Quality, Trade, and Exchange Rate Pass-Through

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Motivations

- Exchange rate fluctuations have small effects on the prices of internationally traded goods (incomplete "exchange rate pass-through" into import prices)

- Incomplete pass-through affects the conduct of monetary and exchange rate policies, and helps to understand how firms set prices and react to shocks

- Recent literature has looked at firm- and product-level **heterogeneity** in explaining this phenomenon (focusing on export prices and "pricing-to-market")

- Little is known on the relationship between pass-through and product quality (Auer and Chaney, 2008, Auer et al., 2012)

This Paper

Explores theoretically and empirically how quality affects heterogeneous pass-through

Theory

- We build on Berman et al. (2012) and Chatterjee et al. (2013) and extend the model of Corsetti and Dedola (2005) with local distribution costs and variable markups, allowing for multi-product firms that are heterogeneous in the quality of the goods they export

- The response of export prices to a real depreciation **increases with quality** (there is more pricing-to-market/lower pass-through)

- The response of export volumes to a real depreciation **decreases with quality**

- The two responses are stronger for higher income destination countries

Empirics

- Argentinean firm-level **exports** of highly disaggregated wine products: pricing-to-market behavior which can be related to product quality measured using experts wine rankings (Wine Spectator and Robert Parker)
- Data set mostly composed of multi-product firms
- Period 2002-2009 during which large currency fluctuations in Argentina
- Results
  - We find strong evidence for the predictions of the theory in the data
  - Robust to alternative specifications and to the endogeneity of quality

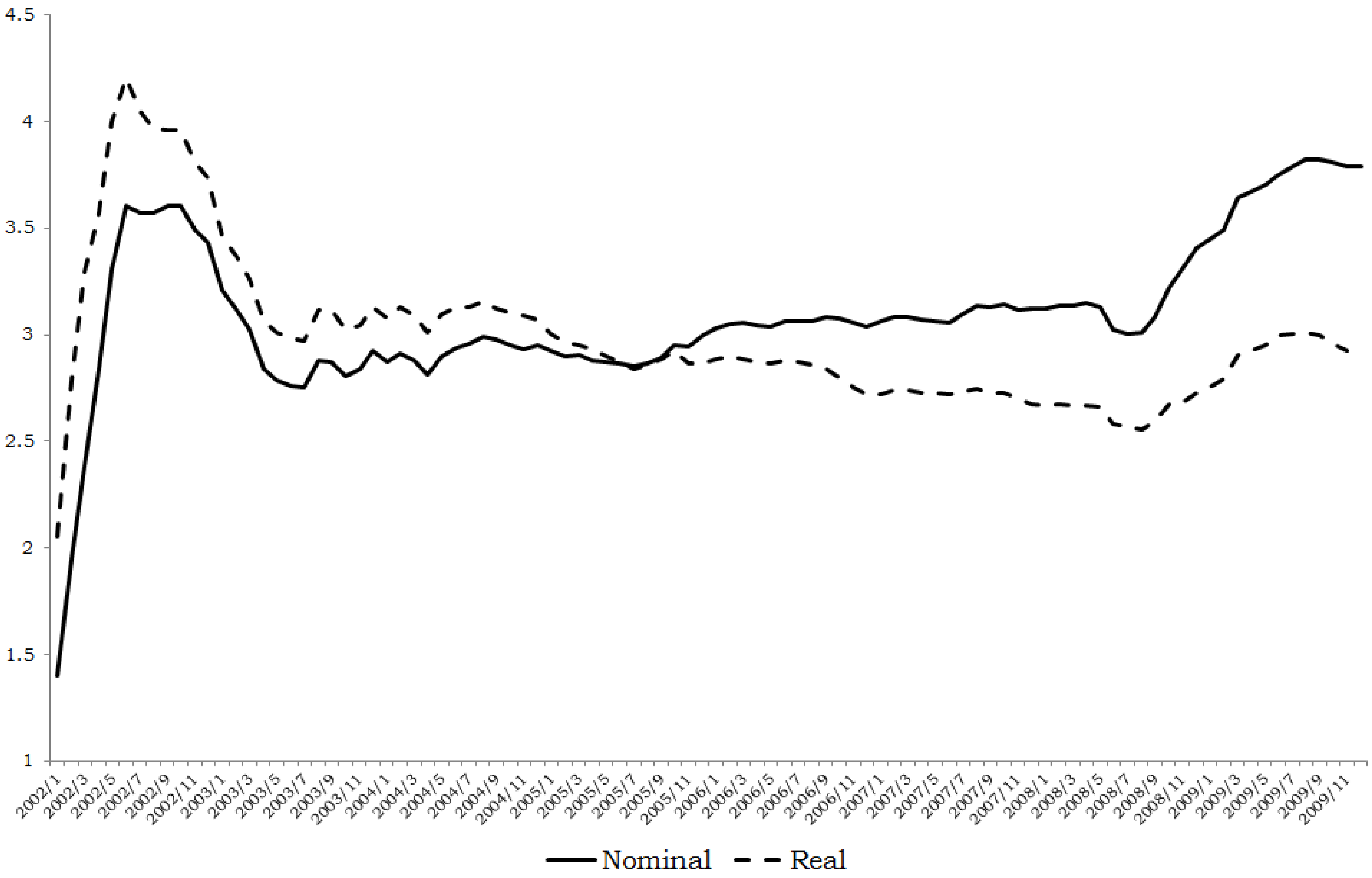

Figure 3: Peso per US dollar, January 2002 to December 2009

A Model of Pricing-to-Market and Quality

- Berman et al. (2012) and Chatterjee et al. (2013) extend the model of Corsetti and Dedola (2005) with local distribution costs allowing for firm heterogeneity
  - Berman et al. (2012): **single-product** firms heterogeneous in productivity
  - Chatterjee et al. (2013): **multi-product** firms heterogeneous in productivity both at the firm- and product levels. Firms are most efficient at producing a “core” product with **low marginal costs** (Mayer et al., 2014)
- We allow firms to be heterogeneous in the **quality** of the goods they produce. They produce a “core” product with **highest quality** and **high marginal costs** (Kugler and Verhoogen, 2012)

The Model

- The Home country (Argentina) exports to multiple destinations in one sector characterized by monopolistic competition

- A representative agent in destination country j has preferences over the consumption of a continuum of differentiated varieties $\mathbf{\Psi}$, where $x_j(\varphi)$ is the consumption of variety φ, $s(\varphi)$ the quality of variety φ and $\sigma > 1$

$$U(C_j) = \left[\int_{\mathbf{\Psi}} \left[s(\varphi) x_j(\varphi) \right]^{\frac{\sigma-1}{\sigma}} d\varphi \right]^{\frac{\sigma}{\sigma-1}} \tag{1}$$

- Each firm produces a "core" product with the highest quality and an efficiency Φ. If r is the rank of products in increasing order of distance from the firm's core ($r = 0$), a firm produces a product r with an efficiency level φ, where $\vartheta > 1$ (Mayer et al., 2014)

$$\varphi(\Phi, r) = \Phi\vartheta^{r} \tag{2}$$

- Higher quality goods have a lower efficiency and higher marginal costs

$$s(\varphi(\Phi, r)) = \left(\frac{w}{\varphi(\Phi, r)}\right)^{\lambda}, \tag{3}$$

where $\lambda > 1$ implies that markups rise with quality and w is the wage of Home

- Firms face an iceberg trade cost $\tau_j > 1$, a fixed cost of exporting F_j and an additive (per unit) distribution cost in destination j

- If distribution requires η_j units of labor in j per unit sold and w_j is the wage rate in j, distribution costs are given by $\eta_j w_j s(\varphi(\Phi, r))$. Higher quality goods have higher distribution costs

- As distribution is paid in the importer's currency, distribution costs are unaffected by real exchange rate changes

- In j's currency, the consumer price in j of a good exported from Home to j is

$$p_j^c(\varphi) \equiv \frac{p_j(\varphi(\Phi, r))\tau_j}{\varepsilon_j} + \eta_j w_j s(\varphi(\Phi, r)) \tag{4}$$

- Quantity demanded for a variety in country j

$$x_j(\varphi) = Y_j P_j^{\sigma-1}\left[\frac{p_j(\varphi(\Phi, r)\tau_j}{s(\varphi(\Phi, r))\,\varepsilon_j} + \eta_j w_j\right]^{-\sigma} \quad (5)$$

- The costs, in currency of the Home country, of producing $x_j(\varphi)\,\tau_j$ units of each good (inclusive of transportation costs) and selling them to country j are

$$c_j(\varphi) = \frac{w x_j(\varphi(\Phi, r))\,\tau_j}{\varphi(\Phi, r)} + F_j \quad (6)$$

- In Home currency, the profit maximizing export price for each product is

$$
\begin{aligned}
p_j(\varphi) &= \frac{\sigma}{\sigma - 1}\left(1 + \frac{\eta_j q_j \varphi(\Phi, r) s\left(\varphi(\Phi, r)\right)}{\sigma \tau_j}\right)\frac{w}{\varphi(\Phi, r)} \\
&= m\left(\varphi(\Phi, r)\right)\frac{w}{\varphi(\Phi, r)}, \qquad (7)
\end{aligned}
$$

where $q_j \equiv \varepsilon_j w_j / w$ is the real exchange rate between Home and j

- Local distribution costs lead to variable markups $m\left(\varphi(\Phi, r)\right)$ that increase with quality $s\left(\varphi(\Phi, r)\right)$, the real exchange rate q_j (i.e., a real depreciation) and local distribution costs η_j

- Volume of exports $x_j(\varphi)$

$$x_j(\varphi) = \left(\frac{\sigma - 1}{\sigma}\right)^{\sigma} Y_j P_j^{\sigma-1} \left[\frac{w}{\varphi(\Phi, r) s(\varphi(\Phi, r))\varepsilon_j}\tau_j + \eta_j w_j\right]^{-\sigma} \quad (8)$$

- The elasticity (in absolute value) of the exporter's demand $x_j(\varphi)$ with respect to the export price $p_j(\varphi)$ is

$$e_j = \left|\frac{\partial x_j(\varphi)}{\partial p_j(\varphi)}\frac{p_j(\varphi)}{x_j(\varphi)}\right| = \frac{\sigma\tau_j + \eta_j q_j \varphi(\Phi, r) s(\varphi(\Phi, r))}{\tau_j + \eta_j q_j \varphi(\Phi, r) s(\varphi(\Phi, r))}, \quad (9)$$

which is decreasing in quality and with a real depreciation

Prediction 1 *The firm- and product-specific elasticity of the export price* $p_j(\varphi)$ *to a change in the real exchange rate* q_j*, denoted by* e_{p_j} *which captures the degree of pricing-to-market, increases with the quality of the good exported,* $s(\varphi(\Phi, r))$

$$e_{p_j} = \left| \frac{\partial p_j(\varphi)}{\partial q_j} \frac{q_j}{p_j(\varphi)} \right| = \frac{\eta_j q_j \varphi(\Phi, r) s(\varphi(\Phi, r))}{\sigma \tau_j + \eta_j q_j \varphi(\Phi, r) s(\varphi(\Phi, r))}$$

Prediction 2 *The firm- and product-specific elasticity of the volume of exports* $x_j(\varphi)$ *to a change in the real exchange rate* q_j*, denoted by* e_{x_j}*, decreases with the quality of the good exported,* $s(\varphi(\Phi, r))$

$$e_{x_j} = \left| \frac{\partial x_j(\varphi)}{\partial q_j} \frac{q_j}{x_j(\varphi)} \right| = \frac{\sigma \tau_j}{\tau_j + \eta_j q_j \varphi(\Phi, r) s(\varphi(\Phi, r))}$$

Heterogeneity in the Preference for Quality

- Consumers in richer countries have a stronger preference for higher quality goods (e.g., Hallak, 2006)

- Now consider

$$U(C_j) = \left[\int_{\Psi} \left[s(\varphi, y_j) x_j(\varphi) \right]^{\frac{\sigma-1}{\sigma}} d\varphi \right]^{\frac{\sigma}{\sigma-1}}, \tag{10}$$

  where we replace $s(\varphi)$ by $s(\varphi, y_j)$ to capture that the intensity of preference for quality increases in per capita income, y_j

- Local distribution costs $\eta_j w_j s(\varphi, y_j)$ are higher in higher income countries (Dornbusch, 1989)

Prediction 3 *The firm- and product-specific elasticity of the export price $p_j(\varphi)$ to a change in the real exchange rate q_j, denoted by e_{p_j}, increases with the quality of the good exported $s(\varphi(\Phi, r), y_j)$, and by more for higher income than for lower income destination countries:*

$$e_{p_j} = \left| \frac{\partial p_j(\varphi)}{\partial q_j} \frac{q_j}{p_j(\varphi)} \right| = \frac{\eta_j q_j \varphi\left(\Phi, r\right) s(\varphi(\Phi, r), y_j)}{\sigma \tau_j + \eta_j q_j \varphi\left(\Phi, r\right) s(\varphi(\Phi, r), y_j)}.$$

Prediction 4 *The firm- and product-specific elasticity of the volume of exports $x_j(\varphi)$ to a change in the real exchange rate q_j, denoted by e_{x_j}, decreases with the quality of the good exported $s(\varphi(\Phi, r), y_j)$, and by more for higher income than for lower income destination countries:*

$$e_{x_j} = \left| \frac{\partial x_j(\varphi)}{\partial q_j} \frac{q_j}{x_j(\varphi)} \right| = \frac{\sigma \tau_j}{\tau_j + \eta_j q_j \varphi\left(\Phi, r\right) s(\varphi(\Phi, r), y_j)}.$$

Trade Customs Data

- Exports data from Argentinean customs (Nosis)
- For each export flow,
  - Name of exporter
  - Destination country
  - Date of shipment (2002-2009)
  - Product (wine name, type, grape, vintage year, container): firm specific
  - FOB value of exports in US dollars
  - Volume of exports (in liters)

- Export values converted to Pesos using the monthly Peso/USD exchange rate
- Unit values of exports (value of FOB exports in Pesos over volume in liters)
- Data aggregated at yearly frequency
- Manufacturing only (drop wholesalers, retailers)
- Wine only (drop sparkling wine, dessert wines and other varieties)
- For each exporter, drop unit values larger/smaller than 100 times the median
- Mostly multi-product firms

Disaggregation

The 6-digit HS distinguishes 4 "products." At the 12-digit level, Argentina distinguishes 11 "products"

22.04.10	10.000.D	Sparkling wine – Champagne variety
	90.000.G	Sparkling wine – Not Champagne variety
	90.100.M	Sparkling wine – Gassified wine (i.e., aerated using CO_2)
	90.900.F	Sparkling wine – Other
22.04.21	00.100.A	Sweet wine; $<$ 2 liters
	00.200.F	Fine wine; $<$ 2 liters
	00.900.U	Other wine; $<$ 2 liters
22.04.29	00.100.W	Sweet wine; $>$ 2 liters
	00.200.B	Fine wine; $>$ 2 liters
	00.900.P	Other wine; $>$ 2 liters
22.04.30	00.000.X	Wine; other grape must

We observe **21,647** different wines in the full data set (but only use 31 percent of them – **6,720** wines – which represent 43 percent of the total FOB value exported)

Quality

Crozet et al. (2012) use experts quality rankings for French Champagne exports

Here, two alternative rankings: Wine Spectator and Parker

- Both "blind tasting"
- Tasting by "peer-group"
- Price not taken into account

Wine Spectator (50,100)		**Parker** (50,100)	
95-100	Great	96-100	Extraordinary
90-94	Outstanding	90-95	Outstanding
85-89	Very good	80-89	Above average/very good
80-84	Good	70-79	Average
75-79	Mediocre	60-69	Below average
50-74	Not recommended	50-59	Unacceptable

- **Wine Spectator** (www.winespectator.com)
  - Quality 55-97 according to the name, grape, type and vintage year
  - Trade and quality data matched for 209 producers and 6,720 wines
- **Parker** (www.erobertparker.com)
  - Quality 81-98 according to the name, grape, type and vintage year
  - Trade and quality data matched for 135 producers and 2,433 wines

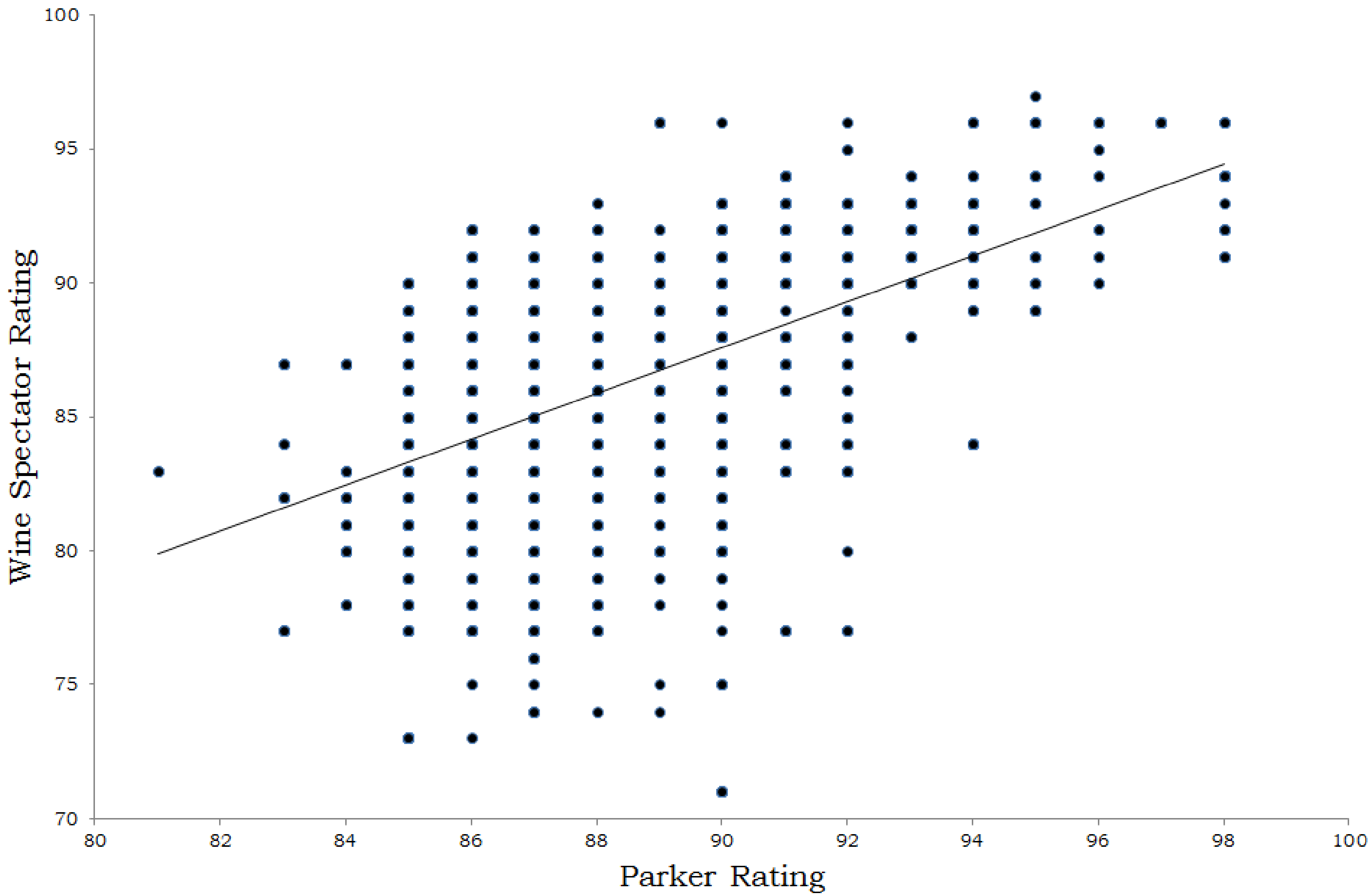

Figure 2: Wine Spectator versus Parker rankings

Quality and Unit Values

$$\ln UV_{ij,t}^{k} = \beta_1 \ln q_{j,t} + \beta_2 s^k + \underbrace{\beta_3 \ln q_{j,t} \times s^k} + \xi_{it} + \mu_{ij} + \theta_{grape} + \zeta_{type} + \gamma_{vintage} + \varrho_{HS} + \kappa_p + \epsilon_{ij,t}^{k}$$

- An increase in $q_{j,t}$ (a real depreciation) increases unit values
- Export unit values increase with quality s^k
- With a depreciation, unit values increase **more** the higher quality is

Quality and Export Volumes

$$
\begin{aligned}
\ln X^k_{ij,t} &= \alpha_1 \ln q_{j,t} + \alpha_2 s^k + \underbrace{\alpha_3 \ln q_{j,t} \times s^k} + \alpha_4 Z_{j,t} + \xi_{it} + \mu_{ij} + \theta_{grape} + \zeta_{type} \\
&\quad + \gamma_{vintage} + \varrho_{HS} + \kappa_p + \epsilon^k_{ij,t}
\end{aligned}
$$

- An increase in $q_{j,t}$ (a real depreciation) increases export volumes
- The response of exports to a depreciation **decreases** with quality
- $Z_{j,t}$ includes gravity controls (destination real GDP and REER)

Table 7: Baseline Results for Unit Values

	(1)	(2)	(3)
ln $q_{j,t}$	0.140^a (3.71)	0.008 (0.14)	–
s^k	0.032^a (11.29)	0.033^a (11.33)	–
ln $q_{j,t} \times s^k$	–	0.001^a (2.84)	0.002^a (3.17)
Mean quality	–	0.142^a (3.78)	–
"Not recommended" (62)	–	0.106^a (2.66)	–
"Mediocre" (77)	–	0.130^a (3.42)	–
"Good" (82)	–	0.138^a (3.65)	–
"Very good" (87)	–	0.146^a (3.86)	–
"Outstanding" (92)	–	0.154^a (4.06)	–
"Great" (97.5)	–	0.162^a (4.24)	–
N	41,576	41,576	41,576

Table 7: Baseline Results for Export Volumes

	(1)	(2)	(3)
ln $q_{j,t}$	1.916^a (3.64)	2.418^a (4.59)	–
s^k	-0.050^a (-8.03)	-0.051^a (-8.24)	–
ln $q_{j,t} \times s^k$	–	-0.006^a (-3.66)	-0.005^a (-3.10)
Mean quality	–	1.904^a (3.63)	–
"Not recommended" (62)	–	2.043^a (3.91)	–
"Mediocre" (77)	–	1.952^a (3.73)	–
"Good" (82)	–	1.922^a (3.66)	–
"Very good" (87)	–	1.892^a (3.60)	–
"Outstanding" (92)	–	1.861^a (3.53)	–
"Great" (97.5)	–	1.828^a (3.46)	–
N	41,576	41,576	41,576

Note: the regressions also include the REER/GDP

Higher Quality Wines, Higher Distribution Costs?

- Top quality wines are more likely to be sold in specialized wine stores than in supermarkets (i.e., higher retail costs)

- Top quality wines need to be stored in specialized refrigeration units to maintain their temperature (i.e., higher storage costs)

- Tasting events to promote wines are generally organized by distributors for higher quality wines only (i.e., higher marketing and advertising costs)

- Higher quality wines often require heavier bottles and cartons for shipping (i.e., higher transport costs)

Table 8: Nonlinearities

Dep variable	ln $UV^k_{ij,t}$	ln $X^k_{ij,t}$	ln $UV^k_{ij,t}$	ln $X^k_{ij,t}$
ln $q_{j,t}$	0.049 (0.47)	2.370^a (4.08)	0.025 (0.42)	2.382^a (4.52)
s^k_1	0.028^a (4.79)	-0.028^c (−1.81)	–	–
s^k_2	0.026^a (4.91)	-0.031^b (−2.27)	–	–
s^k_3	0.026^a (5.08)	-0.031^b (−2.39)	–	–
s^k_4	0.025^a (5.11)	-0.030^b (−2.41)	–	–
s^k_5	0.029^a (6.06)	-0.036^a (−3.00)	–	–
s^k_{1-5}	–	–	0.032^a (11.01)	-0.048^a (−7.79)
s^k_6	0.031^a (6.31)	-0.048^a (−4.17)	0.035^a (10.34)	-0.062^a (−9.86)
ln $q_{j,t} \times s^k_1$	0.002 (1.36)	−0.006 (−1.46)	–	–
ln $q_{j,t} \times s^k_2$	0.002 (1.19)	-0.006^c (−1.67)	–	–
ln $q_{j,t} \times s^k_3$	0.001 (1.02)	−0.005 (−1.60)	–	–
ln $q_{j,t} \times s^k_4$	0.001 (1.05)	-0.005^c (−1.67)	–	–
ln $q_{j,t} \times s^k_5$	0.001 (1.31)	-0.006^c (−1.84)	–	–
ln $q_{j,t} \times s^k_{1-5}$	–	–	0.001^b (2.52)	-0.006^a (−3.41)
ln $q_{j,t} \times s^k_6$	0.004^b (2.17)	-0.007^b (−2.03)	0.004^a (2.60)	-0.007^a (−2.98)

Note: regressions (3) and (4) also include the REER/GDP

Table 9: Heterogeneity across Destination Countries

Dependent variable	ln $UV_{ij,t}^k$	ln $X_{ij,t}^k$
ln $q_{j,t}$	2.027^a (3.66)	-0.016 (-0.01)
s^k	0.034^b (2.02)	0.162^a (3.03)
ln $y_{j,t}$	-0.004 (-0.02)	4.743^a (8.60)
ln $q_{j,t} \times s^k$	-0.015^b (-2.44)	0.010 (0.55)
ln $q_{j,t} \times$ ln $y_{j,t}$	-0.219^a (-3.67)	0.114 (0.61)
ln $y_{j,t} \times s^k$	0.000 (-0.14)	-0.021^a (-3.92)
ln $q_{j,t} \times s^k \times$ ln $y_{j,t}$	0.002^a (2.72)	-0.001 (-0.62)
Mean quality	0.097^b (2.35)	0.921^c (1.78)
"Not recommended" (62)	0.030 (0.66)	0.974^c (1.88)
"Great" (97.5)	0.134^a (3.18)	0.892^c (1.71)
N	41,576	41,576

Note: column (2) also includes the REER/GDP

Table 9: Heterogeneity across Destination Countries

Dependent variable	$\ln UV_{ij,t}^{k}$	$\ln X_{ij,t}^{k}$
$\ln q_{j,t} \times Low$	0.222 (1.31)	8.096^{a} (6.70)
$\ln q_{j,t} \times High$	−0.028 (−0.44)	2.337^{a} (4.32)
$s^{k} \times Low$	0.031^{a} (5.25)	-0.031^{c} (−1.93)
$s^{k} \times High$	0.033^{a} (11.27)	-0.050^{a} (−8.11)
$\ln q_{j,t} \times s^{k} \times Low$	0.000 (0.01)	0.003 (0.99)
$\ln q_{j,t} \times s^{k} \times High$	0.002^{a} (3.23)	-0.008^{a} (−4.07)
Low : Mean quality	0.223^{b} (1.98)	8.353^{a} (7.20)
$High$: Mean quality	0.135^{a} (3.48)	1.685^{a} (3.14)
N	41,576	41,576

Note: column (2) also interacts the REER/GDP with the high/low income dummies

Endogeneity of Quality

- The Wine Spectator rankings are produced from blind tastings where the "price is not taken into account in scoring." But the "tasters are told [...] the general type of wine (varietal and/or region) and the vintage year"

- For Parker, "neither the price nor the reputation of the producer/grower affect the rating in any manner" although the "tastings are done in peer-group, single-blind conditions (the same types of wines are tasted against each other)"

- The tasters have some information about the wines which might affect their scores, leading to an **endogeneity bias** which direction is, however, unclear

Instruments

- **Climatic factors**: for each province p and each month m during the growing season September-March (Ashenfelter, 2008)
  - Average temperature $t_{p,m}$ (Celsius)
  - Total rainfall $r_{p,m}$ (millimeters)

- **Geographic factors**: altitude Alt_p of each province (meters)

- Missing observations so slightly reduced sample size

Table 10: The Endogeneity of Quality

Dependent variable: ln $UV_{ij,t}^{k}$			
ln $q_{j,t}$	0.026	0.158[a]	−0.997[c]
	(0.42)	(3.93)	(−1.78)
s^k	0.033[a]	0.022[b]	0.021[b]
	(11.36)	(2.16)	(2.07)
ln $q_{j,t} \times s^k$	0.002[a]	–	0.014[b]
	(2.86)		(2.06)
Mean quality	0.161[a]	–	0.191[a]
	(3.96)		(4.27)
"Not recommended" (62)	0.124[a]	–	−0.130
	(2.92)		(−0.90)
"Mediocre" (77)	0.148[a]	–	0.080
	(3.63)		(1.46)
"Good" (82)	0.156[a]	–	0.150[a]
	(3.84)		(3.64)
"Very good" (87)	0.164[a]	–	0.220[a]
	(4.04)		(4.23)
"Outstanding" (92)	0.172[a]	–	0.290[a]
	(4.22)		(3.73)
"Great" (97.5)	0.180[a]	–	0.367[a]
	(4.39)		(3.30)
Estimator	OLS	IV	IV
N	37,723	37,723	37,723

Table 10: The Endogeneity of Quality

Dependent variable: ln $X^k_{ij,t}$			
ln $q_{j,t}$	2.147[a] (3.95)	1.836[a] (3.28)	−0.269 (−0.14)
s^k	−0.050[a] (−7.75)	−0.099[b] (−2.48)	−0.070[c] (−1.82)
ln $q_{j,t} \times s^k$	−0.004[a] (−2.71)	–	0.025 (1.17)
Mean quality	1.771[a] (3.31)	–	1.902[a] (3.35)
"Not recommended" (62)	1.873[a] (3.51)	–	1.315[c] (1.86)
"Mediocre" (77)	1.806[a] (3.38)	–	1.699[a] (2.97)
"Good" (82)	1.784[a] (3.34)	–	1.826[a] (3.24)
"Very good" (87)	1.762[a] (3.30)	–	1.954[a] (3.39)
"Outstanding" (92)	1.740[a] (3.25)	–	2.082[a] (3.42)
"Great" (97.5)	1.715[a] (3.20)	–	2.222[a] (3.35)
Estimator	OLS	IV	IV
N	37,723	37,723	37,723

Note: regressions also include the REER/GDP

Extensions

- Distribution Costs (Campa and Goldberg, 2010)
- Productivity (banded sales and firm size)
- Asymmetries

Robustness on Quality

- Quality (1,6)
- Parker ratings
- For each firm, rank products by average unit values
- Compute **average quality per wine name and type**
  - Increases sample coverage from 43 to 63 percent of total exports
  - Apply this procedure to the rankings (50,100) and (1,6)
- Include **unrated** wines
  - Assign to the wines which vintage year is missing the ranking of the wines with the same name, grape, and type on a (1,6) scale
  - Assign a value of one to the wines produced by firms which are unranked by either the Wine Spectator or Parker (Crozet et al., 2012)
  - Increases sample coverage to 60 percent of total exports

Robustness: The Nature of Wine

- Wine is an **exhaustible resource**: drop vintage year as a product characteristic

- **Capacity constraints** in producing higher quality wines: control for total FOB exported for each wine over the whole period

Other Robustness Checks

- Unit values in US dollars per liter
- Post-2002 (less pricing-to-market)
- Pre-2008 (financially constrained firms price-to-market less, Strasser, 2013)
- Intensive margin (Campos, 2010)
- Drop the US and countries pegged to the US dollar (crawling peg after 2002)
- Adjusted CPI for 2008 and 2009 (Cavallo, 2013)
- Monthly frequency
- Dynamics (one and two lags)
- Include wholesalers and retailers

Conclusions

- Quality explains heterogeneous pricing-to-market and exchange rate pass-through
- The export prices (quantities) of higher quality products respond more (less) to real exchange rate changes
- These effects are stronger for high income destination countries
- Results are robust to various measures of quality, specifications, endogeneity
- Quality is economically important to explain pass-through

We allow firms to be heterogeneous in the **quality** of the goods they produce. They produce a "core" product with **highest quality** and **high marginal costs**

- The quality of wine depends on the quality of grapes. But higher quality wines can be assumed to have higher marginal costs
  - Require higher quality/more expensive inputs (Kugler and Verhoogen, 2012)
  - Higher quality grapes are trimmed and pruned more carefully, requiring more skilled labor
  - Use oak barrels for ageing and fermentation but due to the cost of the oak and to the short lifetime of the barrels these turn out to be very expensive

Table A1: Price Breakdown for Non-EU Wine sold in Retail Outlets in the UK

Retail price	£5.76	£7.19	£8.83	£10.09
VAT (20%)	£0.96	£1.20	£1.47	£1.68
Retail margin	£1.92	£2.40	£2.94	£3.36
Duty	£1.90	£1.90	£1.90	£1.90
Distributor margin	£0.11	£0.21	£0.40	£0.51
Common Customs Tariff	£0.11	£0.11	£0.11	£0.11
Transport	£0.13	£0.13	£0.13	£0.13
Winemaker	£0.63	£1.25	£1.88	£2.40

Source: Joseph (2012).

Related Literature

- Pricing-to-market and incomplete exchange rate pass-through
  - Countries: Knetter (1989), Campa and Goldberg (2005)
  - Products: Gopinath et al. (2010), Gopinath and Itskhoki (2010)
  - Products and quality: Auer and Chaney (2008), Auer et al. (2012)
  - Firms: Amiti et al. (2012), Berman et al. (2012), Chatterjee et al. (2013)
- Quality and trade
  - Countries: Schott (2004), Hummels and Klenow (2005), Khandelwal (2010)
  - Industries: Hallak (2006)
  - Products: Baldwin and Harrigan (2011), Johnson (2012)
  - Firms: Kugler and Verhoogen (2012), Crozet et al. (2012)

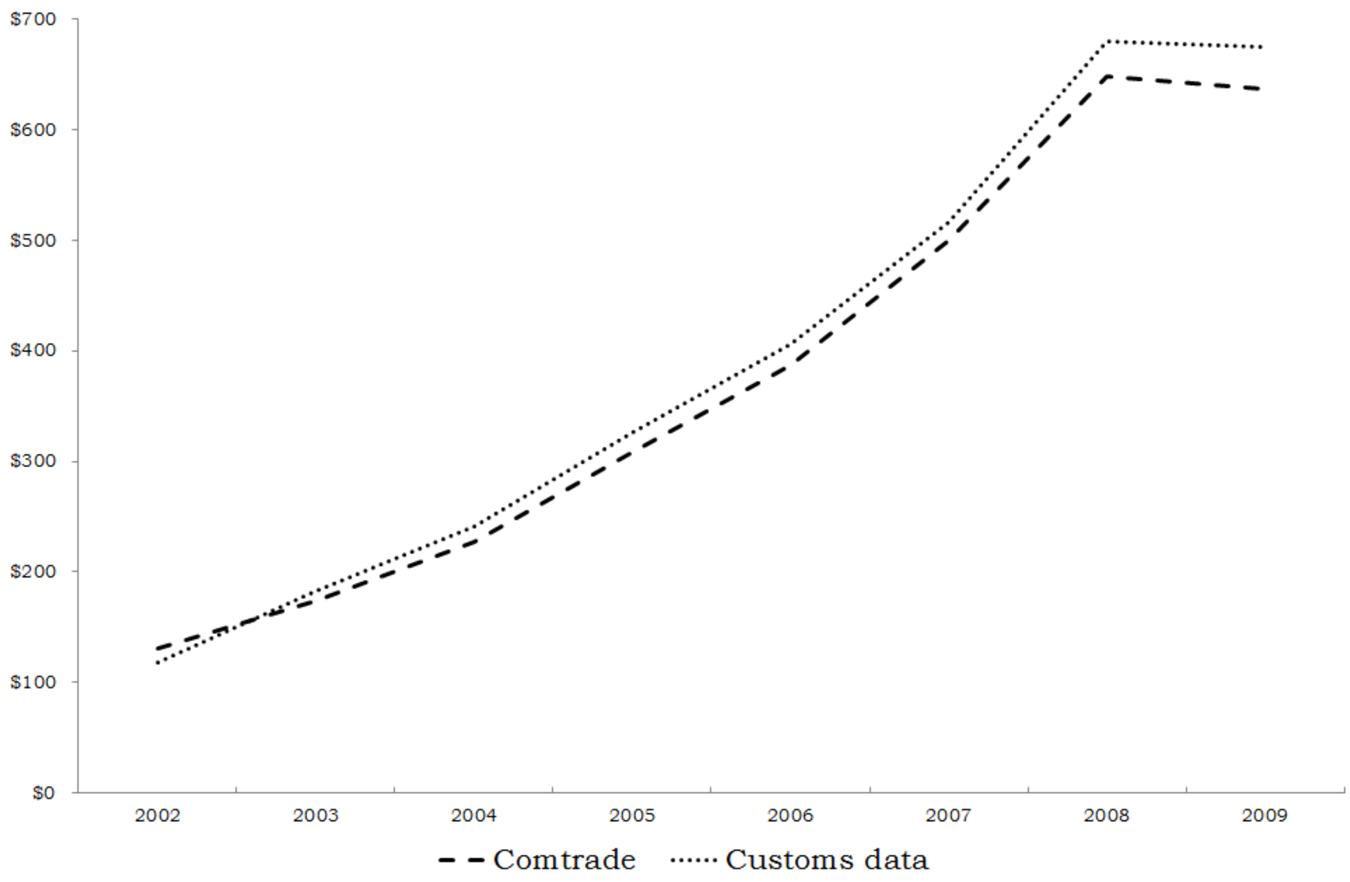

Figure 1: Argentina's Total Wine Exports (million US dollars)

Table 2: Summary Statistics on Trade Data by Year

Year	# Observations	FOB exports (USD)	# Firms	# Wines
2002	2,067	36,504,644	59	794
2003	3,056	50,664,899	73	933
2004	3,923	69,640,144	107	1,171
2005	5,330	91,261,787	120	1,517
2006	6,793	112,540,681	150	1,731
2007	7,407	131,147,970	148	1,860
2008	6,865	125,851,505	148	1,804
2009	6,135	108,177,602	151	1,833
Total	41,576	725,789,235	209	6,720

Table 3: Summary Statistics

	Observations	Min	Max	Mean	Median	Std dev
Unit values (USD/liter)	41,576	0.02	381	5.3	3.6	6.7
Number of wines exported	41,576	1	510	139	120	30
Number of destinations	41,576	1	88	40	37	23
Wine Spectator	41,576	55	97	85	85	3.8
Parker	18,892	81	98	87	87	2.4

Table 4: Top Export Destinations 2002-2009

Destinations	% of FOB exports
United States	30.8
Netherlands	10.3
United Kingdom	9.3
Brazil	7.2
Canada	6.4
Denmark	6.0
Finland	3.2
Sweden	3.2
Switzerland	2.8
Germany	2.3
France	1.8

Table 6: Snapshot of the Data

Firm	Year	Dest	Wine	Type	Grape	Vintage	Quality	Unit values (USD/liter)
Wine Spectator								
1	2006	US	A	Red	C Sauvignon	2004	76	2.75
1	2006	US	B	Red	Malbec	2003	90	11.98
1	2006	Poland	B	Red	Malbec	2003	90	15.07
Parker								
2	2008	US	C	Red	Merlot	2007	83	4.11
2	2008	US	D	Red	Malbec	2005	97	18.78
2	2008	DK	D	Red	Malbec	2005	97	10.99

Extension 1: Distribution Costs

Table 11

	(1)	(2)	(3)	(4)
Dependent variable	ln $UV^k_{ij,t}$	ln $UV^k_{ij,t}$	ln $X^k_{ij,t}$	ln $X^k_{ij,t}$
ln $q_{j,t}$	-1.176^a	-1.576^a	4.149^b	3.754^c
	(-2.81)	(-3.55)	(2.07)	(1.81)
s^k	0.037^a	0.033^a	-0.058^a	-0.063^a
	(11.43)	(10.33)	(-7.30)	(-6.89)
ln $q_{j,t} \times s^k$	–	0.005^a	–	0.005
		(3.37)		(0.88)
ln $q_{j,t} \times$ ln dc_j	2.165^b	2.116^b	-1.380	-1.426
	(2.20)	(2.16)	(-0.37)	(-0.39)
ln $Q_{j,t}$	–	–	3.569^b	3.569^b
			(2.38)	(2.38)
ln $GDP_{j,t}$	–	–	5.801^a	5.806^a
			(5.56)	(5.57)
N	19,573	19,573	19,573	19,573

Extension 2: Productivity

Table 12: Unit Values

	(1)	(2)	(3)	(4)
$\ln q_{j,t}$	-0.650^{c}	-0.773^{b}	0.116^{a}	-0.007
	(-1.88)	(-2.21)	(2.96)	(-0.11)
s^k	0.031^{a}	0.031^{a}	0.032^{a}	0.033^{a}
	(10.54)	(10.57)	(11.29)	(11.33)
$\ln q_{j,t} \times s^k$	–	0.002^{a}	–	0.002^{a}
		(2.80)		(2.69)
$\ln q_{j,t} \times sales_i$	0.274^{b}	0.273^{b}	–	–
	(2.29)	(2.28)		
$\ln q_{j,t} \times size_{i,t}$	–	–	0.012^{b}	0.011^{c}
			(1.98)	(1.78)
N	38,498	38,498	41,576	41,576

Table 12: Export Volumes

	(1)	(2)	(3)	(4)
$\ln q_{j,t}$	0.860	1.368	1.947^{a}	2.433^{a}
	(0.62)	(0.99)	(3.69)	(4.61)
s^{k}	-0.048^{a}	-0.050^{a}	-0.050^{a}	-0.051^{a}
	(-7.53)	(-7.74)	(-8.03)	(-8.23)
$\ln q_{j,t} \times s^{k}$	–	-0.006^{a}	–	-0.006^{a}
		(-3.70)		(-3.60)
$\ln q_{j,t} \times sales_{i}$	0.317	0.322	–	–
	(0.74)	(0.75)		
$\ln q_{j,t} \times size_{i,t}$	–	–	-0.012	-0.007
			(-0.77)	(-0.47)
$\ln Q_{j,t}$	0.928^{c}	0.926^{c}	0.959^{c}	0.952^{c}
	(1.67)	(1.67)	(1.77)	(1.76)
$\ln GDP_{j,t}$	-0.215	-0.186	-0.183	-0.160
	(-1.14)	(-0.99)	(-1.01)	(-0.88)
N	38,498	38,498	41,576	41,576