Online Appendix

Quality, Trade, and Exchange Rate Pass-Through*

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Abstract

We investigate theoretically and empirically the effects of real exchange rate changes on the behavior of firms exporting multiple products with heterogeneous levels of quality. Our model, which features a demand elasticity that falls with quality, predicts more pricing-to-market and a smaller response of export volumes to a real depreciation for higher quality goods. We provide strong support for the model predictions using a unique data set of Argentinean firm-level wine export values and volumes between 2002 and 2009 combined with experts wine ratings to measure quality. The heterogeneity we find in the response of export prices and volumes to changes in exchange rates remains robust to alternative measures of quality, samples, and specifications.

JEL Classification: F12, F14, F31
Keywords: Distribution costs, exchange rate pass-through, exports, heterogeneity, multi-product firms, pricing-to-market, quality, wine.

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Appendix A: Robustness

This online appendix A discusses alternative specifications we implemented to ensure the robustness of our findings. Despite some variation across specifications in the magnitude of the effect of quality on pass-through, the broad similarity of the results supports the paper's main conclusions.

Quality

To minimize noise in the measurement of quality when defined on a (50,100) scale, in column (1) of Table A1 we use a variable which takes on values between one and six, where each value corresponds to one of the different bins defined by the Wine Spectator (see Table 3 of the paper). A value of one indicates that the wine is "Not recommended," while a value of six that the wine is "Great." In column (2), in order to reduce subjectiveness in the quality scores, and to control for the fact that different tasters disagree on wine quality, we only include the wines which Wine Spectator scores belong to the same quality bin as the Parker ratings (as shown in Figure 2 of the paper, these wines belong to categories four, five, and six only). Finally, given that both the Wine Spectator and Parker are US-based ratings, and therefore may not be representative of perceived wine quality in other countries, column (3) excludes the US from the sample. Qualitatively, our results largely hold up.

Most of the empirical literature on quality and trade relies on trade unit values as a proxy for quality. We therefore check if our results remain robust to measuring quality using unit values. One advantage of this approach is that we can estimate our regressions on a much larger sample, including all wines for which the Wine Spectator ratings are missing.

First, in each year, we calculate the mean unit value (in pesos) of each wine across all destinations, and for each firm we rank its wines by unit value in decreasing order (Berman, Martin, and Mayer, 2012; Chatterjee, Dix-Carneiro, and Vichyanond, 2013; Mayer, Melitz, and Ottaviano, 2014). For each firm, the wine with the highest average unit value has a rank equal to one, the second a rank equal to two, etc., and we use these ranks as an inverted measure of quality. Second, we repeat the procedure, but for each wine exported to all destinations in all years, using the mean unit value of each wine (in pesos) deflated by the Argentinean CPI. The interactions between the exchange rate and the product ranks are expected to be negative for unit values, and positive for export volumes. The results, reported in columns (4) and (5), respectively, are consistent with expectations, and contrast with Auer and Chaney (2009) who do not find evidence that pass-through is affected by quality when quality is inferred from trade unit values.

Unrated Wines

Due to missing observations on the Wine Spectator ratings, our sample covers 43 percent of the total value of red, white, and rosé wine exported between 2002 and 2009. To include some unrated wines in the sample, we calculate an average Wine Spectator rating by wine name and type, and assign this rating to all wines with the same name and type. This increases our sample coverage to 63 percent of total exports. We apply this procedure to compute average quality both on a (50,100) and on a (1,6) scale. The results are reported in columns (6) and (7) of Table A1.

Another way to include unrated wines in the sample is as follows. First, we identify the wines which vintage year is missing, and assign to each of them the scores of the wines with the same name, grape, and type on a (1,6) scale. In general, quality does not vary much across vintage years, therefore this assumption sounds reasonable.[1] Second, we assign a value of one to the wines exported by firms that only export unrated wines (by either the Wine Spectator or Parker). We do this under the assumption that these firms produce wines which are of a too low quality to be reviewed by experts (Crozet, Head, and Mayer, 2012, assume that unrated firms are the lowest quality exporters). This exercise increases our sample coverage to 60 percent of total exports between 2002 and 2009. The results are reported in column (8) of Table A1 (the exchange rate interacted with quality is insignificant for export volumes).

Table A1: The Measurement of Quality and Unrated Wines

	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)
Panel A: Dependent variable is unit value								
$\ln RER$	0.168^{a} (0.043)	-0.253 (0.189)	0.101 (0.067)	0.153^{a} (0.033)	0.148^{a} (0.033)	0.046 (0.057)	0.166^{a} (0.035)	0.167^{a} (0.035)
$\ln RER \times quality$	0.006^{b} (0.003)	0.005^{b} (0.002)	0.002^{a} (0.000)	–	–	0.002^{a} (0.000)	0.008^{a} (0.002)	0.006^{a} (0.002)
$rank$	–	–	–	-0.009^{a} (0.001)	-0.012^{a} (0.002)	–	–	–
$\ln RER \times rank$	–	–	–	-0.001^{a} (0.000)	-0.001^{a} (0.000)	–	–	–
R-squared	0.841	0.855	0.845	0.861	0.861	0.842	0.842	0.846
Panel B: Dependent variable is export volume								
$\ln RER$	0.941 (0.608)	2.547^{c} (1.508)	1.325^{b} (0.631)	2.116^{a} (0.546)	2.223^{a} (0.545)	2.948^{a} (0.555)	2.377^{a} (0.535)	2.131^{a} (0.546)
$\ln RER \times quality$	-0.022^{b} (0.009)	-0.020^{a} (0.007)	-0.006^{a} (0.002)	–	–	-0.008^{a} (0.002)	-0.029^{a} (0.009)	-0.005 (0.008)
$rank$	–	–	–	0.069^{a} (0.013)	0.095^{a} (0.017)	–	–	–
$\ln RER \times rank$	–	–	–	0.001^{a} (0.000)	0.001^{a} (0.000)	–	–	–
$\ln REER$	0.422 (0.631)	0.337 (1.361)	0.256 (0.646)	1.690^{a} (0.559)	1.769^{a} (0.559)	1.728^{a} (0.548)	1.731^{a} (0.548)	1.583^{a} (0.562)
$\ln GDP\ per\ capita$	2.301^{a} (0.334)	2.580^{a} (0.686)	2.310^{a} (0.343)	1.923^{a} (0.276)	2.017^{a} (0.275)	1.891^{a} (0.271)	1.893^{a} (0.271)	1.976^{a} (0.280)
R-squared	0.753	0.763	0.755	0.788	0.788	0.757	0.757	0.757
Sample	Full	By bin	Ex. US	Full	Full	Mean	Mean	Unrated
Quality	WS 1-6	WS	WS	$\text{rank}_{ik,t}$	rank_{ik}	WS	WS 1-6	WS 1-6
Observations	41,576	8,982	36,714	86,882	86,882	67,589	67,589	64,302

Notes: Firm-destination and product-year fixed effects are included. Robust standard errors adjusted for clustering at the product-level are reported in parentheses. ^{a}, ^{b}, and ^{c} indicate significance at the one, five, and ten percent levels, respectively. Unit values are in pesos per liter and export volumes are in liters.

The Nature of Wine

Our results might be affected by two characteristics that are specific to the nature of wine. First, wine is an exhaustible resource: once a wine with a specific vintage year runs out, the producer can no longer produce, and therefore export, that variety. Second, the production of higher quality wines is subject to capacity constraints as the availability of high quality grapes is limited (Thornton, 2013).

[1] If wine producers conclude that the grapes grown during a particular year do not satisfy their quality standards, they may decide not to use them in order to preserve the quality and reputation of a wine (Thornton, 2013).

To control for the exhaustible nature of wine, we construct a new sample and define a product according to the name of the wine, its grape, and type, but ignore the vintage year.[2] The 209 firms in the sample export a smaller number of products (2,790 versus 6,720 wines in the original sample) to a larger number of countries (78 versus 24 destinations, on average). Quality is computed as the unweighted average of the scores assigned to all wines with the same name, type, and grape, and varies between 55 and 96.2.[3] The correlation between average quality (across vintage years) and the original quality measure (which varies across vintage years) is equal to 93.7 percent, confirming that quality does not vary much across vintage years. The results for unit values and volumes are reported in columns (1) and (2) of Table A2, respectively.

To address the issue of capacity constraints, we would need to control for total output per wine, which is unobserved. As a proxy, we rely on the total volume (in liters) of exports of each wine to all destinations between 2002 and 2009. Total exports are however endogenous to the denominator of unit values in equation (11), and to the dependent variable of equation (12) in the paper. We therefore classify wines into three categories (based on the 33^{rd} and 66^{th} percentiles of total exports), and create an indicator variable which varies between one and three, with a larger value indicating a greater volume of exports.[4] We then include this indicator, interacted with the exchange rate, in columns (3) and (4) of Table A2 for prices and quantities, respectively. Our results remain unaltered.

Table A2: The Nature of Wine

	(1)	(2)	(3)	(4)
Dependent variable	Unit value	Export volume	Unit value	Export volume
$\ln RER$	0.025 (0.067)	1.957^a (0.657)	0.077 (0.062)	1.041^c (0.616)
$\ln RER \times quality$	0.002^a (0.001)	-0.005^c (0.003)	0.001^a (0.000)	-0.004^c (0.002)
$\ln RER \times total\ exports$	–	–	-0.004 (0.003)	0.061^a (0.010)
$\ln REER$	–	1.167^c (0.636)	–	0.454 (0.631)
$\ln GDP\ per\ capita$	–	1.802^a (0.319)	–	2.312^a (0.332)
R-squared	0.808	0.735	0.842	0.754
Sample	Ex. vintage	Ex. vintage	Full	Full
Observations	44,147	44,147	41,576	41,576

Notes: Firm-destination and product-year fixed effects are included. Robust standard errors adjusted for clustering at the product-level are reported in parentheses. ^{a}, ^{b}, and ^{c} indicate significance at the one, five, and ten percent levels, respectively. Unit values are in pesos per liter and export volumes are in liters.

Exchange Rate

After the large devaluation of the peso in 2002, the peso was allowed to fluctuate with respect to the US dollar within a "crawling band that is narrower than or equal to +/-2 percent" (Reinhart and Rogoff, 2004). This means that variations in the real exchange rate between the peso and the US dollar may

[2] This exercise allows us to get closer to the CES utility function assumption of a fixed set of varieties as there is no reason for wines to run out once we exclude the vintage year.

[3] The results remain similar if quality is computed as a weighted average of the original quality scores, with weights given by the export shares of each wine to each destination country in each year.

[4] The results remain similar if we use the total volume of exports instead of the indicator variable.

have essentially come from movements in domestic prices (Li, Ma, and Xu, 2015). We verify in column (1) of Table A3 that our results still hold after excluding from the sample the US, as well as all the other countries which currencies are pegged to the US dollar.

Although the model of Section 2 in the paper derives predictions for the effects of the real exchange rate, many papers estimate pass-through regressions using the nominal rate (e.g., Gopinath, Itskhoki, and Rigobon, 2010; Gopinath and Rigobon, 2008). Column (2) includes the nominal exchange rate, its interaction with quality, and separately controls for the destination country's CPI.

Table A3: Exchange Rate

	(1)	(2)
Panel A: Dependent variable is unit value		
$\ln RER$	0.117^{c} (0.070)	0.026 (0.065)
$\ln RER \times quality$	0.001^{a} (0.000)	0.002^{a} (0.000)
$\ln CPI$	–	0.277^{a} (0.062)
R-squared	0.850	0.842
Panel B: Dependent variable is export volume		
$\ln RER$	1.570^{b} (0.685)	0.827 (0.613)
$\ln RER \times quality$	-0.007^{a} (0.002)	-0.005^{b} (0.002)
$\ln REER$	0.525 (0.693)	0.349 (0.630)
$\ln GDP\ per\ capita$	2.717^{a} (0.375)	1.798^{a} (0.341)
$\ln CPI$	–	2.031^{a} (0.655)
R-squared	0.752	0.754
Sample	Ex. US dollar	Full
Exchange Rate RER	Real	Nominal
Observations	34,372	41,576

Notes: Firm-destination and product-year fixed effects are included. Robust standard errors adjusted for clustering at the product-level are reported in parentheses. ^{a}, ^{b}, and ^{c} indicate significance at the one, five, and ten percent levels, respectively. Unit values are in pesos per liter and export volumes are in liters.

Dynamics

To introduce dynamics in equations (11) and (12) of the paper, we include one lag, and then two lags, on the exchange rate and its interaction with quality. In the volumes regressions, lags on the real effective exchange rate and real GDP per capita are also included. The results are reported in columns (1) and (2) of Table A4 for the specifications with one and two lags, respectively. In both columns, the estimated coefficients are the sum of the coefficients on the contemporaneous values and the lags of each variable (Gopinath and Itskhoki, 2010; Gopinath et al., 2010).

As in Berman et al. (2012) and Chatterjee et al. (2013), we ran our main regressions in levels. Other papers focus on first differences to address non-stationarity (e.g., Gopinath et al., 2010; Gopinath and Rigobon, 2008). Despite the limited time dimension of our panel, we estimate equations (11) and (12) in first differences, and control for product-year fixed effects while the firm-destination dummy variables drop out. Given that our panel is highly unbalanced, our sample size is reduced fourfold.

The results for unit values are reported in columns (3) to (5) of Panel A. Column (3) only includes the real exchange rate. Interestingly, average pass-through for export prices remains high at 81.4 percent, which is consistent not only with our level specifications, but also with the other firm-level studies that estimate pass-through regressions either in levels (Berman et al., 2012; Chatterjee et al., 2013), or in first differences (e.g., Amiti, Itskhoki, and Konings, 2014). Column (4) shows that the exchange rate interacted with quality is positive and significant. Finally, column (5) also includes one lag on each of the explanatory variables, and reports the sum of their estimated coefficients. Our findings continue to hold. The results for export volumes in Panel B are insignificant.

Table A4: Dynamics

	(1)	(2)	(3)	(4)	(5)
Panel A: Dependent variable is unit value					
$\ln RER$	0.058 (0.062)	0.019 (0.066)	–	–	–
$\ln RER \times quality$	0.001^a (0.000)	0.001^a (0.000)	–	–	–
$\Delta \ln RER$	–	–	0.186^b (0.089)	-4.437^b (1.928)	-4.412^c (2.310)
$\Delta \ln RER \times quality$	–	–	–	0.054^b (0.023)	0.055^b (0.027)
R-squared	0.842	0.842	0.609	0.609	0.609
Panel B: Dependent variable is export volume					
$\ln RER$	1.382^b (0.632)	1.203^c (0.660)	–	–	–
$\ln RER \times quality$	-0.005^a (0.002)	-0.005^a (0.002)	–	–	–
$\ln REER$	−0.922 (0.893)	−0.940 (0.886)	–	–	–
$\ln GDP\ per\ capita$	2.702^a (0.353)	2.669^a (0.371)	–	–	–
$\Delta \ln RER$	–	–	1.204 (1.316)	−1.756 (9.339)	−8.147 (11.124)
$\Delta \ln RER \times quality$	–	–	–	0.035 (0.109)	0.116 (0.130)
$\Delta \ln REER$	–	–	−1.230 (1.447)	−1.249 (1.447)	−2.046 (1.647)
$\Delta \ln GDP\ per\ capita$	–	–	1.924^b (0.756)	1.924^b (0.756)	2.071^b (0.909)
R-squared	0.753	0.753	0.552	0.553	0.553
Lags	One	Two	None	None	One
Observations	41,576	41,576	9,991	9,991	9,991

Notes: Firm-destination and product-year fixed effects are included in (1) and (2). Product-year fixed effects are only included in (3) to (5). In (1), (2), and (5), the coefficients reported are the sum of the coefficients on the contemporaneous values and the lags of each variable. Robust standard errors adjusted for clustering at the product-level are reported in parentheses. ^{a}, ^{b}, and ^{c} indicate significance at the one, five, and ten percent levels, respectively. Unit values are in pesos per liter and export volumes are in liters.

GDP Controls

Given that markups may vary with destination market size (Melitz and Ottaviano, 2008), we check that our results remain robust to controlling for real GDP or real GDP per capita in our pass-through regressions. The results are reported in Table A5. Note that for export volumes in Panel B, the results in column (1) are the same as in column (3) of Panel B in Table 10 of the paper.

Table A5: GDP and GDP per capita

	(1)	(2)
Panel A: Dependent variable is unit value		
$\ln RER$	0.043 (0.064)	0.021 (0.065)
$\ln RER \times quality$	0.002^a (0.001)	0.002^a (0.001)
$\ln GDP\ per\ capita$	0.099 (0.073)	–
$\ln GDP$	–	0.175^a (0.067)
R-squared	0.842	0.842
Panel B: Dependent variable is export volume		
$\ln RER$	1.289^b (0.616)	1.519^b (0.617)
$\ln RER \times quality$	-0.005^b (0.002)	-0.005^b (0.002)
$\ln REER$	0.420 (0.632)	0.734 (0.634)
$\ln GDP\ per\ capita$	2.294^a (0.334)	–
$\ln GDP$	–	2.024^a (0.295)
R-squared	0.753	0.753
Observations	41,576	41,576

Notes: Firm-destination and product-year fixed effects are included. Robust standard errors adjusted for clustering at the product-level are reported in parentheses. ^{a}, ^{b}, and ^{c} indicate significance at the one, five, and ten percent levels, respectively. Unit values are in pesos per liter and export volumes are in liters.

Sample Periods

As shown in Figure 3 of the paper, Argentina has experienced two major exchange rate regime shifts during the sample period. First, after the fixed exchange rate between the Argentinean peso and the US dollar was abandoned in 2001, the peso depreciated greatly with respect to the US dollar throughout 2002. Second, with the financial crisis that started in 2008, the peso depreciated again with respect to the US dollar. In addition, the crisis might have prompted consumers to substitute towards lower quality goods (a "flight from quality," see Burstein, Eichenbaum, and Rebelo, 2005; Chen and Juvenal, 2015), and impacted the financial constraints of exporters (Strasser, 2013). Columns (1) and (2) of Table A6 restrict the sample to the post–2002 and pre–2008 periods, respectively, while column (3) focuses on the 2003–2007 period only. Our results continue to hold for unit values, but are insignificant for export volumes in columns (2) and (3).[5]

[5] Strasser (2013) shows that financially constrained firms price-to-market less than unconstrained firms. In column (2), when restricting the sample to the period before the financial crisis, the exchange rate elasticity evaluated at the mean value of quality is equal to 0.332 and is significant at the one percent level. Pass-through is therefore lower at 66.8 percent, which is consistent with Argentinean exporters becoming more financially constrained during the crisis period.

Table A6: Sample Periods

	(1)	(2)	(3)
Panel A: Dependent variable is unit value			
$\ln RER$	0.036	0.190^{b}	0.162^{b}
	(0.064)	(0.076)	(0.079)
$\ln RER \times quality$	0.002^{a}	0.002^{a}	0.002^{a}
	(0.000)	(0.000)	(0.000)
R-squared	0.845	0.847	0.852
Panel B: Dependent variable is export volume			
$\ln RER$	1.845^{b}	0.555	1.780^{c}
	(0.781)	(0.695)	(1.032)
$\ln RER \times quality$	-0.005^{b}	-0.003	-0.002
	(0.002)	(0.002)	(0.002)
$\ln REER$	1.031	-0.193	1.202
	(0.793)	(0.720)	(1.057)
$\ln GDP\ per\ capita$	2.178^{a}	1.442^{a}	1.328^{b}
	(0.356)	(0.499)	(0.567)
R-squared	0.754	0.766	0.768
Sample	2003–2009	2002–2007	2003–2007
Observations	39,509	28,576	26,509

Notes: Firm-destination and product-year fixed effects are included. Robust standard errors adjusted for clustering at the product-level are reported in parentheses. ^{a}, ^{b}, and ^{c} indicate significance at the one, five, and ten percent levels, respectively. Unit values are in pesos per liter and export volumes are in liters.

Specifications

As both quality and pass-through may vary independently from each other over time, we need to ensure that the negative relationship that we find is not due to pass-through being low when quality is high for unrelated reasons. Therefore, column (1) of Table A7 interacts the exchange rate with year dummies. Column (2) replaces the firm-destination fixed effects by firm-destination-year dummies to control for excluded characteristics that vary by firm-destination-year (such as the time-varying demand of a country for a firm's exports, or the presence of long term contracts between exporters and importers in each destination country). The exchange rate drops out, but the interaction between the exchange rate and quality remains significant and positive for unit values, and negative for export volumes.

Quarterly Frequency

We check in column (3) of Table A7 that our results remain robust to higher frequency sampling. We estimate equations (11) and (12) of the paper using unit values, export volumes, and the real exchange rate defined at a quarterly frequency, and replace the product-year fixed effects by product-quarter dummy variables. Due to data limitations, the real GDPs per capita and real effective exchange rates are measured annually. Our results continue to hold for unit values, but are insignificant for export volumes.

Extensive Margin

Campos (2010) argues that the intensive and extensive margins of adjustment have opposite effects on pass-through. On the one hand, a depreciation reduces the average price charged by existing exporters. On the other hand, a depreciation makes exporting a more profitable activity, therefore more firms enter the export market. Given that entrants are less productive and therefore charge higher prices, the extensive margin pushes the average export price up, reducing pass-through. We therefore estimate equations (11) and (12) of the paper on a sample that captures the intensive margin, and only includes the firms exporting in all years to any destination (column 4 of Table A7), or the firms exporting to each destination in all years (column 5).[6]

Wholesalers and Retailers

We have restricted our analysis to wine producers. Column (6) of Table A7 shows that our results still hold when including wholesalers and retailers in the sample.

Table A7: Robustness

	(1)	(2)	(3)	(4)	(5)	(6)	(7)
Panel A: Dependent variable is unit value							
$\ln RER$	–	–	0.014	0.076	0.020	0.059	0.041
			(0.054)	(0.061)	(0.084)	(0.062)	(0.061)
$\ln RER \times quality$	0.002^{a}	0.002^{a}	0.001^{b}	0.002^{a}	0.002^{a}	0.001^{a}	0.002^{a}
	(0.000)	(0.000)	(0.000)	(0.000)	(0.001)	(0.000)	(0.000)
R-squared	0.842	0.897	0.879	0.831	0.838	0.842	0.841
Panel B: Dependent variable is export volume							
$\ln RER$	–	–	0.918^{a}	0.953	1.313	1.296^{b}	–
			(0.328)	(0.603)	(0.921)	(0.616)	
$\ln RER \times quality$	-0.005^{b}	-0.004^{b}	-0.003	-0.005^{b}	0.002	-0.005^{b}	–
	(0.002)	(0.002)	(0.002)	(0.002)	(0.003)	(0.002)	
$\ln REER$	0.437	–	0.334	0.037	1.096	0.426	–
	(0.642)		(0.344)	(0.621)	(0.901)	(0.632)	
$\ln GDP\ per\ capita$	1.943^{a}	–	2.150^{a}	2.316^{a}	3.415^{a}	2.291^{a}	–
	(0.332)		(0.363)	(0.332)	(0.627)	(0.335)	
R-squared	0.753	0.828	0.781	0.717	0.671	0.753	–
Sample	Full	Full	Quarterly	Intensive$_i$	Intensive$_{ij}$	All firms	Full
Unit values	Pesos	Pesos	Pesos	Pesos	Pesos	Pesos	USD
Firm-dest-year FE	No	Yes	No	No	No	No	No
Observations	41,576	41,576	58,016	35,594	16,452	41,632	41,576

Notes: Firm-destination and product-year fixed effects are included in (1) and (3)–(7). In (2), firm-destination-year fixed effects are further included. In (3), the product-year fixed effects are replaced by product-quarter dummy variables. In (1), the real exchange rate is interacted with year dummies (not reported). Robust standard errors adjusted for clustering at the product-level are reported in parentheses. ^{a}, ^{b}, and ^{c} indicate significance at the one, five, and ten percent levels, respectively.

Currency of Invoicing

A large body of the recent literature is devoted to understanding how the currency of invoicing used for trade affects exchange rate pass-through (e.g., Gopinath et al., 2010). In our data set, we do not observe the currency in which Argentinean firms price their exports. The Datamyne, a private vendor of international trade data, provides us with the invoicing currency of firm-level exports between 2005 and 2008. Over the period, Argentinean firms priced wine exports mostly in US dollars (88 percent), followed by euros (7.6 percent), Canadian dollars (3 percent), pound sterling (1.2 percent), and in some

[6] In response to an exchange rate change, firms can also alter the composition of their exports as well as the number of products they sell abroad (Berman, Martin, and Mayer, 2012; Chatterjee, Dix-Carneiro, and Vichyanond, 2013; Mayer, Melitz, and Ottaviano, 2014). We checked, and confirm, that in response to a real depreciation, firms increase the number of products exported and reduce their share of higher quality versus lower quality exports.

cases in Japanese yen, Swiss francs, Uruguayan pesos, Australian dollars, or Danish krones. Due to the predominance of the US dollar as an invoicing currency for exports, the regression in column (7) of Table A7 expresses unit values in US dollars per liter.

Appendix B: First-Stage IV Regressions

The first-stage estimates of the IV regressions reported in column (4) of Panels A and B of Table 15 in the paper are reported in Table B1 below.

Table B1: First-Stage Instrumental Variables Regression

	(1)
Temperature September $\times \ln RER$	0.379^{b} (0.172)
Temperature October $\times \ln RER$	−0.048 (0.099)
Temperature November $\times \ln RER$	0.655^{a} (0.239)
Temperature December $\times \ln RER$	−0.125 (0.185)
Temperature January $\times \ln RER$	−0.252 (0.179)
Temperature February $\times \ln RER$	0.396^{b} (0.198)
Temperature March $\times \ln RER$	−0.170 (0.173)
Rainfall September $\times \ln RER$	−0.012 (0.012)
Rainfall October $\times \ln RER$	0.024^{a} (0.005)
Rainfall November $\times \ln RER$	0.000 (0.006)
Rainfall December $\times \ln RER$	0.011^{c} (0.006)
Rainfall January $\times \ln RER$	0.003 (0.002)
Rainfall February $\times \ln RER$	−0.010 (0.006)
Rainfall March $\times \ln RER$	-0.015^{a} (0.004)
Altitude $\times \ln RER$	0.001 (0.003)
Observations	37,723

Notes: The dependent variable is $\ln RER \times quality$. Firm-destination and product-year fixed effects are included. Robust standard errors adjusted for clustering at the product-level are reported in parentheses. [a], [b], and [c] indicate significance at the one, five, and ten percent levels, respectively.

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