

## Padua 2017 Abstract Submission

### I want to submit an abstract for:

Conference Presentation

### Corresponding Author

Robin Goldstein

### E-Mail

[robin.s.goldstein@gmail.com](mailto:robin.s.goldstein@gmail.com)

### Affiliation

University of California Agricultural Issues Center

### Keywords

Consumer behavior, price theory, price dispersion, premiumization, market segmentation, price discrimination, quality, wine, marijuana

### Research Question

Do the prices of discount products and premium products in the same broadly defined categories diverge over time?

### Methods

Summary statistics of price frequency distributions; multiple linear regressions on price frequency distributions; time series analysis of price frequency distributions; tests for multi-modality on price frequency distributions.

### Results

I observe divergence between prices of generic and premium products in two markets with very different attributes, suggesting that premium-generic divergence may be a general phenomenon in consumer markets.

### Abstract

As consumer products industries mature, they pass through different stages in qualitative differentiation. They split off into more expensive, fancier versions of products, for instance, which are qualitatively differentiated in consumer marketplaces via sensory, packaging, marketing, and information attributes. In a narrow interpretation, this differentiation may be viewed as fragmentation; most economic accounts of wine, for instance, treat red wine and white wine as different markets, and most economics accounts of automobiles treat Ferraris and minivans as different markets.

However, looking at such markets more broadly by aggregating their segments may yield insights into general price trends over time that do not surface when narrower categories are observed. In part 1 of this paper, I define an aggregated product category as a category for which products have "internal sensory indifference," i.e. with packaging removed and extrinsic information concealed, consumers do not demonstrate consistent preferences for one over the other.

I hypothesize that in aggregated consumer product markets over time, premium prices will rise while generic prices will fall, implying that only generic prices approach marginal costs of production, while the prices of premium goods diverge from both the prices of generic goods and from their own marginal costs. I define a "premiumized" market as one in which the premium markup ( $P_{max}/P_{min} - 1$ ) is greater than or equal to 100%—in other words, the premium product costs at least double what the generic product costs. I discuss my hypothesis in the context of the existing literature on product differentiation, price dispersion, and price discrimination. I explain which aspects of these accounts I adopt and which I reject, and I formalize my hypothesis.

Next, I test this generic-premium divergence hypothesis in two markets. In part 2 of the paper, I look at the segmentation of the wine market, a relatively mature U.S. market which has been premiumizing for several decades. I examine the price frequency distribution in several U.S. online wine marketplaces, and I report summary statistics.

Is the premium segment just one segment? I test the distribution for multi-modality, and I report results. In several different data sets of online wine prices, I observe multi-modal distributions with at least three local maxima: one at the global maximum, which is approximately the generic price; one at a locally modal premium price, which is approximately 1 log order of magnitude above the generic price; and another locally modal premium price, which is approximately 2 log orders of magnitude above the generic price.

I call these segments “generic,” “premium,” and “super-premium,” I attempt to describe their attributes, and I test these descriptions against the data. Next, I look at the price frequency distribution over time in the online wine market, I attempt to observe the growth and movement of each of the multi-modal segments, and I test the hypothesis that premium and discount segments are diverging.

In part 3 of the paper, I look at a much less mature U.S. consumer products market (at least in terms of white-market regulation history): marijuana, which has only recently begun to premiumize after the legalization of medical (and, more recently, recreational) marijuana in several U.S. states. Marijuana’s status as a black-market industry for so many years in the U.S. has endowed it with a number of highly unusual attributes as a consumer products market, including high marketing margins (partially attributable to a “risk premium”) and a relative lack of premiumization, with black-market premium markups of 50% or less (i.e.  $P_{max}:P_{min}$  ratios of only 1.5:1).

The transition from the black market to the white market turns out to be an interesting one: in black markets, products are less differentiated and the perceived high-low quality spread is small. In regulated white markets, however, differentiation appears to drive premium and discount prices apart. To what extent can this divergence be attributed to the flow of more high-income price-inelastic consumers into legal marketplaces? How do the attributes of the white, black, and gray markets for recreational marijuana and medical marijuana compare with each other? Can the effects of regulation and popularization be observed separately?

I attempt to answer these questions by comparing the wine results in part (2) with an analysis of California retail marijuana price data from the University of California Agricultural Issues Center’s new Retail Marijuana Price Index. Our survey collects retail price range data for discount and premium segments of dried cannabis flowers and cannabis extract cartridges from more than 500 California marijuana dispensaries.

The first round of the survey was completed in November 2016. I report on this and subsequent rounds and test my on time series data from Fall 2016 to Spring 2017 in an attempt to get a glimpse of the premiumization of the California marijuana industry in real time as it prepares for full legalization of both medical and recreational marijuana in January 2018. I draw some conclusions from the analysis of California marijuana prices over time and the trends toward premiumization in that market, and I discuss the similarities and difference between the wine and marijuana markets with respect to premiumization.

Finally, I draw some generalizations about the divergence of premium and generic prices, and suggest some potential implications for the calculation of consumer price indices, purchasing-power-parity indices, and other inputs into well-being calculations.

#### **File Upload (PDF only)**

- [Goldstein-AAWE-abstract1.pdf](#)

## ABSTRACT

“Do Premium and Generic Prices Diverge Over Time?”

Robin Goldstein<sup>1</sup>

As consumer products industries mature, they pass through different stages in qualitative differentiation. They split off into more expensive, fancier versions of products, for instance, which are qualitatively differentiated in consumer marketplaces via sensory, packaging, marketing, and information attributes. In a narrow interpretation, this differentiation may be viewed as fragmentation; most economic accounts of wine, for instance, treat red wine and white wine as different markets, and most economics accounts of automobiles treat Ferraris and minivans as different markets.

However, looking at such markets more broadly by aggregating their segments may yield insights into general price trends over time that do not surface when narrower categories are observed. In part 1 of this paper, I define an aggregated product category as a category for which products have "internal sensory indifference," i.e. with packaging removed and extrinsic information concealed, consumers do not demonstrate consistent preferences for one over the other.

I hypothesize that in aggregated consumer product markets over time, premium prices will rise while generic prices will fall, implying that only generic prices approach marginal costs of production, while the prices of premium goods diverge from both the prices of generic goods and from their own marginal costs. I define a “premiumized” market as one in which the premium markup ( $P_{\max}/P_{\min} - 1$ ) is greater than or equal to 100%—in other words, the premium product costs at least double what the generic product costs. I discuss my hypothesis in the context of the existing literature on product differentiation, price dispersion, and price discrimination. I explain which aspects of these accounts I adopt and which I reject, and I formalize my hypothesis.

Next, I test this generic-premium divergence hypothesis in two markets. In part 2 of the paper, I look at the segmentation of the wine market, a relatively mature U.S. market which has been premiumizing for several decades. I examine the price frequency distribution in several U.S. online wine marketplaces, and I report summary statistics.

Is the premium segment just one segment? I test the distribution for multi-modality, and I report results. In several different data sets of online wine prices, I observe multi-modal distributions with at least three local maxima: one at the global maximum, which

---

<sup>1</sup> University of California Agricultural Issues Center; University of Bordeaux, Department of Economics, LAREFI

is approximately the generic price; one at a locally modal premium price, which is approximately 1 log order of magnitude above the generic price; and another locally modal premium price, which is approximately 2 log orders of magnitude above the generic price.

I call these segments “generic,” “premium,” and “super-premium,” I attempt to describe their attributes, and I test these descriptions against the data. Next, I look at the price frequency distribution over time in the online wine market, I attempt to observe the growth and movement of each of the multi-modal segments, and I test the hypothesis that premium and discount segments are diverging.

In part 3 of the paper, I look at a much less mature U.S. consumer products market (at least in terms of white-market regulation history): marijuana, which has only recently begun to premiumize after the legalization of medical (and, more recently, recreational) marijuana in several U.S. states. Marijuana’s status as a black-market industry for so many years in the U.S. has endowed it with a number of highly unusual attributes as a consumer products market, including high marketing margins (partially attributable to a “risk premium”) and a relative lack of premiumization, with black-market premium markups of 50% or less (i.e.  $P_{\max}/P_{\min} \sim 1.5$ ).

The transition from the black market to the white market turns out to be an interesting one: in black markets, products are less differentiated and the perceived high-low quality spread is small. In regulated white markets, however, differentiation appears to drive premium and discount prices apart. To what extent can this divergence be attributed to the flow of more high-income price-inelastic consumers into legal marketplaces? How do the attributes of the white, black, and gray markets for recreational marijuana and medical marijuana compare with each other? Can the effects of regulation and popularization be observed separately?

I attempt to answer these questions by comparing the wine results in part (2) with an analysis of California retail marijuana price data from the University of California Agricultural Issues Center’s new Retail Marijuana Price Index. Our survey collects retail price range data for discount and premium segments of dried cannabis flowers and cannabis extract cartridges from more than 500 California marijuana dispensaries.

The first round of the survey was completed in November 2016. I report on this and subsequent rounds and test my on time series data from Fall 2016 to Spring 2017 in an attempt to get a glimpse of the premiumization of the California marijuana industry in real time as it prepares for full legalization of both medical and recreational marijuana in January 2018. I draw some conclusions from the analysis of California marijuana prices over time and the trends toward premiumization in that market, and I discuss the similarities and difference between the wine and marijuana markets with respect to premiumization.

Finally, I draw some generalizations about the divergence of premium and generic prices, and suggest some potential implications for the calculation of consumer price indices, purchasing-power-parity indices, and other inputs into well-being calculations.