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Red obsession: the ascent of fine wine in China

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The market for fine wine: a primer

What is a fine wine?

- Nowadays there are many different regions and countries in which excellent wines are produced
- But the market for *fine* wine is still dominated by wines from France and in particular those from Bordeaux (thanks to their long-standing reputation and high visibility)
- The primary characteristic that distinguishes fine wine (aka investment-grade wine) from the mass of quality wines is that **fine wines are actively traded on a secondary market**
- Several reputable sources suggest that **Bordeaux wines account for close to 90% of this market**

What are the key features of this market?

- It is highly segmented and suffers from information asymmetries and market frictions that make it rather illiquid
- As such **this market is quite inefficient** → thus **price divergences may exist** (due to the difficulty of exploiting arbitrage opportunities)

2000-2015: a busy period

The last fifteen years have seen:

- An increase in investors' interest for alternative assets and so-called "alternative alternatives"
- An unprecedented string of great vintages (2000, 2005, 2009, 2010)
- Dramatic increase in popularity and demand for fine wines in China
- The accession of China to the WTO in 2005, which has spurred imports of wine due to a decrease from 43% to 14% in custom duties
- The abolition of excise duties in Hong Kong in 2008 has favored the emergence of a new major auction venue that plays the role of trading hub for the Chinese market
- As a result, **China is now the world's biggest importer of Bordeaux wines** and **Hong-Kong is the world's largest place for wine auctions**

In this paper, we analyze the joint impact that the increase in demand in China and the ascent of Hong-Kong as a major trading venue have had on the prices of fine wines

Hypotheses

Hypothesis 1: fine wine sold at Hong Kong wine auctions commands a premium as compared to other auction places.

Hypothesis 2: the Hong Kong premium is stronger for higher rated and visible wines.

This hypothesis is split into two sub-hypotheses:

- **Hypothesis 2a:** the Hong Kong premium is stronger the higher the expert score of a wine.
- **Hypothesis 2b:** the Hong Kong premium is stronger the higher the brand power/reputation of a wine.

Hypothesis 3: the Hong Kong premium has declined over time.

Data

- Our dataset contains information on auction hammer prices:
 - For the 14 most famous Bordeaux wines (vintages 1945-2010)
 - For the period 2007 – 2014
 - For the 5 major global auction houses present in Hong Kong and on other auction places in the world (Acker Merrall & Condit, Christie's, Sotheby's, Zachy's and Bonham's)
 - This represents a total of **94,494 lots** or 869,029 bottles for a value of 707 million USD

- We also have information on:
 - Wine quality (proxy: Parker score)
 - Number of bottles per lot
 - Whether the bottles are in their original wooden case (OWC) or not

Descriptive statistics (1)

Median price, number of lots sold and turnover per château

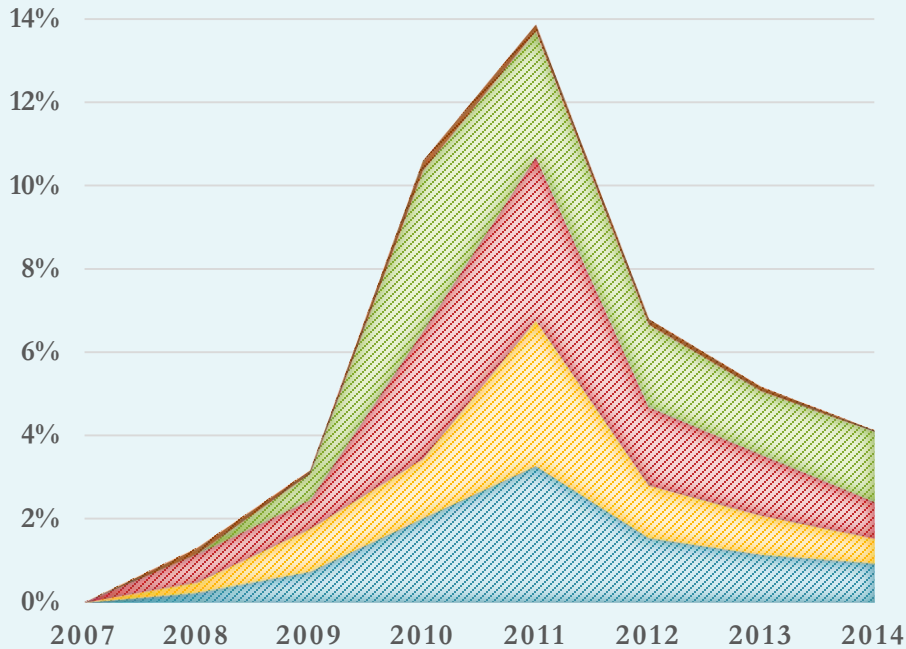
Château	Region	Rank	Worldwide (without HK)			Hong-Kong (only)		
			Median Price	Nobs [in %]	Turnover [in %]	Median Price	Nobs [in %]	Turnover [in %]
Angélus	St-Emilion	1A	203	1.5%	0.44%	290	0.4%	0.21%
Ausone	St-Emilion	1A	447	1.3%	0.87%	833	0.7%	1.02%
Cheval Blanc	St-Emilion	1A	436	4.9%	3.27%	620	2.2%	2.47%
Haut Brion	Pessac-Léognan	1gcc	397	7.3%	4.64%	542	3.2%	3.36%
Lafite Rothschild	Pauillac	1gcc	825	11.5%	13.16%	1'119	5.7%	12.11%
Lafleur	Pomerol	NC	605	1.3%	0.95%	655	0.8%	0.90%
Latour	Pauillac	1gcc	528	8.4%	6.42%	839	3.7%	5.57%
Margaux	Margaux	1gcc	491	8.0%	5.23%	650	3.4%	3.85%
Mission Haut Brion	Pessac-Léognan	NC	408	3.2%	1.74%	552	1.6%	1.43%
Mouton Rothschild	Pauillac	1gcc	386	11.2%	7.31%	576	4.4%	5.27%
Pavie	St-Emilion	1A	182	1.6%	0.49%	288	0.6%	0.29%
Pétrus	Pomerol	NC	1'553	5.5%	8.00%	2'225	2.4%	6.99%
Le Pin	Pomerol	NC	1'546	0.7%	0.90%	2'002	0.5%	1.03%
Yquem	Sauternes	1sup	400	3.4%	1.53%	435	0.9%	0.57%

Descriptive statistics (2)

Trading volume per location and per year:

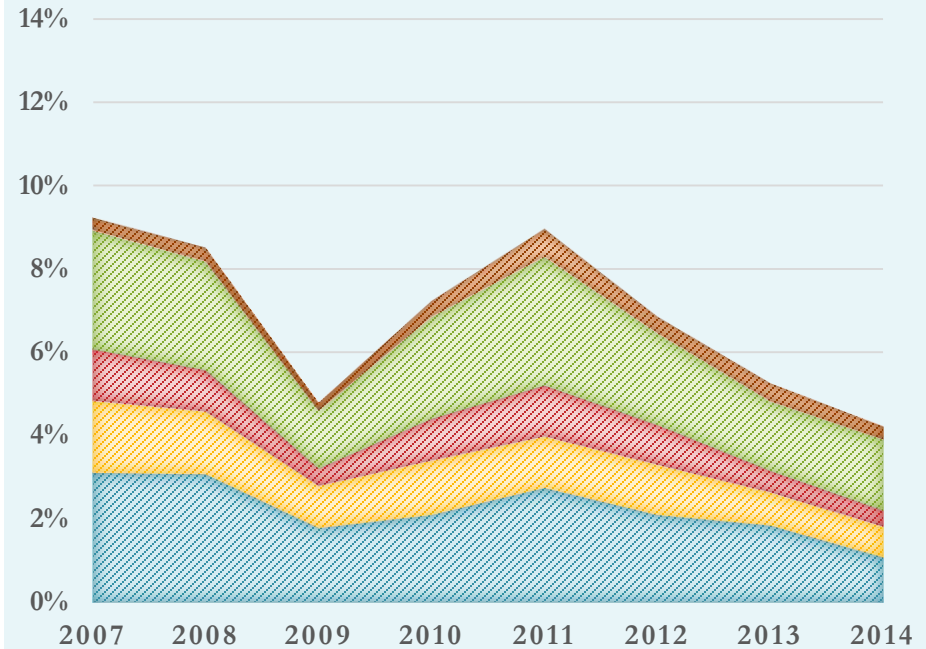
HONG-KONG

Christie's Zachy's Acker Merrall & Condit Sotheby's Bonhams



REST OF THE WORLD

Christie's Zachy's Acker Merrall & Condit Sotheby's Bonhams



Methodology

- Estimation of a hedonic regression:
 - This approach assumes that the price of a wine bottle depends on its attributes and the implicit value attached to each of them
 - It is robust towards illiquidity (as it is able to account for the fact that fine wines are not exchanged regularly at auctions)
 - It also allows us to control for a variety of wine (e.g., reputation, quality) and transaction-specific (e.g., lot size, OWC) attributes influencing auction prices
- Our hedonic regression for a specific lot i takes the following form:

$$p_i = \beta_0 + \sum_{j=1}^J x_{ij}\beta_j + \sum_{t=1}^T D_{it}\theta_t + \sum_{k=1}^K Z_{ik}\gamma_k + \varepsilon_i$$

Model specifications

Variables	Details	Used in specification				
		1	2	3	4	5
A. Variables specific to the wine auctioned :						
Château	Dummy variables for each Châteaux	×	×	×	×	×
Vintage	Dummy variables for vintages 1945 to 2009	×	×	×	×	×
Rating	Existence of a Parker's rating (dummy variable), Parker' score and score ²	×	×	×	×	×
OWC-12	Dummy variable to control if the wine is sold in the 12-bottle OWC	×	×	×	×	×
Quantity	Number of bottles sold in a particular lot	×	×	×	×	×
B. Variables specific to the auction venue :						
Auction house	Dummy variables for each acution house	×	×	×	×	×
Time of sale	Dummy variables for each auction date (used to construct the index)	×	×	×	×	×
Auction location	Dummy variables for Europe, USA and Hong-Kong	×	×	×	×	×
HK premium × Parker score	Dummy variables to estimate the influence of Parker scores on the HK premium		×			
HK premium × Châteaux	Dummy variables to estimate château-specific HK price premia			×		
HK premium × Châteaux' brand power	Interaction term to assess if the HK price premium depends on the châteaux' brand power				×	
HK premium × time of sale	Interaction terms (set of dummy variables) used to estimate a time-varying HK premium					×
		H1		H2		H3

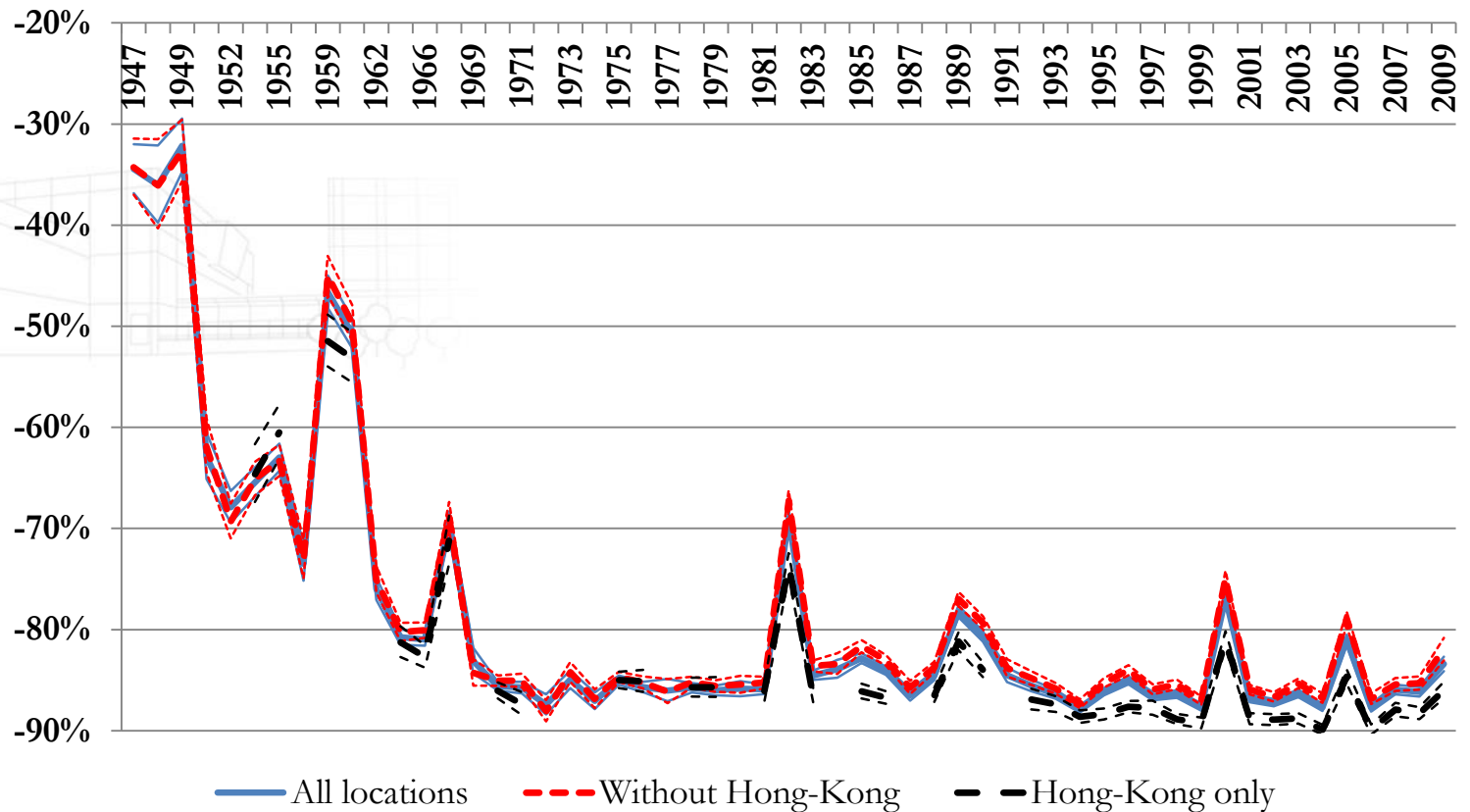
Hypothesis 1 (specification 1)

	1a) All auctions		1b) Without Hong-Kong		1c) Hong-Kong only	
	Coeff.	p-value	Coeff.	p-value	Coeff.	p-value
Intercept	6.23	<0.01%	6.14	<0.01%	7.37	<0.01%
Ausone	1.05	<0.01%	1.01	<0.01%	1.09	<0.01%
Cheval Blanc	0.95	<0.01%	0.99	<0.01%	0.83	<0.01%
Haut Brion	0.75	<0.01%	0.77	<0.01%	0.69	<0.01%
Lafite Rothschild	1.37	<0.01%	1.34	<0.01%	1.38	<0.01%
Lafleur	1.22	<0.01%	1.25	<0.01%	1.13	<0.01%
Latour	1.01	<0.01%	1.02	<0.01%	0.98	<0.01%
Margaux	0.80	<0.01%	0.83	<0.01%	0.74	<0.01%
Mission Haut Brion	0.43	<0.01%	0.46	<0.01%	0.34	<0.01%
Mouton Rothschild	0.83	<0.01%	0.83	<0.01%	0.82	<0.01%
Pavie	-0.09	<0.01%	-0.10	<0.01%	-0.09	<0.01%
Pétrus	2.16	<0.01%	2.17	<0.01%	2.11	<0.01%
Le Pin	2.23	<0.01%	2.22	<0.01%	2.21	<0.01%
Yquem	0.64	<0.01%	0.70	<0.01%	0.43	<0.01%
Zachy's	-0.03	<0.01%	0.02	<0.01%	-0.17	<0.01%
Acker Merrall Condit	0.03	<0.01%	0.09	<0.01%	-0.09	<0.01%
Sotheby's	0.02	<0.01%	0.03	<0.01%	-0.05	<0.01%
Bonhams	-0.11	<0.01%	-0.08	<0.01%	-0.24	<0.01%
Europe	0.02	<0.01%	0.05	<0.01%		
Hong-Kong	0.18	<0.01%				
Quantity	-0.00	<0.01%	-0.01	<0.01%	-0.00	<0.01%
OWC-12	0.02	<0.01%	0.04	<0.01%	0.01	10.91%
Parker's rating ²	0.51	<0.01%	0.49	<0.01%	0.50	<0.01%
Parker score	0.40	<0.01%	0.41	<0.01%	0.39	<0.01%
Parker score ²	0.04	<0.01%	0.04	<0.01%	0.05	<0.01%
Observations :	92538		63947		28229	
R ² :	0.85	<0.01%	0.84	<0.01%	0.87	<0.01%

Note: the reference (intercept) is Château Angélys 1945 sold in North America at Christie's in January 2007.

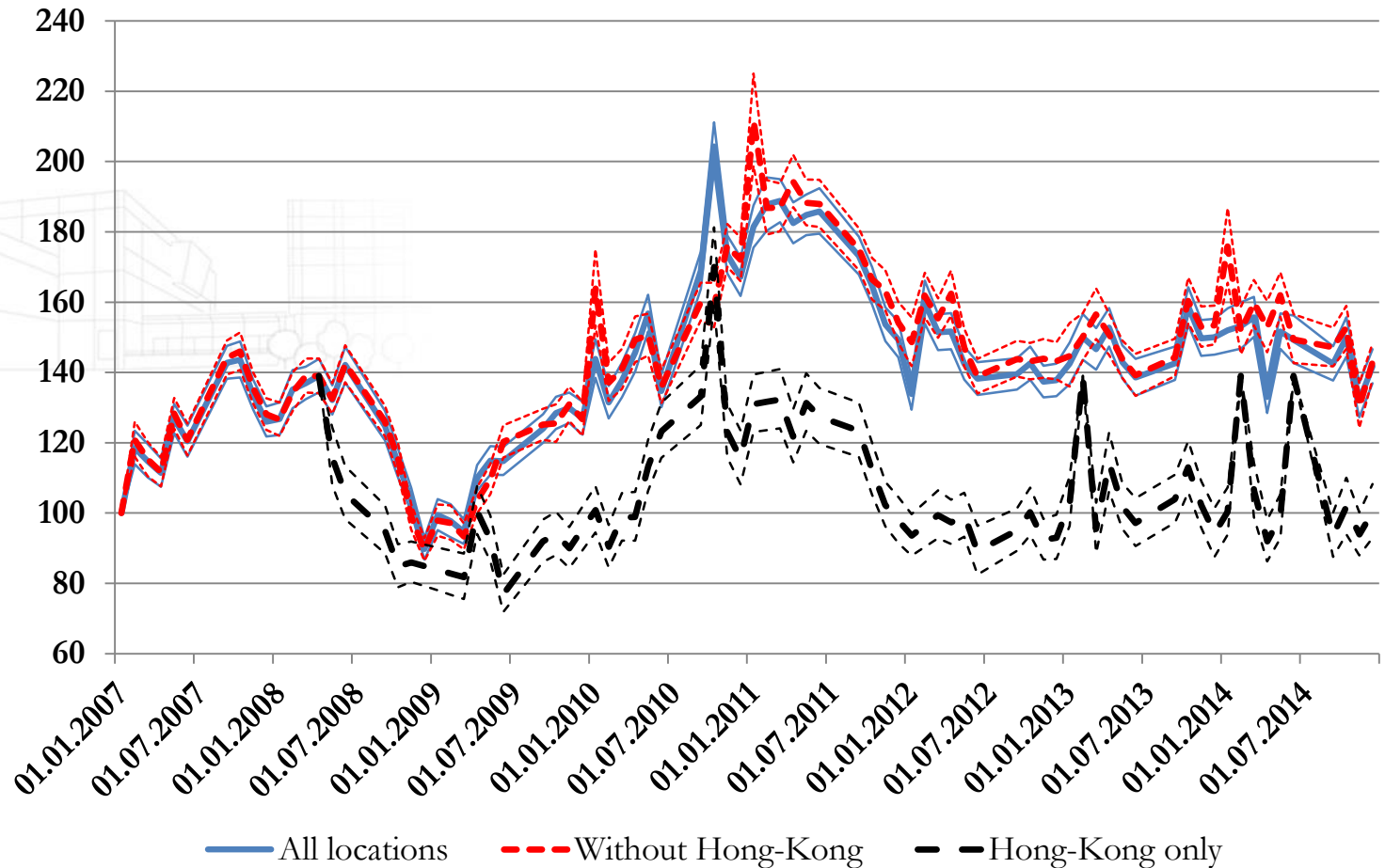
Detailed analysis – specification 1

Vintage and wine prices:



Detailed analysis – specification 1

Auction location and wine prices:

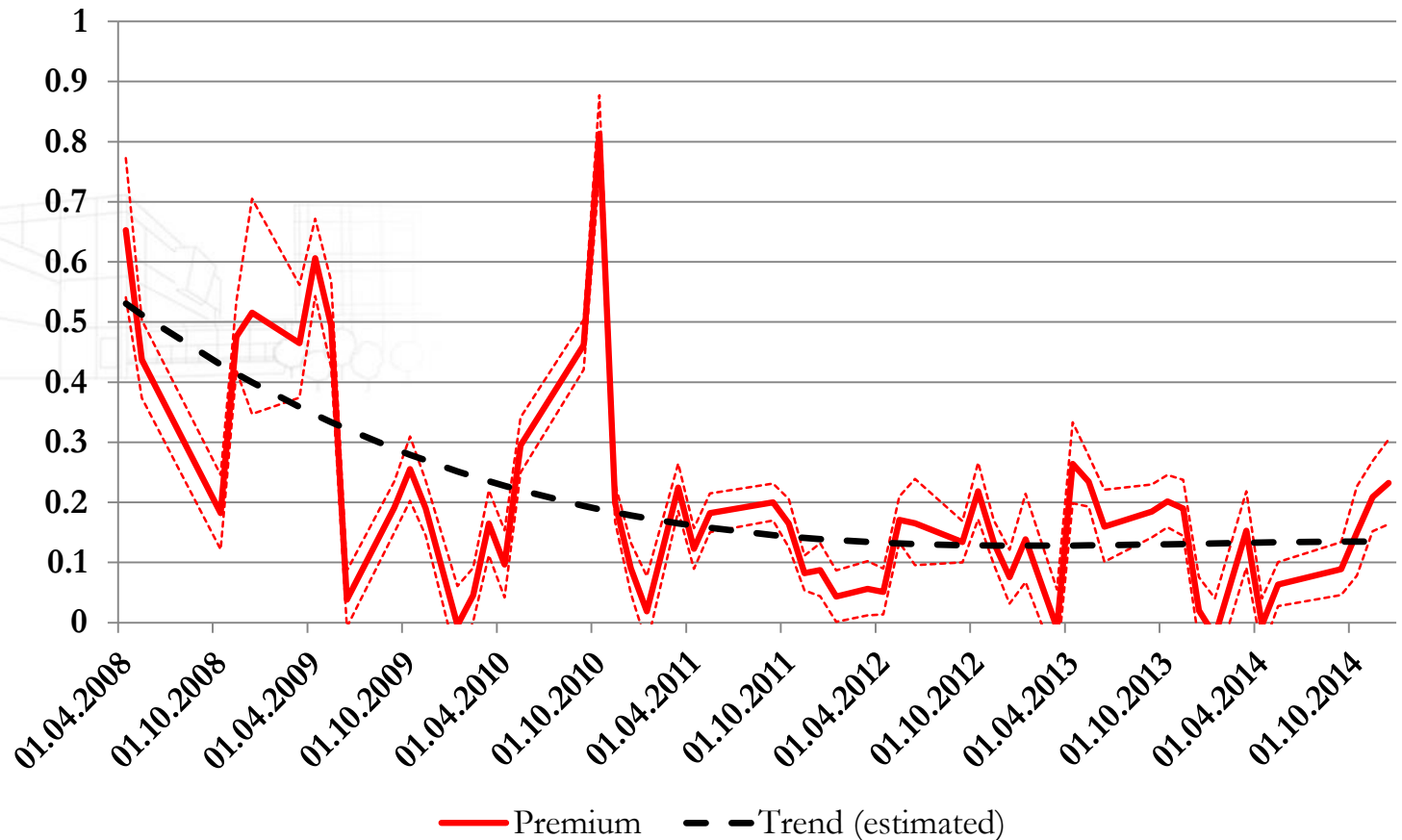


Hypothesis 2 (specifications 2 to 4)

Specification 2			Specification 3			Specification 4		
Parker score	Coeff.	p-value	Château	Coeff.	p-value	Brand power	Coeff.	p-value
Not rated	0.355	<0.01%	Angélus	0.171	<0.01%	Hong-Kong	0.233	<0.01%
50 - 79	0.574	<0.01%	Ausone	0.288	<0.01%	Hong-Kong ×	-0.006	<0.01%
80 - 89	0.320	<0.01%	Cheval Blanc	0.065	<0.01%	Liv-ex rank		
90 - 95	0.187	<0.01%	Haut Brion	0.132	<0.01%			
96 - 98	0.112	<0.01%	Lafite Rothschild	0.263	<0.01%			
99	0.041	<0.01%	Lafleur	0.100	<0.01%			
100	0.205	<0.01%	Latour	0.198	<0.01%			
			Margaux	0.121	<0.01%			
			Mission Haut Brion	0.106	<0.01%			
			Mouton Rothschild	0.220	<0.01%			
			Pavie	0.168	<0.01%			
			Pétrus	0.196	<0.01%			
			Le Pin	0.203	<0.01%			
			Yquem	-0.015	26.15%			

Hypothesis 3 (specification 5)

The **declining** Hong-Kong premium:



Robustness tests

- **Impact of outliers:** the results are not significantly altered if the 1% highest residuals in absolute terms are removed from the regressions
- **Definition of the reference price:** results remain qualitatively similar if median prices are used instead of individual hammer prices
- **Impact of auction houses:** we re-estimate the regressions for each auction house separately and find that they all display a strong and significant positive premium in HK → The premium is a phenomenon that remains valid across the whole Hong Kong market and is not driven by a single auction house.
- **Impact of wine age:** all wines, irrespective of their age display a positive premium in HK. The premium however appears to increase the older a wine gets → this suggests older wines yield an additional rarity premium.

Summary

- Fine wines sold on the Hong Kong market have on average triggered a 19% premium over the sample period
 - We argue that the emergence of the premium is the outcome of a strong latent demand from Chinese customers and the incapacity to conduct arbitrage strategies on the wine market
- The price premium is not uniform across wines → the premium is strongest for the most famous wines and those with a perfect Parker score
 - We attribute this phenomenon to the relative inexperience of market participants. Buyers have entered the market by purchasing those wines that were the most visible
- The premium is declining over time.
 - We argue that this is mainly due to the closing of the educational gap that leads buyers to consider a wider range of possible wine purchases

Thank you for your attention!



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