

From Kanpai to Banzai: the Rise of Sake Export and Cultural Spillover in Trade

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Context and Motivation

- Persistent frictions in trade ('dark costs', Head and Mayer, 2013)
 - Possibly reflecting culture and preference-related frictions
 - Hence potentially long-lasting barriers to trade
- Cultural globalization may nonetheless accelerate preference shifts for certain goods
 - Are there cultural spillovers in trade?
 - For ex: do we buy more Fiat since we often go to pizza place?
 - The question pertains to the complementarity nature of the goods

Context and Motivation

- We suggest to explore these questions in obviously complementary goods in food/beverage industry: **sake** and sushi
- We focus on sake world exports 2001-2016
 - we test standard trade determinants
 - and also the role of sushi popularity (space x time variation)

Context and Motivation

- Sake essentially produced in Japan
 - increasingly exported since early 2000s
 - aim is to compensate for the decline in national consumption
 - worldwide promotion campaign by JETRO ('cool Japan', etc), Wine Advocate's awards to 78 sakes (90/100), etc
 - distributed in restaurants but increasingly in bars, wine shops, grocery shops and supermarkets (US 2017: 2/3 sold off-premise)

Context and Motivation

- Sushi has pervaded Western food habits
 - surge over a decade
 - process started earlier in Asia and the US (influenced by migration, ex: California rolls)
 - greatly accelerated lately through food diversification and cultural globalization
 - 50,000 japanese restaurants in the world in 2013, around 100,000 in 2018
 - possibly strong leverage effect for diffusion/promotion of sake

Literature

- Small literature on cultural convergence and trade spillovers
 - Taste convergence during globalization process (Aizenman and Brooks 2008)
 - Bilateral trade tends to reduce cultural distance (Maystre et al., 2014)
 - Trade of cultural goods encourages overall trade as it impacts on values and perceptions about the importing country (Disdier et al., 2010a)
- Very limited literature on trade spillovers:
 - Within-firm trade spillovers from the 'superstar' products towards complementary peripheral products (Arnarson, 2016)
 - Carry-Along-Trade: export of a product not produced by the firm (Bernard, Blanchard, Van Beveren and Vandebussche, 2014)
 - Bundling of goods (theory, not trade: Gentzkow, 2007)

Empirical Approach

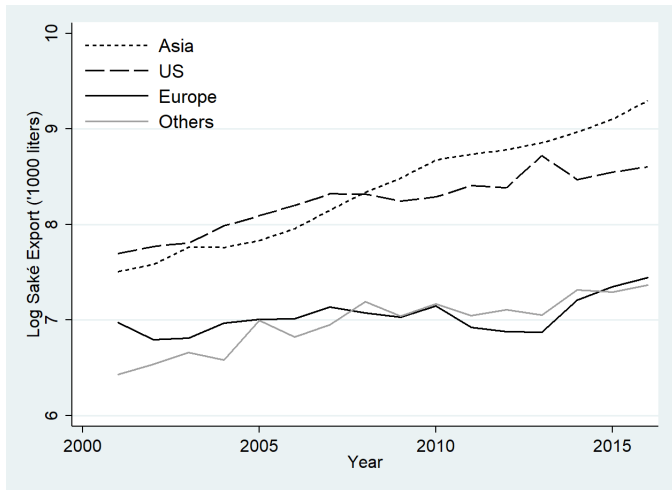
- Estimate a gravity model of sake export
 - std model a la Anderson and Van Wincoop (2003, 2004)
 - 32 destinations countries x 16 years (2001-2016)
 - usual determinants (GDP, distance, market size, etc, cf table)
- Google Search for 'sushi':
 - no possible to have data on sushi restaurant
 - Google Trend: search score for key word 'sushi'
 - good marker of cultural/food interest for sushi culture and potential awareness about sake
 - a priori little simultaneity bias issue (Arnanson, 2016)
 - dominating force is sushi culture
 - not an exported product but an exported culture (Issenberg, 2007)
 - diffused through atomic agents (restaurant), independent from export companies (often not even japanese!)
 - Google search even more general than restaurant (popularity measure)

Empirical Approach

| Dep. Variable: | Unit / Variable Type |
|--------------------------|----------------------------------|
| Sake export (volume) * | 1000 liters |
| Explanatory Variables: | Unit / Variable Type |
| GDP | 2010 PPP\$ |
| GDP/capita | 2010 PPP\$ |
| Distance | Km |
| Exchange Rate | Yen/LCU |
| Ad Valorem Equivalent * | average rate of tariff/tax, in % |
| Average Income Tax | in % of GDP |
| Unit Value * | \$/liter |
| Asie | dummy |
| Hubs | dummy |
| Google Trend for "Sushi" | 0-100 search score |

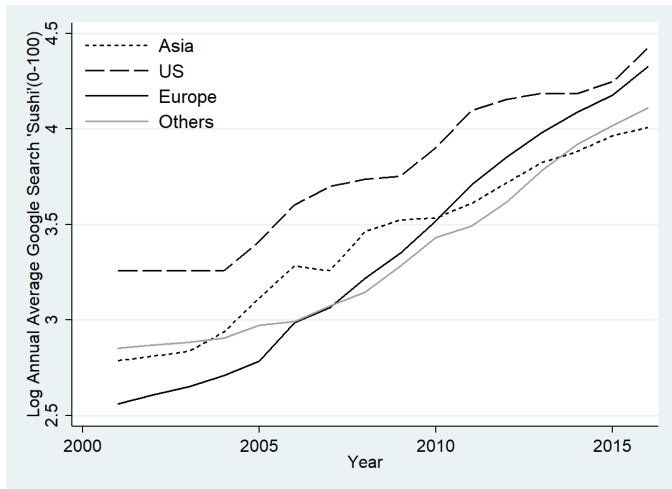
Descr Stats (1)

Figure: Evolution of exports since 2001 (volume, log)



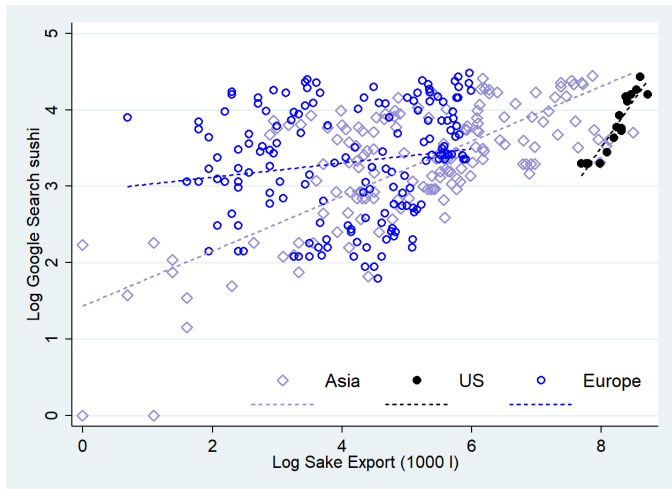
Descr Stats (2)

Figure: Evolution of Google Search for Sushi (log)



Descr Stats (3)

Figure: Sake Export vs Sush Popularity (logs)



Results: Determinants of Sake Exports

| | (1) | (2) | (3) | (4) | (5) | (6) | (7) | (8) |
|--------------------------------|---------------------|----------------------|----------------------|----------------------|----------------------|----------------------|----------------------|----------------------|
| Ln GDP / capita | 0.609*** (0.079) | 1.040*** (0.076) | 0.923*** (0.071) | 0.877*** (0.086) | 0.580*** (0.089) | 0.630*** (0.093) | 0.586*** (0.089) | 0.583*** (0.093) |
| Ln Pop Size | 0.807*** (0.049) | 0.932*** (0.043) | 0.965*** (0.040) | 0.963*** (0.040) | 0.881*** (0.039) | 0.893*** (0.040) | 0.773*** (0.043) | 0.776*** (0.044) |
| Ln Distance | | -1.483*** (0.116) | -1.321*** (0.108) | -1.370*** (0.120) | -1.211*** (0.114) | -1.214*** (0.114) | -1.232*** (0.110) | -1.246*** (0.113) |
| Hubs (0/1) | | | 1.668*** (0.180) | 1.650*** (0.181) | 1.202*** (0.179) | 1.142*** (0.181) | 0.927*** (0.178) | 0.917*** (0.183) |
| Ln Exch. Rate (Yen/LCU) | | | | 0.033 (0.034) | 0.015 (0.032) | 0.003 (0.033) | -0.016 (0.032) | -0.018 (0.033) |
| Ln Average AVE | | | | | -0.359*** (0.044) | -0.360*** (0.044) | -0.361*** (0.043) | -0.363*** (0.044) |
| Ln Unit Value | | | | | | -0.082* (0.044) | -0.082** (0.042) | -0.085* (0.043) |
| Ln Google Search 'Sushi' | | | | | | | 0.623*** (0.099) | |
| Ln Google Search 'Sushi' (lag) | | | | | | | | 0.600*** (0.100) |
| Year Dummies | YES | YES | YES | YES | YES | YES | YES | YES |
| Observations | 512 | 512 | 512 | 512 | 512 | 512 | 512 | 480 |
| Adjusted R-squared | 0.358 | 0.517 | 0.588 | 0.588 | 0.636 | 0.638 | 0.665 | 0.665 |

Standard errors in parentheses. *** p<0.01, ** p<0.05, * p<0.1

Results: Determinants of Sake Exports (cont)

| | (9) | (10) | (11) | (12) | (13) |
|--------------------------------|----------------------|----------------------|----------------------|----------------------|----------------------|
| Ln GDP / capita | 0.998*** (0.101) | 0.889*** (0.103) | 0.930*** (0.101) | 0.859*** (0.098) | 0.844*** (0.101) |
| Ln Pop Size | 0.957*** (0.039) | 0.892*** (0.041) | 0.810*** (0.045) | 0.680*** (0.047) | 0.668*** (0.049) |
| Ln Distance | -0.287* (0.165) | -0.365** (0.163) | -0.298* (0.161) | -0.382** (0.155) | -0.426*** (0.159) |
| Hubs (0/1) | 0.758*** (0.179) | 0.866*** (0.178) | 0.894*** (0.175) | 0.723*** (0.170) | 0.733*** (0.175) |
| Ln Exch. Rate (Yen/LCU) | 0.032 (0.031) | 0.037 (0.031) | 0.027 (0.030) | 0.006 (0.029) | 0.001 (0.030) |
| Ln Average AVE | -0.296*** (0.043) | -0.273*** (0.043) | -0.107* (0.057) | -0.098* (0.055) | -0.079 (0.057) |
| Ln Unit Value | -0.037 (0.042) | -0.026 (0.041) | -0.051 (0.041) | -0.056 (0.039) | -0.064 (0.040) |
| Asie (0/1) | 1.948*** (0.262) | 1.809*** (0.260) | 1.842*** (0.255) | 1.692*** (0.246) | 1.613*** (0.252) |
| USA (0/1) | | 1.352*** (0.323) | 1.732*** (0.330) | 1.824*** (0.317) | 1.903*** (0.326) |
| Prohibition (0/1) | | | -0.999*** (0.237) | -1.083*** (0.227) | -1.212*** (0.233) |
| Ln Google Search 'Sushi' | | | | 0.599*** (0.091) | |
| Ln Google Search 'Sushi' (lag) | | | | | 0.580*** (0.092) |
| Year Dummies | YES | YES | YES | YES | YES |
| Observations | 512 | 512 | 512 | 512 | 480 |
| Adjusted R-squared | 0.674 | 0.685 | 0.695 | 0.720 | 0.722 |

Standard errors in parentheses. *** p<0.01, ** p<0.05, * p<0.1

Estimation issues

- Robustness checks:
 - issues: heteroskedasticity and zero trade flows
 - model estimated by OLS (few zeros: 32 main importers)
 - alternatively: Poisson pseudo-maximum likelihood (Santos Silva and Tenreyro, 2006), deals with over-dispersion in the data (Head and Mayer, 2013) and large proportion of zeros (Santos Silva and Tenreyro, 2011)
- Endogeneity of AVE:
 - local authorities may increase custom duties on alcohols when imports increase (more revenue + tax vice good)
 - as Bouet et al (2015): AVE instrumented by local average tax rate (in % of GDP)

Results: Alternative Methods

| | OLS | PPML | IV | OLS | PPML | IV |
|--------------------------------|----------------------|----------------------|----------------------|----------------------|----------------------|----------------------|
| Ln GDP / capita | 0.818*** (0.100) | 0.922*** (0.087) | 0.818*** (0.100) | 0.796*** (0.104) | 0.886*** (0.088) | 0.796*** (0.104) |
| Ln Pop Size | 0.773*** (0.044) | 0.628*** (0.047) | 0.773*** (0.044) | 0.772*** (0.045) | 0.603*** (0.047) | 0.772*** (0.045) |
| Ln Distance | -0.452*** (0.158) | -0.611*** (0.119) | -0.452*** (0.158) | -0.506*** (0.163) | -0.660*** (0.118) | -0.506*** (0.163) |
| Hubs (0/1) | 0.700*** (0.174) | 0.419*** (0.107) | 0.700*** (0.174) | 0.707*** (0.180) | 0.418*** (0.108) | 0.707*** (0.180) |
| Ln Exch. Rate (Yen/LCU) | 0.018 (0.030) | -0.142*** (0.027) | 0.018 (0.030) | 0.015 (0.031) | -0.136*** (0.026) | 0.015 (0.031) |
| Ln Average AVE (a) | -0.278*** (0.041) | -0.365*** (0.051) | -0.278*** (0.041) | -0.282*** (0.042) | -0.349*** (0.050) | -0.282*** (0.042) |
| Ln Unit Value | -0.030 (0.040) | -0.102*** (0.036) | -0.030 (0.040) | -0.036 (0.041) | -0.106*** (0.036) | -0.036 (0.041) |
| Asie (0/1) | 1.663*** (0.251) | 0.943*** (0.193) | 1.663*** (0.251) | 1.575*** (0.259) | 0.844*** (0.194) | 1.575*** (0.259) |
| USA (0/1) | 1.410*** (0.311) | 1.180*** (0.176) | 1.410*** (0.311) | 1.440*** (0.322) | 1.255*** (0.176) | 1.440*** (0.322) |
| Ln Google Search `Sushi` | 0.575*** (0.093) | 0.585*** (0.062) | 0.575*** (0.093) | | | |
| Ln Google Search `Sushi` (lag) | | | | 0.554*** (0.094) | 0.621*** (0.063) | 0.554*** (0.094) |
| Year Dummies | YES | YES | YES | YES | YES | YES |
| Observations | 512 | 512 | 512 | 480 | 480 | 480 |
| R-squared | 0.707 | 0.923 (b) | 0.707 | 0.706 | 0.931 (b) | 0.706 |

Standard errors in parentheses. *** p<0.01, ** p<0.05, * p<0.1

(a) AVE instrumented by average income tax in IV column

(b) Pseudo-R2

Concluding remarks

- We suggest the first study on trade determinant of Japanese sake
 - context of massive rise in sake exports for a decade
 - sake responds to usual trade determinants
- Expansion seems associated with the diffusion of sushi culture:
 - sake strongly reacts to the popularity of sushi
 - estimate: +1% in 'sushi' Google Search yields +.6% sake export
 - still relevant today: "Food pairing is the next marketing frontier for sake" (Vine Connections)..even if not genuine japanese culture ('adding rice on rice')
- More generally:
 - little exploration of cultural spillovers in trade
 - trade frictions pertaining to taste/country differences may partly be overcome by cultural globalization and pervasive effects on preferences

Thank you for your attention

