Wholesale Price Discrimination in Global Sourcing

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Previous research has found price discrimination in business-to-consumer (B2C) markets, where buyers are end customers. There is limited research on suppliers' price-quoting behaviors and price discrimination in business-to-business (B2B) markets. It is unclear whether certain characteristics of B2B buyers, who are often representatives of firms and not end customers, would influence suppliers' pricing decisions. In this research, we study wholesale price discrimination by collaborating with a global trading company that runs a field experiment on a global sourcing marketplace. We find that there is no significant difference in the wholesale prices quoted to buyers selling in US and South African markets. We also find that suppliers quote significantly higher wholesale prices to White buyers than to Asian and Black buyers, regardless of country. However, price discrimination disappears when buyers present market information to suppliers, providing the lowest wholesale price offered by other suppliers in the market, whereas price discrimination remains when buyers present social information to suppliers, thereby indicating the buyer is referred by a previous customer. In addition, we show that market information can help buyers obtain a lower wholesale price because it signals a lower willingness to pay. Social information, however, can reduce price quotes for only Black and White buyers, but not for Asian (particularly Chinese) buyers.

Key words: Wholesale price, B2B marketplace, global sourcing, market information, social information

1. Introduction

Since the late 1980s, companies worldwide have been implementing global sourcing to procure goods and services across geopolitical boundaries. This practice aims to exploit global efficiency by buying from countries with low-cost skilled labor and cheap raw materials. Imports and exports account for a large percentage of the gross domestic product (GDP) of countries worldwide. For example, in 2016, imports to the US and South Africa accounted for 14.7% and 30.1% of their GDPs, respectively, and exports accounted for 19.7% of China's GDP (World Bank 2018).

In global sourcing, the wholesale price charged by an upstream exporter (the supplier) to a downstream importer—such as a retailer, wholesaler, or trade agent (the buyer)—is a key determinant

of each supply chain member's profits. In this paper, *buyer* specifically refers to the individual procurement manager who represents the buying company. Despite its importance, wholesale pricing in B2B transactions has not been well studied in empirical literature, primarily because wholesale prices are private information between suppliers and retailers. Current research has largely inferred wholesale prices using retail-price data from B2C markets, which is often publicly accessible.

B2B pricing and buying decisions differ from those of B2C markets in terms of customer type (retailer vs. end consumer), order quantity (large vs. small), customer relationship (long-term vs. short-term), price (negotiable vs. fixed), and decision type (planned and rational vs. impulsive and emotional). Consequently, B2B buyers spend significant efforts to research the market prior to purchasing. Given that pricing and buying decisions are fundamentally different from the retail context and that the B2B market is double the size of the B2C market in both domestic and global markets (Forrester 2015, Hanover Research 2018), it is important to empirically study wholesale pricing strategies in B2B markets (Cachon 2003, Cachon and Netessine 2006).

In practice, since a supplier is motivated to optimally set the price to maximize his profit, he may tailor the price to buyers of different races or selling countries. Such price discrimination has been identified in various B2C markets (Yinger 1986, Ayres and Siegelman 1995). However, it is not clear if the same phenomenon and mechanisms hold in a B2B context. This is because B2C buyers are end customers whose characteristics directly reflect their ability and willingness to pay for the product, whereas B2B buyers are often procurement managers that acquire products for firms who will then sell to end consumers. That is, the innate characteristics of B2B buyers may neither represent their firms nor resemble their end customers; consequently, the same price discrimination against buyers' innate characteristics as in the B2C context might not hold.

Wholesale price discrimination has been shown to potentially hurt social welfare (Katz 1987, DeGraba 1990) and is, therefore, banned by competition laws in many countries. Apart from its legal implications, wholesale price discrimination behavior can create an unfair trading environment that repels buyers, which will in turn lead to a loss of suppliers due to the network effect.

In this paper, we explore how suppliers' wholesale pricing depends on the buyer's country and race in an online B2B global-sourcing platform. We further study the impact of information strategies—presenting the lowest market price information to suppliers or indicating that the buyer has been referred by previous customers—on suppliers' price quoting and potential price discrimination.

In particular, we study wholesale price discrimination in two countries (the US and South Africa) and the effects of the market in which the buying company sells and the procurement managers' race on pricing. These two countries are large importers—the US is the largest importer in the world and South Africa is the largest importer in Africa (Central Intelligence Agency 2018)—and

both are multiracial countries. In addition, both countries have significant inequality in terms of economics, income, and wealth—with the US being a developed country and South Africa being a developing and emerging country—which can be key determinants for suppliers' pricing decisions.

Online B2B platforms essentially serve as information brokers through whom buyers search, compare, and connect to suppliers, quote and negotiate prices with suppliers, and finalize transactions. It has been shown that information plays an important role in pricing outcomes (Stigler 1961, Valley et al. 1992). Therefore, we explore how information strategies influence wholesale pricing and potential discrimination in B2B transactions. Unlike B2C buyers, B2B buyers spend more time researching the product in the purchasing process. Surveys on B2B markets show that buyers spend a significant amount of effort collecting information from the market or peers.

> *Given today's long and winding purchase process—and the sheer amount of research involved—it should come as no surprise that more buyers are turning to trusted sources for advice when choosing between vendors. [...] Almost half (49%) listed their peers and colleagues as a top source of information [...].*
>
> —Demand Gen Report B2B Buyer's Survey (2016, p.11).

This motivates us to investigate the impact of a buyer's market information—providing suppliers the lowest wholesale price offered by other suppliers in the market—and social information—indicating that a buyer is referred by a peer—on suppliers' price quoting behavior.

To this end, we collaborate with a global trading company that operates and runs a field experiment on Alibaba.com (Alibaba)—the world's largest online global-sourcing platform. As a canonical platform, Alibaba serves millions of international buyers and suppliers from 190 countries. The trading company's procurement managers from different countries (the US and South Africa) and races (Asian, Black, and White) quote prices from suppliers on Alibaba. Asian, Black, and White refer to descendants of Asia, Africa, and Europe, respectively. Specifically, we study Chinese, African, and White buyers in the US and South Africa. We customize the quoting messages to signal market or social information with four information conditions: no information, market information only, social information only, and both market and social information. We compare suppliers' quoted wholesale prices for buyers from two countries and three races under these four information conditions.

We find that wholesale prices quoted to buyers selling to the US and South African markets are not significantly different. This indicates that there is no wholesale price discrimination based on country in our context, which could be due to the fact that retail prices and the resulting willingness-to-pay of the studied products are similar in both countries.

Further, we find that quoted wholesale prices vary based on the social status of procurement managers. Specifically, in both countries, suppliers quote a significantly higher wholesale price to

White buyers than to Black and Asian buyers. Intuitively, the supplier decides the wholesale price based on his perception of the buyer's willingness-to-pay. A perception of a higher willingness-to-pay would lead to the quotation of a higher wholesale price. The pricing decision could also depend on the willingness-to-pay of a buyer's end-customers. According to the similarity-attraction theory (Byrne 1997, Kaptein et al. 2014), suppliers tend to believe that procurement managers would develop a buyer-seller relationship with people of the same race (Thomas 1990, Smith 1998). Therefore, suppliers expect a White buyer's downstream customers to have a similar ethnicity and willingness-to-pay. Consequently, suppliers charge a higher wholesale price to White procurement managers than others.

We also find that market information and social information can significantly reduce the wholesale price offered by suppliers. That is, when buyers present a market price or a social connection with suppliers, they can obtain a lower price quote. This is because the supplier is uncertain about the buyer's exact willingness-to-pay and relies on available information to infer it. Thus, the market and social information provided by a buyer signal his *reference price*. To be specific, market information explicitly entails the market price offered by competitive suppliers, and social information implicitly signals the historical price offered to previous buyers. Consequently, information can update suppliers' beliefs regarding buyers' willingness-to-pay, anchoring the wholesale price they offer.

In particular, market information unanimously reduces wholesale prices for buyers of any race. Social information, however, can reduce the price quote for only Black and White buyers but not for Asian (specifically Chinese) buyers. Whether a supplier reacts to the social information, which is often private and unverifiable, depends on the supplier's perception of the buyer's trustworthiness (Özer et al. 2011, Gu and Zhu 2018). Given that over 97% of Alibaba suppliers are from China, one possible explanation of this result is the distrust between Chinese suppliers and buyers—that is, Chinese suppliers trust non-Chinese buyers more than they trust Chinese buyers (Bond 1986, Özer et al. 2014). We confirm this intuition by conducting a survey with 38 respondents who are Chinese suppliers experienced in global trading. In the survey, we ask them to read a price quoting message where social information and the buyer's name and professional photo are presented. We designed two versions of the questionnaire where the message was sent by a Chinese and a non-Chinese buyer, respectively. We randomly distributed one of two versions to each supplier and asked them to measure how much they trust the social information in the message. We find that suppliers ascribe a significantly lower trust score to social information when it is provided by Chinese buyers.

Our results provide a managerial prescription of how to reduce wholesale price discrimination. We show that market information is effective in reducing such discrimination. This is because market information directly signals the product price in the market, which serves as an explicit

buyer-independent reference price that suppliers use as an anchor regardless of the buyers' race. However, we find that social information fails to reduce wholesale price discrimination. Social information signals a buyer-dependent reference price, which depends on the buyers' race. Because suppliers tend to believe that buyers are referred by peer buyers of the same race, suppliers anchor to the price offered to a certain racial group and, thus, the discrimination remains.

2. Literature Review

Our work is related to one of the central topics of supply chain management: wholesale price (DeGraba 1990, Cachon 2003). In supply chains, the wholesale price that suppliers charge for downstream buyers is an important determinant of suppliers' profit margins and buyers' prices, which in turn impact profitability. There are two schemes for wholesale pricing: uniform and buyer-specific. In a uniform scheme, the supplier charges an identical wholesale price to all retailers in the market. In a buyer-specific scheme, however, the supplier charges different prices to retailers based on, for instance, order quantity (Zhang et al. 2016), buyer intermediation (Tunca and Zhu 2017), or race (Graddy 1995). Buyer-specific wholesale pricing has been shown to help suppliers optimize profits (DeGraba 1990) and achieve supply chain coordination (Cachon 2003). This literature lacks empirical evidence primarily due to the difficulty in accessing confidential data on wholesale price (Phillips et al. 2015). Our work empirically investigates the existence of buyer-specific pricing, and if so, how to reduce such price discrimination in global trading, which could advance our understanding of profit allocations across supply chain members.

Global sourcing has become a common strategy adopted by numerous companies. The literature has theoretically investigated topics including facility networks and dual sourcing (Cohen and Huchzermeier 1999, Lu and Van Mieghem 2009, Allon and Van Mieghem 2010). Our paper follows the recent interest in empirically quantifying operations strategies arising in global procurement. For example, a recent but influential paper by Jain et al. (2013) analyzes firm-level bill of lading data and shows that an increase in global sourcing leads to an increase in inventory investment. Short et al. (2016) show the importance of auditing suppliers' conduct in mitigating reputational risk and information asymmetry in global supply chains. Wang et al. (2018) study the impact of sub-tier network structures on global high-tech supply chains. We complement this literature by investigating how suppliers set their wholesale prices to different buyers on a global trading platform, and by offering platform suggestions on how to reduce such discrimination.

Our work is also related to the stream of literature on price discrimination. This stream of work mainly studies B2C settings and aims to understand whether certain groups of customers—for example, those of different origins, genders, or race—are able to obtain a lower price than others (Ayres and Siegelman 1995, Castillo et al. 2013, Busse et al. 2017). Suppliers determine their price

based on a belief of the buyer's willingness-to-pay. Buyers are likely to receive a higher price when they signal a higher willingness-to-pay. We extend the scope and theory of this literature to a B2B marketplace. A key differentiator for a B2B setting is that, unlike a B2C setting where buyers are the ones who make the purchase, B2B buyers are often representatives of firms. One would expect that representatives' race would not influence suppliers' price quotes. However, our findings show that racial prejudice is so deep that it extends beyond an individual to the company he represents.

Information sharing has been shown to reduce supply chain inefficiency by, for example, improving inventory and capacity management (Lee et al. 2000, Cachon and Lariviere 2001), reduce the bullwhip effect (Lee et al. 1997), and increase forecast accuracy (Gaur et al. 2005, Cui et al. 2015). We complement this literature by empirically studying two types of information—market and social information—and finding that both types can reduce the price quote—that is, information sharing can help mitigate double marginalization, a cause of supply chain inefficiency. We also contribute to the literature on trust and trustworthiness in supply chains. In particular, we find that market information reduces the quoted price for buyers of difference races, whereas social information does so only for Black and White buyers but not for Chinese buyers. This echoes the lab experimental findings by Özer et al. (2014) that Chinese suppliers exhibit higher trust toward US retailers than Chinese retailers.

3. Research Hypotheses

We study how suppliers quote their wholesale prices to buyers—usually procurement managers of buying companies—on an online global trade platform, Alibaba.com, where "buyers, who are located in more than 190 countries, are typically trade agents, wholesalers, retailers, manufacturers and SMEs engaged in the import and export business" (Alibaba 2018). Before buying a product, buyers would research its market price by asking for price quotes from suppliers. Suppliers then provide a price quote to buyers based on buyers' characteristics and the inquiry request.

Next, we develop hypotheses based on the literature on supply chain and price discrimination. We discuss potential mechanisms behind price quoting and wholesale price discrimination, and we propose ways to reduce this discrimination.

3.1. Wholesale Price Discrimination

A unique feature of B2B markets compared to B2C markets is that buyers are not end customers; they sell purchased products to end customers. When a supplier decides on a wholesale price to charge buyers in a B2B setting, the key decision factor is the willingness-to-pay of the buyers' end consumers. Economic theory suggests that buyers with a higher willingness-to-pay will be charged a higher price (Ayres and Siegelman 1995, Castillo et al. 2013, Phillips et al. 2015). Thus, the

higher the end consumers' willingness-to-pay, the higher the wholesale price that suppliers will charge.

End consumers' willingness-to-pay can vary across countries. For example, consumers from countries with different wealth levels may have a different willingness-to-pay. Willingness-to-pay for the same product may be lower to those of average wealth than to the rich (Pratt and Zeckhauser 1996, Priem 2007). Therefore, because the US has a higher average income than South Africa, US consumers tend to have a higher willingness-to-pay than South African consumers. Consequently, suppliers will charge a higher price to US buyers.

HYPOTHESIS 1 **(Country)**. *Wholesale price discrimination based on a buyer's country exists in global trading. US buyers will receive a higher price quote than South African buyers.*

End consumers' willingness-to-pay can also vary based on their race (Bergstrom et al. 1982). The literature has documented that, in general, White consumers in B2C markets have a higher willingness-to-pay than other consumers (Ayres and Siegelman 1995). In addition, the theory of similarity-attraction (Byrne 1971, Kaptein et al. 2014) indicates that managers tend to develop a buyer-seller relationship with people of the same race (Thomas 1990, Smith 1998). In our context, a supplier would expect that the buyer will target or be patronized by consumers of the same race. Consequently, the supplier expects that White buyers have a higher willingness-to-pay and, therefore, charge them a higher price than Asian or Black buyers.

HYPOTHESIS 2 **(Race)**. *Wholesale price discrimination exists in global trading based on a buyer's race. White buyers will receive a higher price quote than non-White buyers.*

3.2. Impact of Information on Price and Discrimination

The supplier attempts to infer a buyer's willingness-to-pay based on available but often limited information about the buyer. Information can help update the supplier's belief and alter the offered wholesale price accordingly. We explore the effects of market information (communicating the lowest wholesale price offered by other suppliers in the market) and social information (indicating that the buyer is referred by a previous customer) on suppliers' price quotes.

Market and social information can be the key determinants for suppliers when quoting the price. Both types of information can generate a *reference price point* based on which the supplier determines the price quote. Reference prices are benchmarks against which the purchase of a product is judged (Kahneman 1992, Mazumdar et al. 2005). Market information signals the price offered by competing firms, while social information signals a connection that the buyer has with a previous buyer; for example, the buyer may know the historical price paid by the previous buyer (Mezias et al. 2002).

The reference price is particularly influential in B2B transactions. Previous B2B pricing research (Bruno et al. 2012, Elmaghraby et al. 2015, and Pilehvar et al. 2016) finds that the reference price affects the pricing outcome in B2B market transactions. In our context, market information contains the lowest market price found by the buyer, and social information implies knowledge of the historical price offered to a previous buyer. That is, market information explicitly mentions—whereas social information implicitly hints at—a reference price based on which the supplier determines the wholesale price to quote. Consequently, both market and social information can update the supplier's belief on the buyer's willingness-to-pay, and the wholesale price quote will be anchored to the reference price signaled through the information. We hypothesize that market information and social information can reduce the wholesale price quote.

HYPOTHESIS 3 **(Price Reduction)**. (*a*) *Market information can reduce the wholesale price quoted by suppliers in global trading.* (*b*) *Social information can also reduce the wholesale price quoted by suppliers in global trading.*

The impact of market and social information on the wholesale price may vary across buyers of different races. In particular, market price is a piece of information that can be verified and, therefore, has a strong signal strength. Suppliers' decisions would rely more on market information than the information signaled by race. Consequently, market information can reduce the wholesale price quoted by buyers of any race.

Whether the supplier reacts to social information depends on the supplier's perception of the buyer's trustworthiness (Gu and Zhu 2018). Previous research has shown that Chinese suppliers perceive Chinese buyers to be less trustworthy than other buyers (Özer et al. 2014). Therefore, because over 97% of Alibaba suppliers are from China, we hypothesize that social information can reduce the wholesale price quote for Black and White buyers but not for Asian (Chinese) buyers.

HYPOTHESIS 4 **(Price Reduction based on Race)**. (*a*) *Market information can reduce the wholesale price quote for buyers of different races in global trading.* (*b*) *Social information can only reduce the wholesale price quote for non-Asian* (*non-Chinese*) *buyers on Alibaba.*

Market and social information may affect wholesale price discrimination differently. Market information directly signals the product price in the market, which serves as an explicit buyer-independent reference price. Consequently, market information can reduce price discrimination for all buyers regardless of their race or country.

Social information, however, indirectly signals the historical price charged or quoted to a previous buyer, serving as a buyer-dependent reference price. A previous buyer's historical price can depend on his race (see Hypothesis 2). In particular, a White peer buyer may have received a higher price

than a non-White buyer. According to the similarity-attraction theory, the supplier tends to believe that a buyer is referred by a peer buyer of the same race, so the supplier's wholesale price anchors to a buyer-dependent reference price based on the racial group that the buyer belongs to. We thus hypothesize that social information cannot mitigate wholesale price discrimination.

HYPOTHESIS 5 **(Discrimination Reduction)**. (*a*) *Market information can reduce wholesale price discrimination in global trading.* (*b*) *Social information cannot reduce wholesale price discrimination in global trading.*

4. Research Context

Founded in 1999, Alibaba is the largest online B2B trading platform in the world that facilitates efficient and reliable trade between millions of buyers and suppliers worldwide (Lesonsky 2018). The platform is open only for international trading and not domestic trading. Suppliers provide hundreds of millions of products in over 40 major categories, including apparel, household sundries, and machinery. Approximately 97.6% of the suppliers are manufacturers or dealers in mainland China, and the remainder are located in Taiwan, Hong Kong, and other regions worldwide (Alibaba 2016). Buyers are located in over 190 countries, and they exchange more than 100,000 messages with suppliers on the platform every day.

4.1. Selling on Alibaba

On Alibaba, a supplier introduces his company on a profile page and lists product specifications and previous transaction summary on a product page. A supplier's profile page includes company information (e.g., name, location, size, and product category), capabilities (e.g., historical revenue in different regions, manufacturing capacity, and quality control certificates), and performance on the platform (e.g., response rate, ratings, and transaction volume), which can help buyers choose reliable suppliers. Suppliers can pay to become gold suppliers—a premium membership on Alibaba that grants members advantages in product promotion and exposure. Most suppliers are gold members. Figure 4 in the appendix presents an example of a supplier's product page where product information is listed on the left and supplier characteristics are displayed on the right. The product page displays product characteristics—for example, description, picture, price, and color—and transaction details—for example, shipping fee, lead time, customization, and payment method. Specifically, the supplier sets the wholesale price and the corresponding minimum order quantity.

4.2. Buying on Alibaba

A buyer also creates a personal profile that includes the buyer's name, photo, company name, country, and Alibaba-certified contact information (i.e., phone number, and email address). Buyers

can search for a specific product and the platform displays a list of suppliers to choose from. The buyer can then view product details and contact the supplier, as depicted in Figure 4. When receiving an inquiry from a buyer, the supplier chooses whether to read and follow up with the inquiry. The buyer can see the status of the inquiry, for example, whether the message has been read by the supplier. After the transaction details have been settled, the buyer pays the supplier, the supplier delivers the order, and the transaction is completed.

5. Identification Strategy

Our paper studies suppliers' wholesale price discrimination based on buyers' countries (i.e., selling markets), races, and any market and social information that might mitigate the discrimination. Aiming to understand suppliers' pricing behaviors, a global trading company which operates on Alibaba collaborates with us to conduct a field experiment.

5.1. Study Design

The global trading company sells in both US and South Africa markets. The company has multiple procurement representatives, whose routine job is to keep track of market dynamics by collecting wholesale price information. In our study, the procurement representatives follow our scripts and guidelines when quoting wholesale prices from suppliers. Our study tests suppliers' responses to buyers from two countries (the US and South Africa) belonging to three races (identified as Asian, Black, and White in this study) under four information conditions (no information, market information only, social information only, and both market and social information)—that is, a $2\times3\times4$ experiment design.

The trading company asks for price quotes via 12 buying representatives—two Chinese, two African American, and two White buyers serving the US market, and two Chinese, two African, and two White buyers serving the South African market. Buyers contact suppliers on Alibaba to request a price quote. We tailor the message to incorporate market and social information in the latter three information conditions. Each buyer sends messages regarding four information conditions. We then record and compare suppliers' responses. Table 1 summarizes the study design. Our study was conducted after being approved by the Institutional Review Board and registered on SocialScienceRegistry.org.

We select a sample of 3,840 products from 3,840 suppliers selling in the computer accessories sector.[1] Computer accessories have a relatively standard quality and a large number of suppliers.

[1] The sample size is determined by the statistics power calculation. By running a pilot experiment with 50 White buyers, 50 Black buyers, and 50 Asian buyers under the no information, market information, and social information conditions in the US and South Africa, respectively, we compare the price discounts across treatment arms and obtain their effect size. Based on a two-sided t-test with a power level of 0.8 and a significance level of 0.05, we need 79 observations with a 0.45 effect size between White and Black buyers under the no information condition,

Table 1 Study Design

Design	Country × Race × Information							
Buyers	USA	White Buyer	Black Buyer	Asian Buyer	RSA	White Buyer	Black Buyer	Asian Buyer
	No Info	2 Buyers	2 Buyers	2 Buyers	No Info	2 Buyers	2 Buyers	2 Buyers
	Market Info				Market Info			
	Social Info				Social Info			
	Both Info				Both Info			
Experiment Date	July 29, 2018 to August 30, 2018							
Product Category	Computer accessories (i.e., flash drive, hard disk, network card, keyboard, mouse, mouse pad, USB splitter) and electronic devices (i.e., memory card, headset, bluetooth speaker, power bank, modem, wifi extender, wireless presenter)							

Note: The difference between the planned sample size and the actual sample size is due to suppliers' unavailability. Product pages can become unavailable for unexpected reasons, for instance, they could fail to function properly when the price inquiry was about to be sent. In particular, the planned sample size was 3,840, that is, 160 suppliers per treatment arm. After excluding unavailable listings, buyers sent requests to 3,716 listings, which is the actual sample size.

Moreover, electronic equipment is the top export category in China.[2] In our sample, there are 21 product subcategories including, for example, flash drive, hard disk, keyboard, and memory card.[3] Products within the same category vary mainly according to their brands. Each supplier usually offers a wide selection of models for a product with different features, for example, flash drives with storage capacities of 8, 16, or 32 GB and case material of plastic or metal. From each supplier's listed products, we select a product model that is the most common and standard in the market. Suppliers are randomly assigned to one of the 24 (2×3×4) treatment arms. Consequently, we have 1,920 suppliers per country, 1,280 suppliers per race, 960 suppliers per information condition, and 160 suppliers per treatment arm.

In order to ensure that suppliers are randomly assigned to treatment arms, we check the randomization across supplier characteristics measured by nine variables prior to the experiment: (1) response rate over the last 30 days; (2) gold supplier status (i.e., the number of years a supplier has had a premium membership on Alibaba); (3) transaction level (i.e., the accumulated score awarded for a supplier's total transaction volume on Alibaba; the greater the transaction volume, the higher the score awarded); (4) number of transactions in the past six months; (5) listed price of the chosen product; (6) number of reviews on the supplier's profile page; (7) review rating based on three dimensions: supplier service, on-time shipment, and product quality; (8) percentage of the supplier's revenue in North America relative to its total revenue; and (9) percentage of the

90 observations with a 0.42 effect size between White and Asian buyers under the no information condition, 110 observations with a 0.38 effect size between the no and market information conditions, and 130 observations with a 0.35 effect size between the no and social information conditions. We determined the sample size per treatment arm to be 160 (>130) to further ensure the validity of the experiment.

[2] `https://tradingeconomics.com/china/exports-by-category`

[3] In order to explore new markets, the trading company specifies these 21 product categories from which our research team independently selects the supplier and product sample. We validate with the company that there is no previous supplier in the sample.

supplier's revenue in Africa relative to its total revenue.[4] Table 2 presents the summary statistics for these variables across country and race. In order to show that there is no systematic difference in suppliers' characteristics across treatments, we conduct t-tests over the values of the seven variables prior to the treatment. The randomization checks are presented in Table 3.

Table 2 Summary Statistics

		United States	South Africa	United States			South Africa		
				Black (B)	White (W)	Asian (A)	Black (B)	White (W)	Asian (A)
Response Rate (%)	Mean	79.52	79.76	79.43	79.44	79.70	79.96	79.81	79.53
	Std	20.33	19.62	20.61	19.96	20.45	19.45	19.44	20.01
Gold Supplier (years)	Mean	4.55	4.53	4.51	4.58	4.57	4.64	4.49	4.45
	Std	3.23	3.19	3.21	3.24	3.24	3.18	3.25	3.14
Transaction Level	Mean	2.09	2.08	2.07	2.09	2.10	2.10	2.08	2.07
	Std	0.88	0.88	0.89	0.89	0.87	0.89	0.85	0.89
No. of Transactions	Mean	28.06	28.78	27.94	27.30	28.96	28.14	28.84	29.37
	Std	40.19	40.27	39.41	41.19	39.99	34.34	45.78	39.85
Listed Price	Mean	7.07	7.06	7.00	7.07	7.07	7.06	7.08	7.06
	Std	4.09	4.29	4.18	4.03	4.08	4.45	4.17	4.26
No. of Reviews	Mean	7.57	7.24	7.60	7.52	7.60	7.06	7.15	7.51
	Std	12.22	16.19	12.76	11.99	11.93	10.78	23.11	11.36
Review Rating	Mean	4.68	4.68	4.68	4.65	4.70	4.70	4.66	4.69
	Std	0.51	0.50	0.49	0.52	0.52	0.46	0.54	0.50
Revenue in North America (%)	Mean	17.87	18.55	18.43	17.99	17.18	18.37	18.73	18.54
	Std	17.12	16.74	16.89	17.80	16.63	16.68	17.04	16.52
Revenue in Africa (%)	Mean	1.09	1.00	0.92	1.21	1.13	0.91	1.19	0.89
	Std	4.94	4.95	4.34	5.77	4.56	4.67	5.80	4.28
Observations		1920	1920	640	640	640	640	640	640

Table 3 Randomization Check (p-value)

	USA vs RSA	United States			South Africa		
		B vs W	B vs A	W vs A	B vs W	B vs A	W vs A
Response Rate (%)	0.71	0.99	0.81	0.82	0.88	0.69	0.80
Gold Supplier (years)	0.83	0.68	0.73	0.94	0.39	0.28	0.85
Transaction Level	0.92	0.75	0.63	0.88	0.62	0.58	0.95
No. of Transactions	0.65	0.82	0.72	0.55	0.63	0.57	0.86
Listed Price	0.96	0.98	0.98	0.95	0.94	0.99	0.95
No. of Reviews	0.58	0.93	0.99	0.93	0.94	0.57	0.78
Review Rating	0.85	0.48	0.45	0.16	0.34	0.79	0.50
Revenue in North America (%)	0.23	0.66	0.19	0.41	0.71	0.86	0.84
Revenue in Africa (%)	0.58	0.33	0.43	0.78	0.36	0.95	0.32

Note: A, B, and W represent the Asian, Black, and White buyers, respectively.

[4] To eliminate the possibility that suppliers may customize pricing strategies based on their different regional market shares, we collect each supplier's revenue percentage in the top-three trade markets displayed on Alibaba. By showing that suppliers with different focal markets are randomly assigned across treatments, we can ensure that the treatment effects are independent of suppliers' regional objectives. Because not all suppliers have North America or Africa as their top-three markets, our data may have missing revenue values in these two markets for a few suppliers. In order to avoid the potential bias introduced by the missing data, we exclude variables (8) and (9) as control variables from regressions in the paper.

5.2. Study Procedure

Recall that half of the buyers source products for the US market and the remainder for the South African market. The buyer specifies his target market when sending out inquiries. In addition, the US (South African) IP addresses and flag figure are prominently displayed at the bottom of the messages sent by buyers selling to the US (South African) market. Buyers' racial groups (Black, Chinese, or White) are signaled by their names and profile pictures.[5]

Buyers sent messages to suppliers between July 29, 2018 and August 30, 2018. To further ensure randomization, buying representatives were instructed to not follow a pre-arrange sequence but to randomly pick one of the four treatments to send the corresponding inquiry in a random time slot. Each message asks a supplier to provide the price quote per unit for 1,000 units of pre-selected product.

The message content varies for different information conditions. In the no information condition—that is, the control group—the buyer includes the most basic information in the inquiry message. The buyer first introduces himself with "Hello, We are exploring supplier options for our business in the United States (or South Africa). We are interested in your product: [the specific product name and hyperlink]," and then requests the price quote for 1,000 units with "Could you please quote us your best price per piece (exw) for an order of 1000 units?" Here, exw, which stands for "Ex Works," is an international trade term through which a supplier makes the product available at a designated location in the supplier's country and the buyer incurs the transportation cost from therein. In other words, the quoted price does not include any transportation cost and, thus, is not confounded by transportation cost. Note that under exw, buyers pay all the tariff and related custom costs. Therefore, the tariff of a particular country does not affect the supplier's price-quoting decisions.

In order to design the market and social information content, we interviewed procurement managers and followed their common practice in price inquiry. In the market information condition, the buyer reveals his expected price. The price can signal that the buyer is aware of the prevailing market price. In the message, after introducing himself, the buyer provides the market information "We have searched for the market price, and for this model the lowest price is USD [a specific dollar value]" prior to requesting the price quote. We define the lowest price as follows. A given product model—for example, a 32-GB plastic flash drive—could have different prices due to quality differences. In our sample, the price gap could be as large as 2 USD. In order to provide suppliers with a reasonable reference price, for each product subcategory, we group suppliers into eight groups

[5] In order to avoid the possible confounders, we edit buyer photos using Photoshop and evaluate their attractiveness on AnaFace.com. Based on criteria like facial symmetry, facial structure, and the golden ratio (Hoegele et al. 2016), all profile photos receive a score of 7.9 out of 10, which validates that the photos have similar attractiveness.

based on the listed prices of the selected products. We define the bottom tenth percentile of the listed price in each group as the market price. In particular, if a product's listed price is lower than the bottom tenth percentile, we define the lowest price within the group as the market price. This ensures that the buyer's revealed market price is not higher than the listed price. In the social information condition, the buyer provides social information: "Your company was recommended to us by a peer." In the both information condition, the buyer provides both market and social information in his inquiries.

Within a week after the inquiry, we record the intial price quote[6] and code the responses into four categories: "unread" if the supplier did not read the inquiry, "read but no response" if the supplier read the inquiry without responding, "decline" if the supplier declined the inquiry, and "reply" if the supplier replied, which includes "reply without price" and "reply with price." From among of 3,840 suppliers' products, 3,716 were available. We obtained 3,185 responses from the 3,716 suppliers, 2,676 of which included a price quote.

5.3. Social Information Design Validation

Note that in our social information design, a buyer does not provide the name of the recommended peer. We provide validations that the design of such a social information message conforms to the industry norm.

First, we followed the collaborating company's requirement to not include the referee's name in social information inquiries, mainly due to the confidentiality concern. In addition, we conducted private interviews with practitioners who confirmed that it is a common practice to not disclose referees' name at least in the first inquiry.

Second, we run a survey among buyers to ascertain if this norm is recognized by others. We conduct a survey (presented in Figure 5 in the appendix) with 51 respondents who are procurement managers with an average 9.2 years of experience in global trading. In this survey, we ask procurement mangers to measure how much they agree on the following aspects: (1) in global trading, purchasing managers often recommend suppliers to each other, (2) if a supplier is recommended by a peer, buyers would often convey this to suppliers in price inquiries, (3) buyers usually choose not to disclose the referee's name in a price inquiry, and (4) why not disclose it. The level of agreement is measured by a seven-point semantic differential scale from 1 (strongly disagree) to 7 (strongly

[6] Our study focuses on the initial price quote for the following reasons. First, the initial price quote reflects the supplier's perception of the buyer's willingness-to-pay. Second, on an online B2B platform, buyers can send price inquiries to numerous suppliers without much effort. This implies that suppliers could easily lose customers to competitors if they do not offer an attractive initial price. Therefore, the initial price is a good indicator for the final transaction price. Third, the initial price quote, unlike a second price quote or price concession, is not confounded by any bargaining or negotiation techniques. Last, the initial price quote is used as a proxy for the final price in previous studies (Ayres and Siegelman 1995, Bruno et al. 2012, Castillo et al. 2013, Busse et al. 2017).

agree). We also include a neutral option (point 4). Table 7 in the appendix reports the results. We find that buyers often recommend suppliers to each other (agreement level $= 4.96$ significantly higher than the neutral point, p-value < 0.01), when recommended by a peer, buyers are likely to share this information with suppliers in the price inquiries (agreement level $= 5.12$ significantly higher than the neutral point, p-value < 0.01), and they prefer to not disclose the referee's name in price inquiry due to confidentiality reasons (agreement level $= 4.78$ significantly higher than the neutral point, p-value < 0.01).

One might question whether suppliers would find this message uncommon and therefore place less trust in the buyer. In order to address this question, we conduct a separate survey (presented in Figure 6 in the appendix) with 38 suppliers who have an average 9.5 years of experience in global trading. In the survey, we ask suppliers to measure how much they trust the social information—"your company was recommended to us by a peer" in general using the same seven-point semantic differential scale. We find that suppliers in general trust the social information (trust score $= 4.71$ significantly higher than the neutral point, p-value $= 0.004$).

6. Estimation Results

In this section, we study the reply rate, price discrimination, and the impact of information on the price quote and price discrimination. We first analyze whether buyers from different treatment conditions would have a different reply rate and reply speed from that of suppliers. Second, we test whether buyers from different countries or races would receive different price quotes. Third, we study how market and social information affect the price discount offered by suppliers. Finally, we study whether the information conditions can effectively reduce price discrimination.

6.1. Reply Rate and Speed

We record whether each supplier replied to the inquiry, and we use it to compute the reply rate based on countries, races, and information conditions. Table 9 in the appendix summarizes the number of inquiries sent and replied, the reply rate, and the reply speed. Panel A shows that US and South African buyers have a similar reply rate (p-value $= 0.17$) and reply speed (p-value $= 0.97$). Panels B and C show that buyers of different races receive a similar reply rate and reply speed (p-values ≥ 0.24). Panel C shows that there is no significant difference in reply rate and reply speed across the four information conditions (p-values ≥ 0.15). The results suggest that on the global sourcing platform, suppliers do not differentiate whether they reply or how fast they reply based on buyers' country, race, or types of information presented in the inquiry.

Next, we formally verify that suppliers' reply rate and speed do not rely on buyers' characteristics:

$$Reply_i \text{ (or } Reply\ Speed_i) = f(\alpha + \beta Treatment_i + \gamma Controls_i + \epsilon_i), \tag{1}$$

where $Reply_i$ is a binary variable that indicates whether the supplier replies on product i. $Reply\ Speed_i$ is the reply speed on product i. Function $f(\cdot)$ takes a logistic regression form when the dependent variable is $Reply_i$ and takes a linear form when the dependent variable is $Reply\ Speed_i$. $Treatment_i$ is the treatment condition for product i which takes values in $Country_i$, $Race_i$, and $Condition_i$. $Country$ is a binary variable indicating the buyer's country, which equals 0 if the buyer is from South Africa and 1 if the buyer is from the US. $Race_i$ is a categorical variable that represents whether a buyer belongs to the Asian, Black, or White racial group. $Condition_i$ is a categorical variable that represents no information, market information, social information, and both information conditions. $Controls$ is a vector of control variables including all observed supplier characteristics: response rate, gold supplier status, transaction level, listed price, and number of reviews. Although the control variables are not required in the regression of a randomization design, we include them in order to improve the estimation efficiency and show the robustness of our results. Table 10 in the appendix presents the estimation results, which confirm that suppliers do not differentiate their reply decision and reply speed based on buyers' selling country and race.

Furthermore, previous research has identified discriminatory behavior reflected in reply rates on platforms such as Airbnb (Cui et al. 2019) and Uber (Mejia and Parker 2018), where hosts and drivers determine whether to serve a customer by replying or responding. In such cases, choosing to serve a specific customer may be of significance to suppliers' safety and well-being and, thus, they use the replying decision to maximize their utility. On a trading platform, however, suppliers reply to buyers in the hope of negotiating a price and selling commodities to buyers. Therefore, it is optimal for suppliers to first reply to buyers, regardless of their origin and race, and then set a price based on buyers' willingness-to-pay.

6.2. Price Discrimination

In our study, there are variations in the listed prices of products. Higher-priced products can have a higher absolute discount value than lower-priced products. In order to have a fair comparison in the amount of price discount offered by suppliers, we follow the literature (Goldberg 1996) and compare the discount percentage offered relative to the listed price. For each product i, we define its price discount as the difference between the price listed on the webpage[7] and the supplier's quoted price relative to the listed price:

$$Discount_i = 100\% \times \left(\frac{\text{Listed Price}_i - \text{Supplier's Quoted Price}_i}{\text{Listed Price}_i} \right). \tag{2}$$

[7] The listed price is the price shown on the product page in Figure 4, e.g., \$7.3 per unit for an order size larger than 120 units. Some products have a price range instead of a price point displayed on the product page. In such cases, we record the minimum and maximum prices and compute the average price as the listed market price.

6.2.1. Country We first investigate whether suppliers price discriminate against US buyers versus South African buyers. Table 11 in the appendix summarizes the price discount by buyers' countries. In the no information condition, we find that buyers from the US receive an average discount of 7.87%, and buyers from South Africa receive an average discount of 7.84%. There is no statistically significant difference between countries (p-value = 0.99). Across all information conditions, the price discounts in the US and South Africa are 12.17% and 12.98%, respectively. The result also holds in each information condition—for example, there is no price discrimination toward buyers from the US versus buyers from South Africa irrespective of the information disclosed in the inquiry, which does not support Hypothesis 1.

We formally test price discrimination between two countries in the following manner:

$$Discount_i = \alpha + \beta Country_i + \gamma Controls_i + \epsilon_i. \tag{3}$$

The estimation results are presented in Table 4. The findings are robust: buyers from the US receive an almost identical price discount as buyers from South Africa in all information conditions, which indicates that there is no wholesale price discrimination between the United States and South Africa on Alibaba. This finding might be driven by the fact that the retail prices of the studied products are rather similar in both countries. We search for the prices of computer accessory products used in our experiment on leading retailers in each country. Table 12 in the appendix presents the prices (in USD) of the same products across the United States and South Africa, which are very close to each other. This indicates that the market price and, thus, the corresponding willingness-to-pay are almost identical across these two countries.

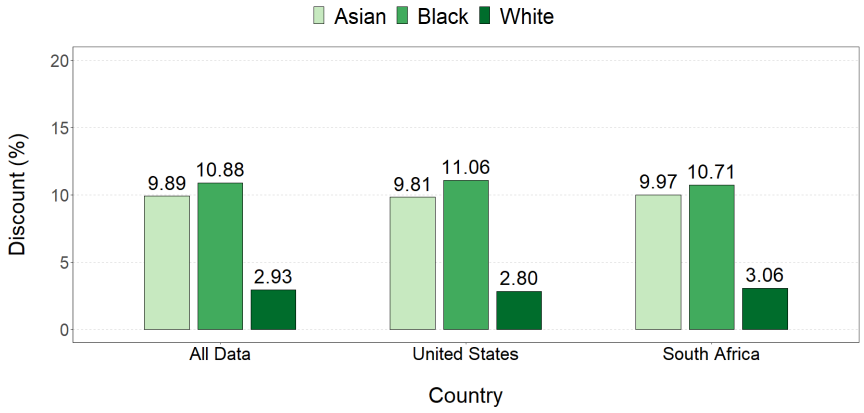
Table 4 Price Discrimination over Country

	Dependent Variable: Discount				
	No Information	Market Information	Social Information	Both Information	All Data
	I	II	III	IV	V
The US	−0.0007	−0.015	0.001	−0.019	−0.008
	(0.019)	(0.015)	(0.018)	(0.016)	(0.009)
Controls	Yes	Yes	Yes	Yes	Yes
Observations	688	655	656	677	2676
R^2	0.006	0.006	0.004	0.009	0.001

6.2.2. Race We next investigate whether suppliers price discriminate based on a buyer's race. In this section, we focus on the no information condition—that is, suppliers' price-quoting strategy in the absence of market or social information. Panel A of Table 13 in the appendix summarizes the price discounts for each race without market or social information. We also present the discount offered to each race in Figure 1. We can observe that under the no information condition, based on the pooled data across two countries, Asian and Black buyers receive a lower price quote (9.89%

and 10.88% respectively) than White buyers (2.93%). The difference between White and Black buyers and the difference between White and Asian buyers are statistically significant (p-value = 0.001 and p-value = 0.003), while the difference between Black and Asian buyers is not significant (p-value = 0.66). The same results hold true for both the US and South Africa.

Figure 1 Price Discrimination over Race



We formally test price discrimination across race using the following equation:

$$Discount_i = \alpha + \beta Race_i + \gamma Controls_i + \epsilon_i. \tag{4}$$

Column I of Table 6 presents the estimation results. In the regression, the omitted race is the White group. The coefficients of the Asian and Black groups represent the additional price discount offered to Asian and Black buyers relative to White buyers. The coefficients are positive and statistically significant. This shows the existence of wholesale price discrimination against White buyers, which supports Hypothesis 2. This discrimination might be because the suppliers believe that buyers in the White group have a higher willingness-to-pay. When buyers do not signal that they understand the market price sufficiently well, suppliers would charge buyers in the White group a higher price.

We display the estimation results of all variables, including controls of Equation (4), in Table 14. The results show that a higher listed price leads to a larger price discount. This is because high-price suppliers tend to have a larger margin to leverage over, thereby enabling them to use a deeper discount (lower price quote) to attract buyers. We also find that other controls including a supplier's past transaction volume, experience, responsiveness, and number of reviews do not affect his price-quoting strategy.

In addition, we test whether any supplier or product characteristics have an impact on price discrimination by including the interaction between a supplier or product characteristic of interest, a $Moderator$, and the buyer's race:

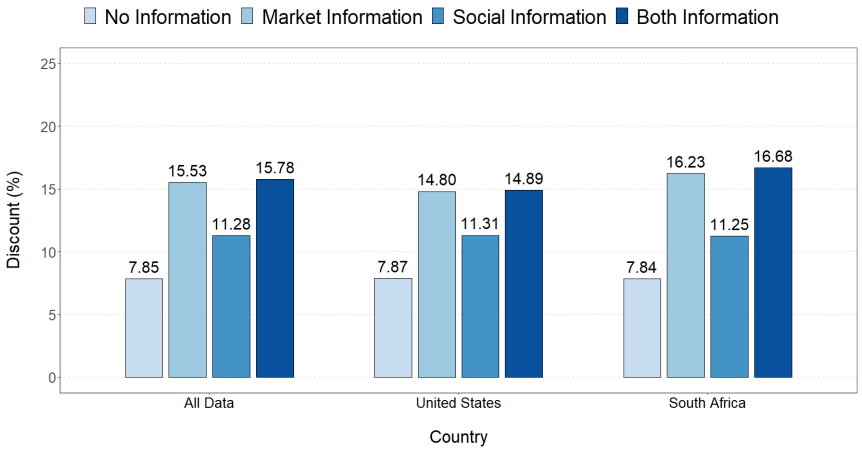
$$Discount_i = \alpha + \beta_1 Moderator_i + \beta_2 Race_i + \beta_3 Moderator_i \times Race_i + \gamma Controls_i + \epsilon_i, \tag{5}$$

where β_3 represents how supplier or product characteristics moderate price discrimination. $Moderator$ represents the supplier's response rate, gold supplier status, transaction level, number of reviews, and the product's listed price. $Controls_i$ includes all control variables except for the tested moderator. Table 15 presents the estimation results of Equation (5). None of the studied supplier characteristics (except for the listed price) has an impact on price discrimination. The listed price could reduce the price gap between Asian buyers and White buyers, but the price discrimination still remains. This implies that all suppliers use price discrimination equally, despite their experience, transaction volume, reputation, or responsiveness.

6.3. Information and Price Quote

We test how suppliers respond to market and social information. Table 16 summarizes suppliers' price discounts for different information conditions. We also plot the discount offered for each information condition in Figure 2. We observe that, across the United States and South Africa, the average price discount is 7.85% when there is no special information presented in the inquiry, 15.53% with market information, 11.28% with social information, and 15.78% with both information. Compared to the price quote under the no information condition, market and social information can effectively reduce suppliers' price quotes (p-values ≤ 0.01). The same results hold in both the US and South Africa.

Figure 2 Price Quote by Information Condition



We formally test the impact of market and social information on price quotes,

$$Discount_i = \alpha + \beta Condition_i + \gamma Controls_i + \epsilon_i. \tag{6}$$

Table 5 presents the estimation results of Equation (6). In the regression, the omitted information condition is the no information condition, and the coefficient of a specific information condition

is the additional price discount obtained relative to the no information condition. Columns I–III use pooled data, data in the US, and data in South Africa, respectively. The results are consistent: market and social information can reduce the price quote, which supports Hypothesis 3. This is because revealing buyers' prior knowledge regarding the market price signals buyers' lower willingness-to-pay, lowering the price offered by suppliers; showing social connections helps build trust between suppliers and buyers and signals the reference price within that social group. Our results also indicate that information can reduce double marginalization on B2B platforms. By receiving a lower price in a B2B marketplace, buyers, who are often retailers, can receive a lower cost and, thus, can afford to offer a lower retail price.

Table 5 Impact of Information on Price Quotes

	Dependent Variable: Discount		
	All Data	United States	South Africa
	I	II	III
Market Info	0.077***	0.070***	0.084***
	(0.012)	(0.018)	(0.017)
Social Info	0.033***	0.035*	0.033*
	(0.012)	(0.018)	(0.017)
Both Info	0.080***	0.071***	0.090***
	(0.012)	(0.018)	(0.017)
Controls	Yes	Yes	Yes
Observations	2676	1332	1344
R^2	0.022	0.018	0.033

Note: $^{*}p < 0.1$; $^{***}p < 0.01$.

Table 17 presents the price discounts by information conditions across different races. We observe that the market information reduces the wholesale price quotes for all buyers. Social information, however, only reduces the wholesale prices for Black and White buyers but not for Chinese buyers, which supports Hypothesis 4.

Mechanisms on suppliers' trust toward social information. One explanation could be that suppliers on Alibaba, over 97% of whom are Chinese, might not trust the social information claimed by Chinese buyers. Suppliers trust this information when it is provided by Black or White buyers and react to it by lowering the price. When it comes to Chinese buyers, suppliers choose to not respond to this information. Previous research has shown evidence of distrust, particularly among people who are from the same country (Bond 1986), for example, between Chinese suppliers and retailers in supply chains (Özer et al. 2014).

To confirm this intuition, we conduct a survey with 38 Chinese suppliers with an average 11.5 years of experience in global trading. In this survey, we ask the suppliers to read a price quoting message where social information—"your company was recommended to us by a peer"— and the buyer's name and photo are presented. We designed two versions of the questionnaire distinguished by only the buyer's name and photo: in version A, the message is sent by a Chinese buyer, and

in version B, the message is sent by a non-Chinese buyer. The survey in Figure 7 in the appendix summarizes these two questionnaires. We then ask the suppliers to measure how much they trust the social information in the message. Trust is measured by a seven-point semantic differential scale from 1 (strongly distrust) to 7 (strongly trust). We also include a neutral option (point 4). Pretesting confirmed that the questions were unambiguous. We randomly distributed one of the two versions to each supplier, with 18 suppliers responding to Version A and 20 suppliers responding to Version B.

Table 18 in the appendix reports the analysis of this survey. We find that same-race distrust exists. Chinese suppliers place less trust in the social information when it is provided by Chinese buyers. In particular, they provide a significantly lower trust score for Chinese buyers than non-Chinese buyers (3.11 v.s. 4.7, p-value $= 0.007$). Moreover, Chinese suppliers lean toward distrusting Chinese buyers (trust score significantly lower than the neutral point, p-value $= 0.061$) and trusting non-Chinese buyers (trust score significantly higher than the neutral point, p-value $= 0.039$).

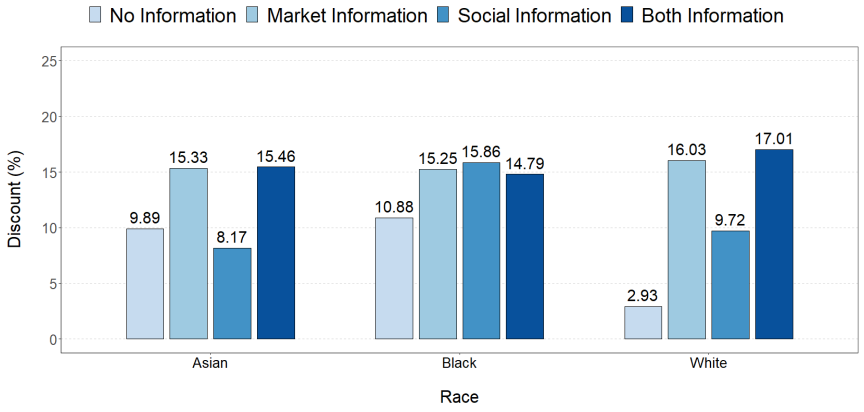
To further explore how Chinese suppliers interpret the social information presented by Chinese buyers, we conduct a separate survey (presented in Figure 6 in the appendix) with 38 Chinese suppliers with an average 9.5 years of experience in global trading. In the survey, we ask the suppliers to consider situation where they receive a price inquiry with social information sent from a Chinese buyer. We then ask them to measure how much they agree with the statement "the social information is buyer's negotiation tactic and I will not feel offended" using the same seven-point semantic differential scale. Table 8 in the appendix reports that the average score is 4.47 (significantly higher than the neutral point, p-value $= 0.058$), thereby implying that Chinese suppliers regard Chinese buyers' social information as a negotiation tactic instead of feeling emotionally offended.

6.4. Information and Price Discrimination

Here, we investigate the impacts of market information and social information on price discrimination—that is, whether information could reduce price discrimination on the B2B platform. Panels B, C, and D of Table 13 summarize the statistics of price discounts by race under market, social, and both information conditions. We visually present the discounts offered to each race under each information condition using pooled data in Figure 3. The price discrimination has almost the same pattern in both countries.

For each information condition, we first test whether suppliers' price discrimination still exists by using Equation (4). The estimation results are presented in Columns II, IV, and VI of Table 6. If an information condition can eliminate price discrimination, the coefficient of *Race* should be insignificant.

Figure 3 Price Quote by Race and Information Condition Across Two Countries



We also formally identify whether market and social information can mitigate wholesale price discrimination by estimating how an information condition moderates the price quoting gap,

$$Discount_i = \alpha + \beta_0 Condition_i + \beta_1 Race_i + \beta_3 Condition_i \times Race_i + \gamma Controls_i + \epsilon_i, \qquad (7)$$

where the coefficient β_3 of the interaction term is the moderating effect of information to price discrimination. The regression controls for all observed supplier characteristics. If an information condition can mitigate price discrimination, the coefficient β_3 must be significant. The estimation results are presented in Columns III, V, and VII of Table 6.

Market Information. From Figure 3 and Panel B of Table 13, it is evident that in the presence of market information, Asian, Black and White buyers receive a price discount of 15.33%, 15.25%, and 16.03%, respectively. The differences across these three groups of buyers are statistically insignificant. Buyers also receive almost identical price discounts in each country. Column II of Table 6 shows that the coefficients of Asian and Black buyers are insignificant, which implies that there is no price discrimination between Asian and White buyers and between Black and White buyers. Column III of Table 6 shows that the coefficient of Asian×Condition is significantly negative and the coefficient of Black×Condition is significantly negative, which further confirms the finding that the market information treatment can reduce price discrimination. The estimation results are consistent across the United States and South Africa, which supports Hypothesis 5a.

When presenting the lowest market price to suppliers, buyers signal that they have searched, investigated, and understood the market. More importantly, buyers signal the price point around which they are willing to pay for the product, which serves as a buyer-independent reference price. In response, the suppliers anchor to this reference price for buyers regardless of their race and, thus, wholesale price discrimination vanishes. Our finding shows that B2B platforms must consider providing market information to reduce price discrimination. For example, platforms could collect the prices of similar products and reveal information to buyers as a reference. Improving

Table 6 Price Discrimination over Race

	Dependent Variable: Discount						
	Panel A: All Data						
	No Info	Market Info		Social Info		Both Info	
	I	II	III	IV	V	VI	VII
Asian	0.069***	−0.008	0.069***	−0.016	0.069***	−0.016	0.069***
	(0.024)	(0.019)	(0.021)	(0.022)	(0.023)	(0.020)	(0.022)
Black	0.080***	−0.008	0.080***	0.061***	0.080***	−0.021	0.080***
	(0.023)	(0.018)	(0.021)	(0.022)	(0.022)	(0.020)	(0.022)
Condition			0.131***		0.067***		0.141***
			(0.021)		(0.023)		(0.022)
Asian×Condition			−0.077**		−0.085***		−0.084***
			(0.031)		(0.033)		(0.031)
Black×Condition			−0.088***		−0.018		−0.102***
			(0.030)		(0.032)		(0.031)
Controls	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Observations	688	655	1343	656	1344	677	1365
R^2	0.026	0.005	0.042	0.025	0.029	0.009	0.041
	Panel B: United States						
	No Info	Market Info		Social Info		Both Info	
	I	II	III	IV	V	VI	VII
Asian	0.069**	−0.008	0.072**	−0.016	0.069**	−0.015	0.071**
	(0.035)	(0.028)	(0.031)	(0.032)	(0.033)	(0.029)	(0.032)
Black	0.079**	−0.025	0.085***	0.056*	0.081**	−0.034	0.084***
	(0.035)	(0.027)	(0.031)	(0.031)	(0.033)	(0.028)	(0.032)
Condition			0.135***		0.068**		0.139***
			(0.031)		(0.034)		(0.032)
Asian×Condition			−0.080*		−0.083*		−0.085*
			(0.046)		(0.047)		(0.046)
Black×Condition			−0.110**		−0.022		−0.119***
			(0.044)		(0.047)		(0.045)
Controls	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Observations	345	318	663	327	672	342	687
R^2	0.032	0.033	0.039	0.035	0.035	0.016	0.036
	Panel C: South Africa						
	No Info	Market Info		Social Info		Both Info	
	I	II	III	IV	V	VI	VII
Asian	0.069**	−0.012	0.072**	−0.013	0.068**	−0.019	0.067**
	(0.033)	(0.026)	(0.029)	(0.032)	(0.032)	(0.028)	(0.030)
Black	0.080**	0.007	0.080***	0.070**	0.077**	−0.003	0.076***
	(0.031)	(0.025)	(0.028)	(0.033)	(0.031)	(0.028)	(0.029)
Condition			0.136***		0.064**		0.145***
			(0.029)		(0.031)		(0.029)
Asian×Condition			−0.083**		−0.082*		−0.085**
			(0.042)		(0.045)		(0.043)
Black×Condition			−0.072*		−0.009		−0.082*
			(0.040)		(0.045)		(0.042)
Controls	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Observations	343	337	680	329	672	335	678
R^2	0.033	0.028	0.062	0.029	0.032	0.024	0.057

Note: Column III uses the pooled data from Columns I and II (i.e., pooling data under the no information condition and the market information condition). Column V uses the pooled data from Columns I and IV (i.e., pooling data under the no information condition and the social information condition). Column VII uses the pooled data from Columns I and VI (i.e., pooling data under the no information condition and the both information condition). $^{*}p < 0.1$; $^{**}p < 0.05$; $^{***}p < 0.01$.

information transparency could bolster the information symmetry between suppliers and buyers, thereby preventing suppliers from discriminating against buyers of a certain race.

Social Information. From Figure 3 and Panel C of Table 13 , it is evident that in the presence of social information, Asian, Black and White buyers receive a price discount of 8.17%, 15.86%,

and 9.72%, respectively. The differences between Black and White buyers and between Asian and Black buyers are statistically significant. This pattern is consistent across countries.

We first discuss the price quotes between Black and White buyers. Compared to the no information condition, social information reduces the quoted prices for both types of buyers. Column IV of Table 6 shows that the coefficients of Black are significant, and Column V of Table 6 shows that the coefficients of Black×Condition are insignificant. The estimations are consistent across the United States and South Africa. The results imply that although social information can reduce price quotes for both Black and White buyers, the price gap between them still remains—wholesale price discrimination between Black and White buyers exists, which supports Hypothesis 5b.

When a buyer says that the supplier was recommended, the buyer signals a social connection with the supplier's previous customers. This social information also signals the recommender's likely racial group and the historical price charged to this group, which serves as a buyer-dependent reference price. In response, the supplier anchors to this reference price, which is higher for White buyers than Black buyers. As a result, although the supplier lowers the price, the gap between Black and White buyers still remains.

Both Information. From Figure 3 and Panel D of Table 13, it is evident that when both market and social information are presented to suppliers, Asian, Black and White buyers receive a price discount of 15.46%, 14.79%, and 17.01%, respectively, the magnitude of which is consistent with that under the market information condition. Intuitively, market price is a piece of public information that can be more easily verified than the social information and, thus, it sends a stronger signal and dominates the social information. Columns VI and VII of Table 6 also show that there is no wholesale price discrimination under this information condition.

7. Concluding Remarks

Price discrimination is pervasive in various B2C markets, whereas it is unclear whether wholesale price discrimination exists in online B2B markets, where buyers are often not end customers but procurement agents who represent a firm.

In this paper, we find evidence of wholesale price discrimination based on race in global sourcing—suppliers price discriminate against White buyers. We also show that there is no price discrimination based on country—suppliers quote the same price to buyers selling to the US and South African markets. We further show that telling suppliers the market price—that is, market information—can reduce wholesale price quotes for all buyers and, thus, reduce wholesale price discrimination. Indicating that the buyer is referred by a previous customer—that is, social information—can reduce the wholesale price quote only for Black and White buyers but not for Chinese buyers, thereby failing to reduce wholesale price discrimination.

7.1. Law Implications

Across the world, price discrimination—the practice of selling the same product to different customers at different prices even though the cost is the same (Posner 2009)—is often prohibited by competition law, a law aiming to promote market competitions and protect consumer welfare by regulating anti-competitive practices. In B2B trading, suppliers engaging in price discrimination place some buyers in a competitive disadvantage, thereby distorting downstream competition. In the extreme, discriminated buyers might be forced out of the market. The surviving ones would have the power to increase the retail price at the expense of end consumers, thereby leading to a lower consumer welfare. The competition laws are enacted against such restriction of competition.

By 2017, over 120 countries have adopted their own national competition law. For example, the US adopted the Robinson-Patman Act as a federal law that prohibits price discrimination, as expressed in section 2(a):

> It shall be unlawful for any person engaged in commerce, in the course of such commerce, either directly or indirectly, to discriminate in price between different purchasers of commodities.[...] where the effect of such discrimination may be substantially to lessen competition or tend to create a monopoly in any line of commerce.

Furthermore, European Union complies with Article 82 of the European Communities Treaty (now Article 102 of the Treaty on the Functioning of the European Union) that prohibits an abuse of price discrimination in trading: For example, Article 82(c) states that the conduct of a company is considered as infringing if it has been "applying dissimilar conditions [e.g., dissimilar prices] to equivalent transactions with other trading parties, thereby placing them at a competitive disadvantage." Section 9 of Competition Act in South Africa regulates that "an action by a dominant firm, as the seller of goods or services, is prohibited price discrimination." Similarly, China implemented the Anti-Monopoly Law of the People's Republic of China, Article 33 of which prohibits suppliers from "imposing discriminative charge items, discriminative charge standards or discriminative prices upon commodities from outside the locality."

Given the increasing trend in globalization, certain countries have exercised extraterritorial jurisdiction in competition cases, because anti-competitive conduct may produce adverse economic effects in multiple jurisdictions, unconfined by territorial boundaries (Taylor 2006). For example, the World Trade Organization establishes the General Agreement on Trade in Services, which includes several provisions on cross-border competition issues.

7.2. Managerial Implications

Our work can provide implications on the management of global sourcing platforms, the pricing strategies of suppliers, and the inquiry strategies of buyers.

For suppliers, in contrast to B2C business, which is often a one-off transaction, B2B business is expected to be a long-term and mutually beneficial relationship. Price discriminating against buyers could benefit suppliers in the short term yet backfire in the long run. A buyer may eventually find out the price offered by suppliers to others, which will tarnish the supplier's reputation and ruin the long-term relationship. To make matters worse, such an unfair treatment could force the disadvantageous buyers out of the market, thereby lessening the downstream competition in the market, which eventually hurts suppliers.

For buyers, price inquiry must be exercised with caution. Our results suggest that buyers should do more research to understand the market price and explore potential business referrals as well as reveal such information to suppliers, as recommended by Demand Gen Report (2016).

For platforms, platform owners should consider reducing price discrimination behavior for two reasons. First, in the face of price discrimination, a buyer might end up paying a higher wholesale price for the same product or incur a higher search cost when spending time and effort in collecting information to avoid being discriminated. This could lead to buyers' frustration and dissatisfaction so that they might eventually leave the trading platform. This negative word of mouth in sellers' reputation also increases the probability that they leave the market (Moreno and Terwiesch 2014). Second, B2B trading platforms, like Alibaba.com, are a classic two-sided marketplace where two distinct user groups exchange value with one another. Value is created when the supply side and the demand side are matched effectively and efficiently (Chu and Manchanda 2016). The key here is to scale up the network size. Therefore, establishing a fair trading environment can attract buyers who will in turn bring more suppliers to the platform, a prerequisite to continuously grow and match the market. Based on our numerical calculation, the economic impact of price discrimination is a 1.368%–1.435% reduction to Alibaba's B2B platform revenue.[8]

[8] Alibaba generates the revenue from the fees it charges to suppliers, such as the annual membership fee ($4260 per supplier) and the advertising fee (to increase their product ranking in searching). Price discrimination hurts the revenue of the platform by losing suppliers due to the reputation and the network effects. We use the estimated parameters together with some assumptions to compute the economic size of price discrimination on a platform. First, price discrimination can cause frustration and dissatisfaction for buyers, which may cause them to leave negative reviews for suppliers, which increases the probability that the suppliers leave the marketplace. The percentage of suppliers that leave the platform due to the reputation effect is the interaction of the following terms: (1) the percentage of White buyers on Alibaba (43%), (2) the probability that a White buyer finds out that he or she is being price discriminated against ($7.46\% = (10.88\% + 9.89\%)/2 - 2.93\%$, which is calculated based on the assumption that this probability equals the extra price percentage charged to White buyers compared with non-White buyers), (3) the probability that a buyer leaves a review to the supplier after completing the transaction (6.25%, which is estimated from our sample), and (4) the probability that a supplier leaves the platform after receiving a bad review (ranging from 6.4% to 40%, which is estimated by Moreno and Terwiesch 2014). Therefore, the percentage of suppliers lost due to the reputation effect ranges from $43\% \times 7.46\% \times 6.25\% \times 6.4\% = 0.013\%$ to $43\% \times 7.46\% \times 6.25\% \times 40\% = 0.080\%$.

Second, when buyers leave the platform, the decreased size of the platform reduces the matching efficiency and hurts the user experience, which will further drive suppliers away, the so-called network effect. The percentage of suppliers that leave the platform due to the network effect is the interaction of the following terms: (1) the percentage of White buyers on Alibaba (43%), (2) the probability that a White buyer finds out that he or she is being price

Our findings provide guidance on how to reduce price discrimination for platforms. In particular, platforms can introduce more transparent information in order to reduce price discrimination. Organizing and presenting information in a manner that customers can easily compare market prices enables buyers to search more effectively, thereby leading to more attractive wholesale prices. This could provide platforms with a competitive edge over other transaction channels. Allowing suppliers and buyers to easily find and present social connections could also lead to lower prices. These strategies can enable a platform attract new buyers and retain current customers.

Although retail pricing in B2C markets has been well studied in the literature, pricing in B2B markets lacks the same empirical understanding. Our work is one of the first steps in advancing our empirical understanding of wholesale pricing. We hope that our paper will serve as a stepping stone for future research on B2B markets and wholesale pricing.

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discriminated against (7.46%), (3) the probability that a buyer who is aware of being discriminated leaves the platform (96%, which is estimated by Evans and Lindsay 2013), and (4) the number of suppliers' leaving the platform due to the loss of buyers (44%, which is estimated by Chu and Manchanda (2016) that when buyers decrease by 1%, the number of sellers on average decreases by 0.44%). That is, the percentage of suppliers lost due to the network effect is $43\% \times 7.46\% \times 96\% \times 44\% = 1.355\%$.

To summarize, the total impact of price discrimination to Alibaba's B2B platform ranges from a $0.013\% + 1.355\% = 1.368\%$ to $0.08\% + 1.355\% = 1.435\%$ revenue reduction. Given that Alibaba's total revenue in 2019 is estimated to be \$1217 million (Alibaba 2019), the economic impact scaled at the platform level ranges from \$1217 million × 1.368% = \$16.65 million to \$1217 million × 1.435% = \$17.46 million.

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Appendices

Figure 4 Alibaba Supplier Product Page Example

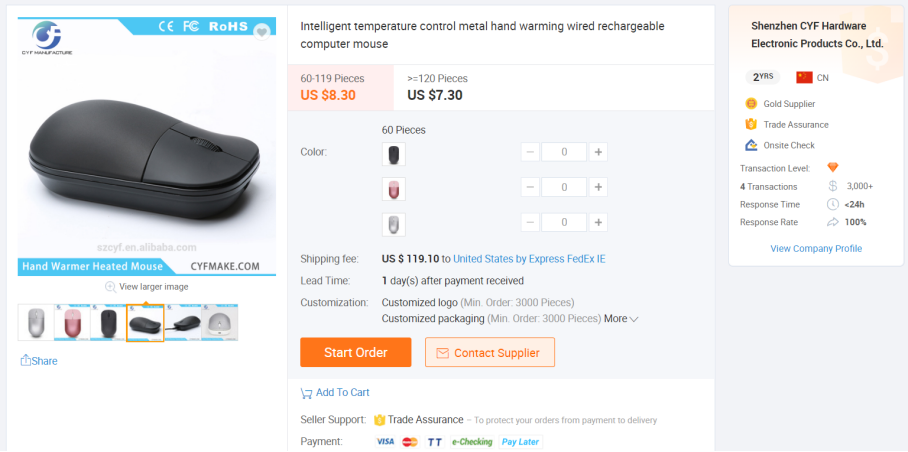


Figure 5 Buyer Survey

The results of this study will be used for scholarly purposes only and your information will be kept strictly confidential. We greatly appreciate your effort in answering the following questions carefully. Thank you very much.

Section I: Personal Information

1. Please specify your gender: ☐ Male ☐ Female

2. Please specify your job title: _____

3. How many years of work experience do you have in global trading?_____

4. Do you have any experience in sending price inquiries?_____

Section II: Social Information

Please indicate your level of agreement on each of the following statements.

1. In global trading, purchasing managers often recommend suppliers to each other.

Mark one: ☐Strongly disagree ☐Moderately disagree ☐Slightly disagree
☐Neither disagree nor agree ☐Slightly agree ☐Moderately agree ☐Strongly agree

2. If I am sending a price inquiry to a supplier that is recommended by a peer, I would often tell this to the supplier.

Mark one: ☐Strongly disagree ☐Moderately disagree ☐Slightly disagree
☐Neither disagree nor agree ☐Slightly agree ☐Moderately agree ☐Strongly agree

3. I usually choose not to disclose the referee's name in price inquiry.

Mark one: ☐Strongly disagree ☐Moderately disagree ☐Slightly disagree
☐Neither disagree nor agree ☐Slightly agree ☐Moderately agree ☐Strongly agree

4. Why do you choose not to disclose the referee's name? (Please skip this question if it is not applicable)

Mark one: ☐ I forgot the referee's name.
☐ Due to confidentiality concerns, I am unwilling to disclose information about the referee.
☐ Others, please specify:_____

Table 7 Buyer Survey: Agreement Level on Social Information

	Sample Size	Mean	Std	Median	Difference from Neutral p-value
Q1. Recommend suppliers to each other	51	4.96	1.61	5.00	0.0002
Q2. Use social information	51	5.12	1.67	5.00	0.0001
Q3. Not disclose referee's name	51	4.78	1.95	5.00	0.009
Q4. Confidentiality concern option (% of respondents)	38	92.11			

Note: This table reports buyers' agreement level on that (1) they often recommend suppliers to each other, (2) they often inform suppliers that the suppliers are recommended by a peer in price inquiries, and (3) they choose not to disclose referees' name in price inquiries. We conduct the Wilcoxon signed rank test to test the difference between the agreement level and neutral point 4.

Figure 6 Supplier Survey: Interpretation of Social Information

The results of this study will be used for scholarly purposes only and your information will be kept strictly confidential. We greatly appreciate your effort in answering the following questions carefully. Thank you very much.

Section I: Personal Information

1. Please specify your gender: ☐ Male ☐ Female

2. Please specify your job title: _____

3. How many years of work experience do you have in global trading?_____

4. Do you have any experience in quoting buyers?_____

Section II: Social Information

1. Consider the scenario that you receive a price inquiry with social information from a purchasing manager representing a global trading company. **Social information** refers to "*your company was recommended to us by a peer.*" Do you trust such social information? That is, do you believe that you are indeed recommended to this purchasing manager by someone?

Mark one: ☐Strongly disagree ☐Moderately disagree ☐Slightly disagree
☐Neither disagree nor agree ☐Slightly agree ☐Moderately agree ☐Strongly agree

2. Consider the scenario that you receive a price inquiry with social information from a Chinese purchasing manager representing a global trading company. **Social information** refers to "your company was recommended to us by a peer." Please indicate your level of agreement on the statement---"the social information is buyer's negotiation tactic, and I will not feel offended."

Mark one: ☐Strongly disagree ☐Moderately disagree ☐Slightly disagree
☐Neither disagree nor agree ☐Slightly agree ☐Moderately agree ☐Strongly agree

Table 8 Supplier Survey: Interpretation of Social Information

	Sample Size	Mean	Std	Median	Difference from Neutral p-value
Q1. Trust social information sent by a general buyer	38	4.71	1.52	4.50	0.004
Q2. Regard social information as a negotiation tactic	38	4.47	1.41	4.00	0.058

Note: This table reports (1) suppliers' trust score on social information provided by general buyers, and (2) suppliers' level of agreement on that they regard the social information provided by Chinese buyers as a negotiation tactic. We conduct the Wilcoxon signed rank test to test the difference between the level of agreement and neutral point 4.

Table 9 Summary Statistics of Reply Rate and Reply Speed

	No. of Suppliers	No. of Inquiries Sent	No. of Inquiries Replied	Reply Rate	Reply Speed (hour)
			Panel A: By Country		
United States	1920	1862	1611	86.52%	10.10
South Africa	1920	1854	1574	84.90%	10.08
USA vs RSA (p-value)				1.62% (0.17)	0.02 (0.97)
			Panel B: By Race		
Asian	1280	1233	1043	84.59%	10.07
Black	1280	1253	1080	86.19%	10.08
White	1280	1230	1062	86.34%	10.11
White vs Black (p-value)				0.15% (0.96)	0.03 (0.96)
Black vs Asian (p-value)				1.60% (0.28)	0.01 (0.99)
White vs Asian (p-value)				1.75% (0.24)	0.04 (0.95)
			Panel C: By Information Condition		
No Info	960	938	815	86.89%	9.72
Market Info	960	924	780	84.42%	10.54
Social Info	960	926	786	84.88%	10.08
Both Info	960	928	804	86.64%	9.75
Market vs No Info (p-value)				−2.47% (0.15)	0.82 (0.42)
Social vs No Info (p-value)				−2.01% (0.24)	0.36 (0.50)
Both vs No Info (p-value)				−0.25% (0.93)	0.03 (0.25)

Note: This table reports the reply rate and reply speed by country, race, and information condition, respectively. The difference between the number of suppliers and the number of inquiries sent is due to suppliers' unavailability. The number of inquiries replied includes the number of replies without a price quote and the number of replies with a price quote. Where Reply Rate = No. of Inquiries Replied / No. of Inquiries sent. USA vs RSA, White vs Black, Black vs Asian, White vs Asian, Market vs No Info, Social vs No Info, and Both vs No Info refer to the difference in buyers' reply rate or reply speed across countries, races, and information conditions. We conduct proportion test and t-test for reply rate and reply speed, respectively.

Table 10 Reply and Reply Speed over Different Treatments

	Panel A: By Country	
	Reply	Reply Speed
The US	0.146	0.102
	(0.096)	(0.478)
Controls	Yes	Yes
Observations	3716	3185
	Panel B: By Race	
	Reply	Reply Speed
Asian	−0.141	−0.013
	(0.117)	(0.588)
Black	−0.015	0.046
	(0.119)	(0.583)
Controls	Yes	Yes
Observations	3716	3185
	Panel C: By Information Condition	
	Reply	Reply Speed
Market Info	−0.207	−0.576
	(0.135)	(0.676)
Social Info	−0.164	−0.534
	(0.136)	(0.675)
Both Info	−0.027	−0.781
	(0.139)	(0.671)
Controls	Yes	Yes
Observations	3716	3185

Note: This table reports the estimated coefficients and standard errors (in parentheses) of variables as specified in Equation (1). We take a logistic regression for *Reply* and a linear regression for *Reply Speed*. Significance at $^{*}p < 0.1$; $^{**}p < 0.05$; $^{***}p < 0.01$.

Table 11 Summary Statistics of Price Discount by Country

	United States	South Africa	No Information		Market Information		Social Information		Both Information	
			USA	RSA	USA	RSA	USA	RSA	USA	RSA
Sample Size	1332	1344	345	343	318	337	327	329	342	335
Mean	12.17%	12.98%	7.87%	7.84%	14.80%	16.23%	11.31%	11.25%	14.89%	16.68%
Std	0.22	0.23	0.27	0.24	0.20	0.19	0.23	0.24	0.22	0.21
Mean Difference		−0.81%		0.03%		−1.43%		0.06%		−1.79%
p-value of t-test		0.36		0.99		0.35		0.98		0.27

Note: This table reports the price discount received by buyers across countries. Number refers to the number of inquiries replied with price quotes.

Table 12 Example of Product Prices in United States and South Africa

	Amazon (United States)	Takealot (South Africa)
Logitech Wirless Mouse (M185, Blue)	$14.99	$15.40
ADATA Flash Drive (AC008-32G-RWE)	$13.10	$12.59
Unitek USB Hub (4-Port, USB 3.0)	$13.99	$13.71
JBL Headphone (T450BT, Blue)	$49.95	$49.16
Remax Bluetooth Speaker (M15, 5W)	$24.00	$24.26

Note: The exchange rate at the time of our study is USD:ZAR=1:14.22.

Table 13 Summary Statistic of Price Discount by Race

	All Data			United States			South Africa		
	Asian	Black	White	Asian	Black	White	Asian	Black	White
				Panel A: No Information					
Sample Size	217	236	235	115	114	116	102	122	119
Mean	9.89%	10.88%	2.93%	9.81%	11.06%	2.80%	9.97%	10.71%	3.06%
Std	0.21	0.26	0.27	0.22	0.29	0.27	0.21	0.23	0.27
	W vs B	B vs A	W vs A	W vs B	B vs A	W vs A	W vs B	B vs A	W vs A
Mean Difference	−7.95%	0.99%	−6.96%	−8.26%	1.25%	−7.01%	−7.65%	0.74%	−6.91%
p-value of t-test	0.001	0.66	0.003	0.03	0.71	0.03	0.02	0.80	0.03
				Panel B: Market Information					
Sample Size	198	237	220	93	114	111	105	123	109
Mean	15.33%	15.25%	16.03%	15.13%	13.43%	15.94%	15.50%	16.94%	16.11%
Std	0.18	0.21	0.20	0.19	0.21	0.20	0.18	0.21	0.19
	W vs B	B vs A	W vs A	W vs B	B vs A	W vs A	W vs B	B vs A	W vs A
Mean Difference	0.78%	−0.08%	0.70%	2.51%	−1.70%	0.81%	−0.83%	1.44%	0.61%
p-value of t-test	0.68	0.97	0.71	0.36	0.54	0.77	0.75	0.57	0.81
				Panel C: Social Information					
Sample Size	218	222	216	104	119	104	114	103	112
Mean	8.17%	15.86%	9.72%	8.22%	15.51%	9.59%	8.12%	16.26%	9.84%
Std	0.23	0.24	0.22	0.25	0.23	0.20	0.22	0.25	0.24
	W vs B	B vs A	W vs A	W vs B	B vs A	W vs A	W vs B	B vs A	W vs A
Mean Difference	−6.14%	7.69%	1.55%	−5.92%	7.29%	1.37%	−6.42%	8.14%	1.72%
p-value of t-test	0.006	0.0007	0.48	0.04	0.03	0.66	0.06	0.01	0.58
				Panel D: Both Information					
Sample Size	215	226	236	105	120	117	110	106	119
Mean	15.46%	14.79%	17.01%	15.20%	13.07%	16.49%	15.70%	16.75%	17.53%
Std	0.20	0.21	0.22	0.21	0.23	0.21	0.20	0.19	0.24
	W vs B	B vs A	W vs A	W vs B	B vs A	W vs A	W vs B	B vs A	W vs A
Mean Difference	2.22%	−0.67%	1.55%	3.42%	−2.13%	1.29%	0.78%	1.05%	1.83%
p-value of t-test	0.27	0.74	0.44	0.23	0.47	0.65	0.78	0.69	0.53

Note: This table reports the price discounts received by buyers of different race in two countries, where A, B, and W represent the Asian, Black, and White buyers, respectively.

Table 14 Control Variable Coefficients

	Discount
Asian	0.069***
	(0.024)
Black	0.080***
	(0.023)
Response Rate	0.017
	(0.060)
Gold Supplier (years)	0.0009
	(0.003)
Transaction Level	−0.004
	(0.012)
Listed Price	0.004*
	(0.002)
No. of Reviews	0.0002
	(0.001)
Observations	2676
R^2	0.026

Note: This table reports the estimated coefficients and standard errors (in parentheses) for variables in Equation (4).
Significance at $^{*}p < 0.1$; $^{**}p < 0.05$; $^{***}p < 0.01$.

Table 15 Moderating Factors

	Dependent Variable: Discount					
	No Moderator	Response Rate	Gold Supplier (years)	Transaction Level	Listed Price	No. of Reviews
Asian	0.069***	0.069***	0.069***	0.069***	0.171***	0.068***
	(0.024)	(0.024)	(0.024)	(0.024)	(0.046)	(0.024)
Black	0.080***	0.080***	0.080***	0.081***	0.098***	0.078***
	(0.023)	(0.023)	(0.023)	(0.023)	(0.045)	(0.023)
Moderator		−0.039	−0.003	−0.008	0.010**	0.0008
		(0.094)	(0.005)	(0.020)	(0.004)	(0.003)
Asian×Moderator		0.109	0.007	0.025	−0.014***	−0.004
		(0.143)	(0.007)	(0.028)	(0.005)	(0.003)
Black×Moderator		0.077	0.006	−0.014	−0.003	0.002
		(0.133)	(0.007)	(0.028)	(0.006)	(0.003)
Controls	Yes	Yes	Yes	Yes	Yes	Yes
Observations	688	688	688	688	688	688
R^2	0.026	0.027	0.028	0.029	0.037	0.033

Note: This table reports the estimated coefficients and standard errors (in parentheses) for moderators as specified in Equation (5). *Controls* includes all control variables except for the tested moderator.
Significance at $^{*}p < 0.1$; $^{**}p < 0.05$; $^{***}p < 0.01$.

Table 16 Summary Statistic of Price Discount by Information Condition

	No Information	Market Information	Social Information	Both Information
		Panel A: All Data		
Sample Size	688	655	656	677
Mean	7.85%	15.53%	11.28%	15.78%
Std	0.25	0.29	0.23	0.21
		Market vs No	Social vs No	Both vs No
Mean Difference		7.68%	3.43%	7.93%
p-value of t-test		6.18×10^{-10}	0.01	4.95×10^{-10}
		Panel B: United States		
Sample Size	345	318	327	342
Mean	7.87%	14.80%	11.31%	14.89%
Std	0.27	0.20	0.23	0.22
		Market vs No	Social vs No	Both vs No
Mean Difference		6.93%	3.44%	7.02%
p-value of t-test		1.55×10^{-4}	0.07	1.52×10^{-4}
		Panel C: South Africa		
Sample Size	343	337	329	335
Mean	7.84%	16.23%	11.25%	16.68%
Std	0.24	0.19	0.24	0.21
		Market vs No	Social vs No	Both vs No
Mean Difference		8.39%	3.41%	8.84%
p-value of t-test		6.07×10^{-7}	0.06	4.24×10^{-7}

Note: This table reports the price discounts under different information conditions in two countries.

Table 17 Summary Statistic of Price Discount by Information Condition across Race

	No Information	Market Information	Social Information	Both Information
		Panel A: Asian		
Sample Size	217	198	218	215
Mean	9.89%	15.33%	8.17%	15.46%
Std	0.21	0.18	0.23	0.20
		Market vs No	Social vs No	Both vs No
Mean Difference		5.44%	−1.72%	5.57%
p-value of t-test		0.005	0.42	0.006
		Panel B: Black		
Sample Size	236	237	222	226
Mean	10.88%	15.25%	15.86%	14.79%
Std	0.26	0.21	0.24	0.21
		Market vs No	Social vs No	Both vs No
Mean Difference		4.37%	4.98%	3.91%
p-value of t-test		0.04	0.03	0.08
		Panel C: White		
Sample Size	235	220	216	236
Mean	2.93%	16.03%	9.72%	17.01%
Std	0.27	0.20	0.22	0.22
		Market vs No	Social vs No	Both vs No
Mean Difference		13.10%	6.79%	14.08%
p-value of t-test		6.71×10^{-9}	0.004	1.90×10^{-9}

Note: This table reports the price discounts received by buyers under four different information conditions.

Table 18 Supplier Survey: Trust in Social Information

	Sample Size	Mean	Std	Median	Difference from Neutral p-value	Chinese vs non-Chinese p-value
Chinese Buyer	18	3.11	1.84	2.00	0.061	0.007
non-Chinese Buyer	20	4.70	1.38	4.50	0.039	

Note: This table reports the suppliers' trust scores on social information provided by Chinese buyers and non-Chinese buyers, respectively. We conduct the Wilcoxon signed rank test to test the difference between the trust score and neutral point 4 and the difference between Chinese and non-Chinese buyers.

Figure 7 Supplier Survey: Trust in Social Information

Version A

The results of this study will be used for scholarly purposes only and your information will be kept strictly confidential. We greatly appreciate your effort in answering the following questions carefully. Thank you very much.

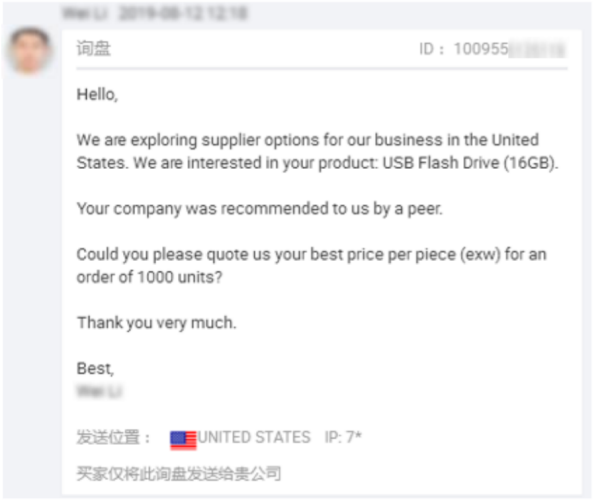
1. Please specify your gender: ☐ Male ☐ Female

2. Please specify your job title:_____

3. How many years of work experience do you have in global trading?_____

4. Do you have any experience in quoting buyers?_____

5. Suppose that you receive a price inquiry from a Chinese purchasing manager representing a global trading company, as shown in the following picture. To what extent do you believe that you are indeed recommended to this purchasing manager by someone?



Mark one: ☐Strongly distrust ☐Moderately distrust ☐Slightly distrust ☐Neither distrust nor trust ☐Slightly trust ☐Moderately trust ☐Strongly trust

Version B

The results of this study will be used for scholarly purposes only and your information will be kept strictly confidential. We greatly appreciate your effort in answering the following questions carefully. Thank you very much.

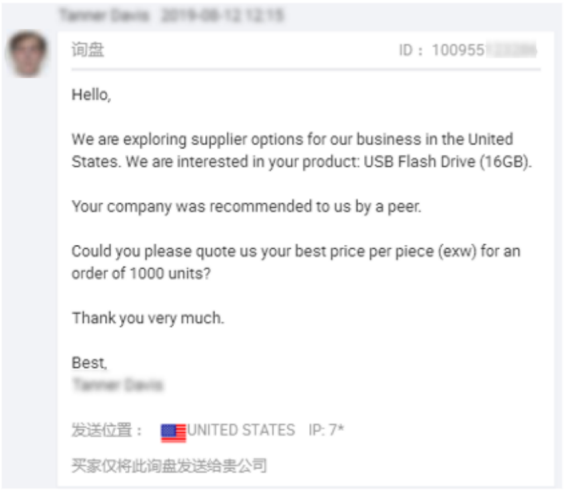
1. Please specify your gender: ☐ Male ☐ Female

2. Please specify your job title:_____

3. How many years of work experience do you have in global trading? _____

4. Do you have any experience in quoting buyers? _____

5. Suppose that you receive a price inquiry from a non-Chinese purchasing manager representing a global trading company, as shown in the following picture. To what extent do you believe that you are indeed recommended to this purchasing manager by someone?



Mark one: ☐Strongly distrust ☐Moderately distrust ☐Slightly distrust ☐Neither distrust nor trust ☐Slightly trust ☐Moderately trust ☐Strongly trust