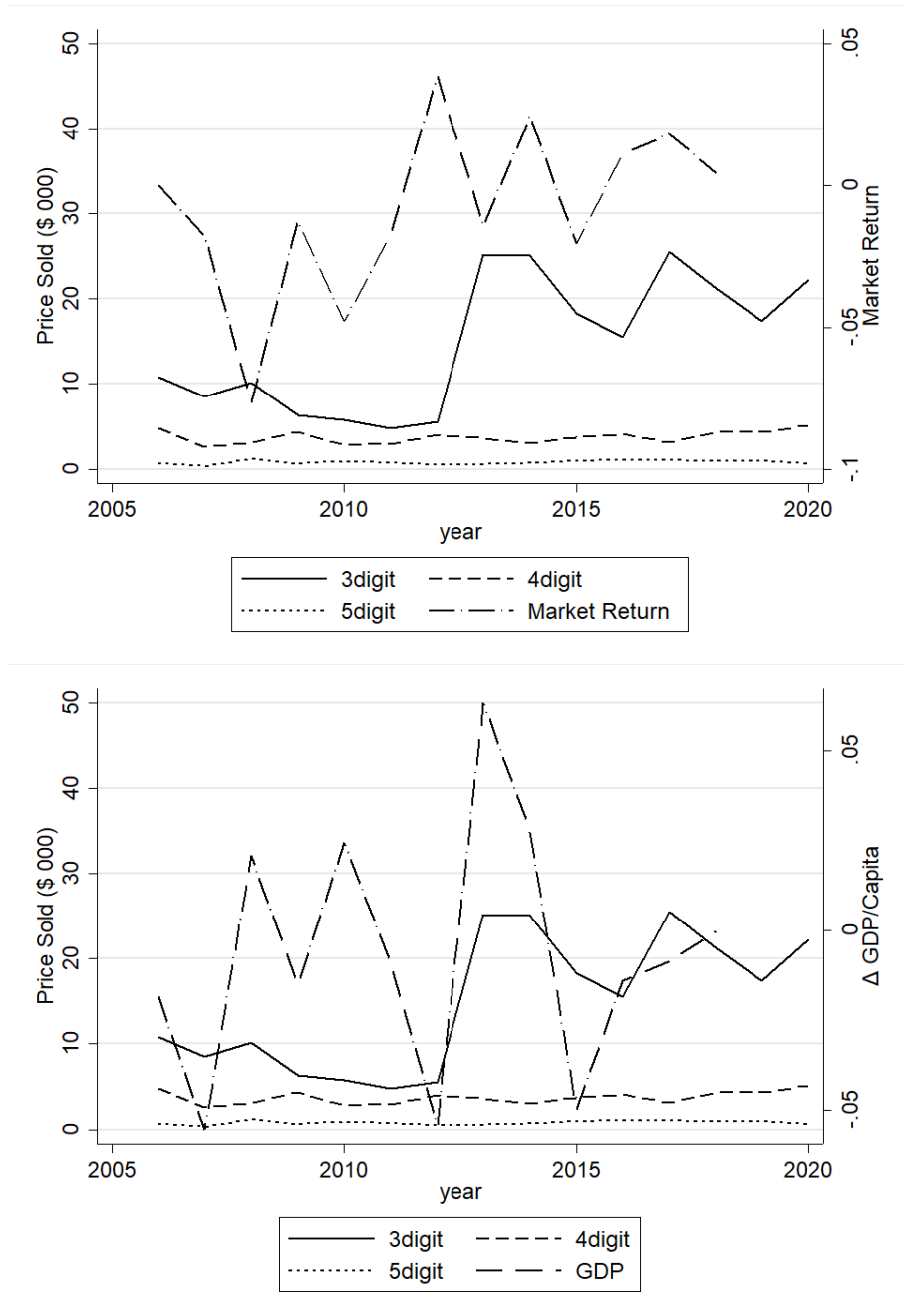


Table 1: License Tag Summary Statistics
 Sale Price is the reported transaction price in \$1,000. Ask Price is the posted ask price for a given plate reported in \$1,000. 2-,3-,4-Digits are indicator variables that represent plates with corresponding number of digits. C and PC indicate commercial plates and station wagon/SUV prefix plates, respectively.

<i>Panel A: 'No' Prefix</i>											
(2-digit)			(3-digit)			(4-digit)			(5-digit)		
Tag Number	Sale Price	Ask Price	Tag Number	Sale Price	Ask Price	Tag Number	Sale Price	Ask Price	Tag Number	Sale Price	Ask Price
mean	180.3	342.0	563	40.2	43.8	5226	6.1	6.1	36509	0.9	1.0
min	60.0	200.0	121	9.9	32.5	1018	0.9	3.9	10019	0.1	0.5
max	410.0	450.0	996	115.0	70.0	9998	15.5	16.5	94000	3.4	1.9
sd	106.3	96.2	264	17.1	10.4	2613	2.5	2.4	23967	0.5	0.3
count	18	5	60	60	21	349	349	68	122	122	32

<i>Panel B: 'C' Prefix</i>											
(2-digit)			(3-digit)			(4-digit)			(5-digit)		
Tag Number	Sale Price	Ask Price	Tag Number	Sale Price	Ask Price	Tag Number	Sale Price	Ask Price	Tag Number	Sale Price	Ask Price
mean	36.6	.	566	9.1	10.0	4881	2.0	2.5	19962	0.2	.
min	29.0	.	103	3.6	8.5	1010	0.7	1.4	19962	0.2	.
max	50.0	.	988	22.5	12.0	9931	4.5	5	19962	0.2	.
sd	7.8	.	284	4.0	1.3	2306	0.9	1.2	.	.	.
count	6	0	41	41	5	123	123	9	1	1.0	0

<i>Panel C: 'PC' Prefix</i>											
(2-digit)			(3-digit)			(4-digit)			(5-digit)		
Tag Number	Sale Price	Ask Price	Tag Number	Sale Price	Ask Price	Tag Number	Sale Price	Ask Price	Tag Number	Sale Price	Ask Price
mean	40	37.5	48.3	528	7.4	7.8	5362	1.1	1.5	.	.
min	19	23.5	45.0	100	3.2	5.8	1158	0.3	0.4	.	.
max	82	45.0	50.0	978	24.0	9.9	9665	3.5	3	.	.
sd	19	7.4	2.2	288	4.0	1.2	2605	0.7	0.7	.	.
count	12	12	4	39	8	60	60	11	0	0	0

Table 2: Sale and Ask Price as Function of Tag Number

Sale Price is the reported transaction price. Ask Price is the posted asking price for a given plate. 2-,3-,4-Digits are indicator variables equal to 1 if the plate has the corresponding number of digits, and 0 otherwise. The base level is 5-Digit plates. C and PC are indicator variables for commercial plates and station wagon/SUV prefix plates, respectively. The base level is no-prefix plates. Standard errors are clustered by tag number and reported in parenthesis.

	(1)	(2)	(3)	(4)	(5)
	Sale Price (\$000)	Ask Price (\$000)	Sale Price (\$000)	Ask Price (\$000)	Sale-Ask (\$)
	b/se	b/se	b/se	b/se	b/se
2-Digits	117.78*** (15.83)	110.93*** (22.30)	154.75*** (37.67)	66.65 (41.15)	-62388.21 (41,878.93)
3-Digits	31.59*** (1.84)	46.16*** (5.43)	38.65*** (3.59)	92.34*** (22.75)	-7,611.42*** (2,426.39)
4-Digits	9.53*** (0.72)	10.45*** (0.56)	11.46*** (1.03)	12.37*** (0.70)	-2,135.81*** (798.46)
C	-14.70*** (1.68)	-10.79*** (1.18)	-14.65*** (1.61)	-10.32*** (0.92)	2,141.88** (849.12)
PC	-22.77*** (3.39)	-11.78*** (1.16)	-23.82*** (3.69)	-11.80*** (1.11)	5,506.65* (3,216.27)
Tag Number			-0.00*** (0.00)	-0.00*** (0.00)	0.00* (0.00)
2-Digits × Tag Number			-0.74 (0.61)	0.96 (1.05)	1,003.39 (758.34)
3-Digits × Tag Number			-0.01*** (0.00)	-0.08** (0.03)	4.43 (3.51)
4-Digits × Tag Number			-0.00*** (0.00)	-0.00*** (0.00)	0.14* (0.08)
Constant	1.02*** (0.13)	1.79*** (0.07)	1.38*** (0.25)	2.31*** (0.14)	-253.38*** (58.74)
R-squared	0.543	0.578	0.561	0.657	0.399
N	831	23565	831	23565	163