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WOMEN AND TRADE: GENDER'S IMPACT ON TRADE FINANCE AND FINTECH

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Abstract

Woman-owned firms engage differently with finance for trade. The barriers they face in starting and running a business are well-known. Yet, this offers little insight into how they finance their business once globalized. Surveys indicate that finance is often the primary barrier to trade. We seek to deepen and modernize this finding by using a unique data set to explore the patterns of financial access exhibited by woman-owned exporting firms. We show that women face two levels of exclusion in access to finance—access to basic finance and access to trade finance. The latter is driven by characteristics common to firms owned by women. Also, in line with existing work, we show that woman-owned firms tend to turn to informal finance as an alternative more than their male counterparts. However, we also show that women are more likely to adopt fintech as a financial solution than men. This suggests that policies aimed at incentivizing banks to lend more to women may not be solving the right problem.

JEL Classification: F1, P45, J16

Contents

1. INTRODUCTION

Does the gender of an exporter affect her ability to secure finance for trade? Lately the policy spotlight has turned to the difficulties small and medium-sized enterprises (SMEs) face in entering and thriving in cross-border trade (see, for example, ITC 2016; WTO 2016). Since woman-owned firms fall disproportionately into this size category, this raises questions about the potential impact of gender.

SMEs consistently report access to finance as their main constraint to growth and trade. And supply-side evidence confirms that financial institutions are more likely to transact with large firms. This stems from the characteristics of SMEs – specifically, they apply for low volumes of finance, they are less likely to have sophisticated financial documentation, and they often lack access to collateral. Together, these make it difficult for financial institutions to profitably assess risk and offer finance to SMEs.

The lack of access to capital occurs—as we will show—at two levels. The first is the basic banking relationship. SMEs report much lower levels of banking engagement and basic loans than larger firms. The second is access to trade finance. Even after SMEs have secured a banking relationship, data show that they are more likely to be denied trade finance than other firms. This is problematic from a policy perspective because securing a loan from a bank solves the problem of basic financial access, but if exclusion re-emerges when the firm is ready to seek export finance, then we need to consider other interventions.

Increasingly, policy makers have looked towards the rise of fintech as a potential solution to the finance gap for SMEs. Fintech providers tend to target SMEs and some specifically target exporters. Yet research-based evidence that fintech can solve the finance gap for SMEs is still only in the initial stages. There is growing analysis on the supply side of fintech, but there is less on the borrower side.

We extend the literature on SME access to finance by looking in particular at the case of woman-owned firms. Globally, only 10.1% of all formal-sector firms are led by women. We know very little about this population. Partly, this is a result of data collection and specification issues.[1] But it also reflects a lack of attention to export finance in the broader access-to-finance discussion.

The question of gender-specific engagement in trade finance is a particularly important question for Asia and the Pacific where only 3% of firms are led by women.

To the extent that gender has entered the discussion about finance and trade, the focus has been almost exclusively on informal firms (e.g., Shepherd and Stone 2017). This makes it difficult to extrapolate how gender impacts firms that operate in the formal and exporting sectors.

To explore whether woman-owned firms that export exhibit different access and usage patterns in trade finance, we focus on two questions. Each introduces additional nuance to the existing story about the challenges facing, and behaviors exhibited by, woman-led firms that trade.

First: Is there a gender differential in patterns of access to finance? We look at both access to basic finance and access to trade finance, and confirm that women face different barriers that result in lower access.

[1] See Presbitero et al. (2014) for a discussion about the tricky issue of how to define a “woman-led firm,” for example.

The second question is: When woman-owned firms are rejected for trade finance, do they secure alternative capital through the emerging fintech channel? This question allows us to explore the issue of how technology impacts trade finance access by underserved firms.

Our data show that woman-owned firms are securing fintech as an alternative source of capital, though the actual volume of credit is very low. This offers a counterpoint to the literature on the gender digital divide and has implications for national policies aimed at promoting lending to small firms and women. It is of particular relevance to countries in Asia and Africa, where the uptake of informal finance is particularly high among women, and fintech may offer an attractive alternative.

2. MOTIVATION AND A WORD ABOUT THE GENDER DIGITAL DIVIDE

This study was originally motivated by a particular finding in the 2016 Asian Development Bank (ADB) survey of 791 trading firms. In line with existing evidence, woman-led firms involved in cross-border trade are smaller, less profitable, and report greater difficulties securing finance than the general population of trading firms. Yet, when asked about their use of fintech, women-led trading firms report much higher uptake rates than the general population. This goes very much against what we know about the gender digital divide.

Globally, the gender digital divide represents the additional barriers women face in accessing and using technology. It stems from a number of factors including control of resources, social norms, a lack of digital literacy, and access to the Internet and mobile phones (see, for example, GSMA 2015). The fact that this digital divide is not reflected in rates of uptake of fintech, which often has digital components, is surprising.

On top of this, additional barriers to fintech faced by women include a lack of financial identification documents, lower financial independence, less financial literacy, greater risk aversion (Powell and Ansic 1997), and sociocultural norms preventing women from accessing financial services (Ongena and Popov 2016).

Evidence tells us that the drivers of the gender gap in the credit market may be rooted in firm characteristics (Arrow 1973) or lender preferences (Becker 1957). Loan requests from small and medium-sized enterprises (SMEs) are more often rationed as a consequence of low company ratings and insufficient collateral. More importantly, it has generally been found that woman-owned firms are less likely to obtain finance and more likely to pay higher interest rates than their male-owned peers (Muravyev et al. 2009; Alesina et al. 2013; Presbitero et al. 2014). Such challenges also apply to trade finance.

Fintech encompasses a wide variety of financial instruments related to financial technology. In the context of this paper, we adopt the general definition of fintech as providers of capital that use digital platforms. Examples include peer-to-peer (P2P) lending and crowdfunding (see BIS 2017 for additional detail).

The differences between bank finance and fintech can be established by looking briefly at P2P lending. P2P lending involves an online platform where individuals can post information to attract unsecured direct loans from lenders without the intermediation of any financial institution. The platform allows borrowers to post their loan requests and lenders to search for requests linked to their interests. Lenders and borrowers are largely matched on their own, not through a formal intermediary. The intermediary

is the online lending website, which records transaction data that can be used for analysis. These online platforms lower transaction costs, which increases the feasibility of making microloans. Borrowers can combine numerous small loans to fund larger projects.

This lending model incorporates information asymmetry between lenders and borrowers. To mitigate this, the online platforms require online authentication and allow borrowers to demonstrate their creditworthiness through disclosing their financial and personal information to develop trust between the users (Chen et al. 2016; Feng et al. 2015).

The first online P2P lending platform, Zopa, was established in the UK in 2005. Since then, the model has experienced significant growth in many other countries such as the US, Denmark, Japan, and the People's Republic of China (PRC) (Feng et al. 2015). In 2016, lending in the P2P market resulted in more than $4 billion (Flynt 2016).

Table 1: Comparison of P2P Lending and Traditional Loan Financing

Major Differences	P2P Lending	Traditional Loan Financing
Interest Rate	Low-Medium	Medium-High
Loan Amount	High	Low
Collateral/Endorsement	Yes	No
Party Involved	Borrower, Bank	Borrower, Lender, Platform
Regulation/Supervision	Strict	Loose
Process	Complex, Long	Simple, Fast
Risk	Low	High
Transaction Cost	High	Low

Source: Feng, Fan, and Yoon (2015).

The relationship between fintech and traditional trade finance is evolving. While a recent ADB report shows that about 38% of fintech users also use trade finance (ADB 2017), this does not appear to be competing with bank-intermediated trade finance. In fact, the 2017 ICC Banking Commission survey reports that only 1.4% of banks felt that fintechs were a threat to their position as providers of trade finance (ICC 2017).

3. ACCESS TO FINANCE FOR TRADE: TRADITIONAL, INFORMAL, AND FINTECH

Empirical evidence has consistently shown that SMEs are excluded from traditional financial channels. This makes it difficult for them to access the capital they need to increase employment and production, and grow their firms. It is also understood that woman-owned firms face these plus additional barriers related to ownership of capital and childcare that even among the excluded population of SMEs make access to finance more difficult.

The literature on access to credit by woman-owned firms tends to focus on entrepreneurs or micro-sized firms (e.g., Alesina et al. 2013; Brana 2013). These firms face credit constraints but not higher interest rates once they have obtained credit (Asiedu et al. 2013; Bellucci et al. 2010).

Our data confirm that woman-led firms lack access to basic banking services that are needed to grow their firms. In this section, we go that one step further to show that

even after woman-led firms secure banking access and typical financial instruments like working capital, they face a second level of exclusion. This occurs when they have begun to export and apply for trade finance. Among SMEs that apply for trade finance, woman-owned firms are more likely to be rejected (Table 4).

There is one important caveat to these levels of exclusion – the data do not show that financial institutions are gender-discriminating. There is no evidence that banks are rejecting woman-owned firms because they are owned by women. Rather, the full effect is the result of firm characteristics of woman-owned firms.[2] This is in line with findings on productivity differences between male- and woman-owned firms. The literature shows that these are the result of unequal access to productive resources (see, for example, Blackden and Hallward-Driemeier 2013). Now we turn to the empirics.

To explore the existence of a gender gap in trade finance, we use two sources of data. One is the World Bank Enterprise Surveys (WBES) over the period 2006–2016, which cover indicators assessing firms' bank accounts, credit lines, and loan requirements, among other indicators. While the surveys do not explicitly refer to access to trade finance, we use exporters' applications for normal finance as a proxy.

The other is the Asian Development Bank (ADB) Company Survey on Trade Finance, which has endeavored to identify trade finance gaps since 2014. The survey captures firm characteristics, hindrances to trade finance, and firm behavior when seeking alternative financing instruments. Each wave of the survey has a unique population, and questions related to gender are included in the 2016 and 2017 surveys. Therefore, our analysis will focus on these survey years.

3.1 Exclusion Level I: Access to Basic Financial Services

The World Bank Enterprise Surveys collect detailed information on firm performance, demand for financing, and firms' relationship with banks. The sample includes exporters of all sizes from 139 countries. Of these firms, 24% report the participation of at least one women in the ownership structure. An additional 7% are female-owned, in which all or the majority of the owners are women. We include both categories in the analysis as "woman-owned."

Table 2 compares the characteristics of women- and male-owned businesses. Woman-owned firms (WOFs) are more likely to be small-sized and trade-dependent. Among small firms, the proportion owned by women is twice that of their male counterparts. Direct exports account for 53% of sales among woman-owned exporters, which is 6% higher than male-owned firms. Some 39% of companies applied for lines of credit or loans. There were no pronounced differences between ownership categories in the outcome of their applications. For nonapplicants, the main reason lies in unfavorable interest rates. But the two groups view their constraints differently, e.g., more WOFs regard high collateral requirements as the major barrier.

[2] This does not mean that there are no cases where bank officers gender-discriminate. However, for the global data set the effects are absorbed by firm characteristics.

Table 2: Comparison of Firm Characteristics

Variables	Definition	Mean			
		Full Sample	Male-owned	Female-owned	Difference
Firm Characteristics					
dexport	Direct exports as % of sales	43.22	46.19	52.64	***
logsale	Log form of annual sales in the last year	17.98	17.88	16.96	***
small	# employees < 20	0.19	0.23	0.39	***
medium	# employees 20–99	0.35	0.35	0.37	
large	# employees 100 and over	0.46	0.42	0.25	***
Demand for Credit					
apply	if applied for lines of credit or loans	0.40	0.66	0.63	
rationed	If the application for credit was rejected	0.04	0.04	0.04	
Reasons for not applying for loans					
noneed	No need for loans	0.68	0.66	0.63	
complexity	Complex application procedure	0.06	0.07	0.07	
price	Unfavorable interest rates	0.11	0.12	0.14	
collateral	Collateral requirements were too high	0.05	0.05	0.09	***
maturity	Insufficient loan size and maturity	0.02	0.03	0.01	*
discouraged	Did not think it would be approved	0.02	0.02	0.02	
Relationship with the bank					
overdraft	if the firm has an overdraft facility	0.59	0.55	0.43	***
line	if the firm has a line of credit or a loan from a financial institution	0.53	0.43	0.38	**
% Working capital funded by					
internal	Internal funds or retained earnings	62.94	65.46	63.71	
banks	Private and stated-owned banks	19.32	19.36	16.34	***
fins	Financial institutions	1.79	2.25	3.28	**
supplier	Credit from suppliers and advances from customers	13.03	9.72	10.52	
informal	Moneylenders, friends, relatives, etc.	2.99	3.48	6.32	***
Access to Finance					
difficulty	Degree of difficulty in gaining access to finance	1.37	1.28	1.31	

Note: The asterisks, *, **, and ***, denote significance at the 10%, 5%, and 1% levels, respectively.
Source: World Bank Enterprise Surveys, multiple years.

To understand firms' relationships with banks, we look at credit lines and working capital loans. WOFs have a lower share of both overdraft facilities and loans. The gap also exists in working capital. On average, the working capital funded by banks is lower for woman-owned exporters, at 16% versus 19%. While this suggests that male-owned firms have a better relationship with the bank, we also see that WOFs have fewer difficulties in gaining access to other financial institutions and informal financing resources such as moneylenders, friends, relatives, etc.

Overall, there are gender gaps in the borrower-lender relationship. But we cannot conclude that woman-owned exporters are more prone to being rationed by banks simply because of their gender. This is in line with other findings in the literature, though the results reported in the literature are not consistent. In a study of loan renewals for small businesses owned by white women or minorities, Asiedu et al. (2012) find that businesses owned by white women do not face higher rejection rates

on loan renewals (i.e., once the lender has information about them from a previous period).[3] However in a study of credit to micro-sized firms, Alesina et al. (2013) find that even after controlling for firm characteristics, women paid more for overdraft facilities.

3.2 Exclusion Level II: Access to Finance for Trade

Once a firm becomes competitive and productive enough, it may transition from servicing only the domestic market to selling internationally. However, this move requires capital – not only to find buyers and learn how to meet international quality standards, but also to finance trade. If a firm is unknown, the buyer will require an intermediary to finance and guarantee the transaction – this is the main function of trade finance.

Trade finance is a bank-intermediated instrument facilitating cross-border commerce. Although it has short-term, self-liquidating, and low-risk features, the approval of an application is still influenced by the riskiness of the firm. Banks may treat male- and woman-owned enterprises differently due to their creditworthiness (Agier and Szafarz 2013). The difference between the two groups might suggest that women-led enterprises face more obstacles in the credit market. But gender does not necessarily impact the decision-making of banks.

The idea of a second level of discrimination is related to the fact that firms that are applying for trade finance already have a banking relationship. Thus, the role of information asymmetry should play less of a role. Our approach to this question is most closely related to a study by Asiedu et al. (2013), who looked at loan renewal applications. The idea was that for renewals, banks already had information about borrowers and would not reject based on information asymmetries. They found this was true for women but not for many minority-owned firm groups.

We use two waves of the ADB Company Survey on Trade Finance. The 2016 wave includes 791 companies from 98 countries, while the 2017 wave includes 1336 firms from 103 countries. The majority of the firms are small and medium-sized and one-third are in the manufacturing sector. Approximately half of them are woman-owned businesses, which are mostly micro and small enterprises. Table 3 details where woman-owned firms stand apart.

Table 3: Gender Characteristics of Trade Finance

Variables	Description	MLFs	WLFs	Mean Difference
Apply	If applied for TF	0.50	0.47	0.03
No need	If TF is required for trade activity	0.43	0.37	0.06*
Discouraged	If TF is required but did not apply	0.08	0.18	–0.10***
Rationed	If rejection rate > 0	0.74	0.87	–0.14***
TF Gap	Rejection rate	34.91	45.45	–10.54***

The asterisks, *, **, and ***, denote significance at the 10%, 5%, and 1% levels, respectively.

Source: ADB trade finance survey 2016 and 2017.

[3] It is important to note that the “woman” category is restricted to include only white women. Minority women would have been slotted into minority-owned business categories.

The share of total business relying on trade is higher for WOFs, which accordingly require more trade finance. Applications for trade finance were equally distributed among gender groups. However, women-led firms are 10% more likely to be discouraged. In other words, they need trade finance but do not apply for it. This confirms the results shown in the credit discrimination literature (e.g., Freel et al. 2012).

Trade finance shortfalls arise when firms have insufficient collateral and a weak relationship with the banking sector, and lack bank trust. The gap increases when the exporter is a woman. Almost 87% of trade finance transactions are rationed for women exporters, compared with male entrepreneurs who are 14% lower. Among the reasons for denial, female exporters are more often rejected due to insufficient collateral or no past relationship with financial institutions. Also, application documentation is more important for female exporters in obtaining trade finance. This is probably because incomplete and unacceptable documents may influence a bank's perception of the enterprise.

Table 4: Reasons for Rejection in Trade Finance

Variables	MLFs	WLFs	Mean Difference
Insufficient collateral	0.25	0.42	–0.17***
Poor documentation	0.09	0.16	–0.07***
No past relation with banks	0.20	0.22	–0.02
Insufficient credit history	0.06	0.17	–0.10***
High country risk	0.11	0.12	–0.01
AML/KYC	0.03	0.03	0.01

The asterisks, *, **, and ***, denote significance at the 10%, 5%, and 1% levels, respectively.
Source: ADB trade finance survey 2016 and 2017.

3.3 Informal and Fintech

Let's take a deeper look at this second level of exclusion, and what it means for firms. We know that woman-owned firms and SMEs are more likely to be rejected by formal financial institutions. But there are other ways of financing a trade transaction. Self-financing is one, friends and family (informal) is another.

Once a trade transaction is rejected by a bank, the data show that 41% of all surveyed firms seek alternative sources of finance either in the formal or informal sector. Woman-owned firms are about 10% more likely to seek alternative financing. However, while male-led firms are more likely to find formal sources of financial alternatives, woman-led firms are more likely to identify informal sources of finance. A third of WOFs report using informal financial providers.

While fintech is not specified as an "alternative," there is a separate question about the use of fintech by trading firms. According to the 2017 survey, 38% of firms that use fintech also use bank finance. This suggests that it is being used by these firms as a diversification strategy or to supplement insufficient trade finance. Among users of fintech, in 2017, most (77%) are woman-owned firms. This result is in the same direction as the 2016 survey year.

Table 5: Usage of Informal Finance

Dep. Var.: Digital User	(1)	(2)	(3)
femaleown	0.35***	0.34***	0.36**
	(0.10)	(0.10)	(0.15)
foreign		0.27	1.02***
		(0.22)	(0.27)
firmsize		–0.13**	–0.15*
		(0.05)	(0.09)
rejectionrate			0.00
			(0.00)
insufficient collateral			0.15
			(0.24)
poordoc			0.05
			(0.20)
no bank relation			0.29*
			(0.17)
poor credit history			0.33*
			(0.20)
high country risk			–0.22
			(0.22)
amlkyc			0.32
			(0.39)
Constant	–0.69***	–0.51***	–0.90**
	(0.09)	(0.14)	(0.36)
Country level income	Yes	Yes	Yes
Obs	960	959	330

Standard errors in parentheses.

The asterisks, *, **, and ***, denote significance at the 10%, 5%, and 1% levels, respectively.

4. EVIDENCE OF SUPPLY-SIDE DISCRIMINATION

The above sections have shown that woman-owned enterprises are unconditionally less likely to obtain bank finance and face higher rejection rates. But the underlying drivers of these shortfalls are still in question. To explore this issue, we empirically assess whether the gender gap still exists when controlling for a firm's characteristics.

There are two parts to this question. The first is whether there is a gender-specific component to banks' rejections of women-owned firms' applications for trade finance. But there are other ways to obtain finance. Fintech, for example, is rapidly gaining attention as a way to finance SMEs that fall into the finance gap. Favoring SMEs might also indirectly favor women. In the second part of this section, we look at the literature to see whether it supports the idea that there is positive discrimination for women-owned firms in fintech.

4.1 Are Banks Rejections Based on Gender?

The access gap that exists between women- and male-led firms on the aggregate level narrows with productivity and firm size. In Table 3, we saw that women-led firms face rejection rates for trade finance that are about 10% larger than men. But this does not control for the types of firms that are run by women.

Table 6: Gender and Trade Finance

	Prob (Application)			Rejection Rate		
	(1)	(2)	(3)	(1)	(2)	(3)
wlf	–0.05	–0.11	0.03	15.84***	12.84***	6.68
	(0.07)	(0.08)	(0.09)	(4.66)	(4.42)	(4.62)
logsale		0.03	0.06***		–3.35***	–2.59***
		(0.02)	(0.02)		(0.95)	(0.82)
foreign		0.01	0.11		21.98**	21.07**
		(0.23)	(0.23)		(10.12)	(9.07)
firmsize		0.04	0.10		–4.75	–2.94
		(0.06)	(0.08)		(3.18)	(2.66)
insufficient collateral			0.32***			27.54***
			(0.09)			(4.44)
poordoc			0.13			5.12
			(0.15)			(6.09)
no bank relation			0.01			12.32***
			(0.15)			(4.43)
poor credit history			0.33***			15.58**
			(0.11)			(6.92)
high country risk			0.13			10.46*
			(0.14)			(6.25)
amlkyc			–0.28			–18.86
			(0.29)			(12.16)
constant	0.48***	0.11	–0.38	40.83***	91.92***	56.76***
	(0.16)	(0.27)	(0.33)	(8.29)	(12.04)	(12.39)
Country income level	Yes	Yes	Yes	Yes	Yes	Yes
Obs	1,065	902	637	366	320	309

Standard errors in parentheses.

The asterisks, *, **, and ***, denote significance at the 10%, 5%, and 1% levels, respectively.

To test how gender would affect the attainability of trade finance conditional on firm characteristics, we estimate the following regression:

$$Y_i = \beta_0 + \beta_1 Female_i + \boldsymbol{X}_i \alpha_1 + \boldsymbol{Z_i} \alpha_2 + \epsilon_i$$

where Y_i denotes either firm i's demand for trade finance or the result of application. Demand is measured as a dichotomous indicator that takes the value of one when the i-th firm applies for trade finance and zero otherwise. The result of application is captured by the proportion of rejected requests. $\boldsymbol{X}_i$ is a vector of controls, comprising firm size, annual sales, and reasons for being rationed. The reasons are dummy

variables, including insufficient collateral or guarantee, unsoundness of the proposal, inability to fulfill all documentation requirements, the lack of a business relationship with financial institutions, a poor company record, high-risk country rating, and banks' AML/KYC requirements. Country-level characteristics are captured by Z_i. A probit model is used to examine the likelihood of application between gender groups. Note that 20% of the applicants were not rationed, i.e., zero rejection rate. Taking account of zeros, we use a Tobit model to assess the impact of ownership on rejection.

We might expect that among exporters – who all have access to a bank and are among the most competitive firms – this gap would be negligible. However, even among the most productive WLF exporters, a gap remains in their access to trade finance, which is a critical enabler of trade.

On the other hand, there is a statistically significant difference in access to financial institutions between exporters and domestic firms. When comparing women-led exporters with their male-led counterparts, little gap is found in access to financial institutions. This finding indicates that access to financial institutions in general is more likely to depend on firms' characteristics, especially whether they are exporters or importers, rather than gender effects.

4.2 Do Fintech Providers Prefer to Lend to Women?

The question about fintech uptake among women-owned firms is one that has received almost no attention in the literature. The work that has been done focuses on the lending side rather than the borrower side. In addition, outcomes are mixed. Since we focus on P2P lending in this paper, we look into that literature specifically. Because users of P2P lending platforms face considerable information asymmetry between borrowers and lenders, one of the central research questions of recent studies is what factors influence a lender's behavior and what contributes towards making bidders more or less successful on the platform.

Most studies of P2P lending use US or European data and find no evidence that the gender of the borrowers affects lender behavior (see, for example, Herzenstei et al. 2008; Barasinska and Schäfer 2010; Barasinska 2011). However, there is also evidence that the physical appearance of borrowers increased their likelihood of obtaining a loan (Ravina 2008), and of paying less interest (Pope and Sydnor 2011).

Studies looking at PRC-based P2P platforms are also mixed. Chen et al. (2013) found that female borrowers were less likely to be funded, while Feng et al. (2015) found that lenders preferred both female borrowers and older borrowers. Thus, from existing work, we cannot conclude that the supply side of fintech has a strong gender differential.

Although our findings demonstrate that fintech plays more of a role for WOFs than it does for firms that are owned by men, more research is needed to understand this relationship. What is clear is that such alternative finance options have become part of the solution to ensuring that this underserved exporting population's financing needs are met.

What does this mean for trade finance? It remains to be seen how traditional trade finance will respond to the challenge of digital financing in serving the needs of its borrowers. Already, institutional investors, corporates, and banks are experimenting with online platforms, crowdfunding, and peer-to-peer or marketplace lending. It is clear that the importance of digital financing is being recognized.

5. CONCLUSION

To answer the questions posed in the introduction, we employed two different data sets that offered insight into the experience women traders face in accessing the finance they need to export. Our objective was to extend the literature on access to finance and the importance of financial characteristics of a firm. Financial health positively impacts the probability of being an exporter (Berman and Hericourt 2010), while credit rationing greatly decreases it (Minetti and Zhu 2011); liquidity improves the number of new export destinations (Forlani 2010), while financially dependent firms have lower export growth rates (Bricongne et al. 2012).

Questions about gender discrimination in credit access are nothing new (see e.g., Buttner and Rosen 1988; Coleman 2000). But exploration of the secondary level of discrimination for traders is.

We confirm that woman-owned firms face greater barriers to access to finance than the general population. This occurs first at the level of basic access to finance. The ADB data further show that women exporters own firms with characteristics that lead to rejection of their trade finance applications even though they have secured a banking relationships. The data show that this is driven by the characteristics common to firms owned by women.

This suggests two policy points. First, trade facilitation efforts can incorporate gender goals by targeting firms with the characteristics common to woman-owned firms. Second, requiring banks to lend to women may not solve the access problem. Lending practices incorporate collateral deposits and credit assessments that these firms have difficulty meeting. A more effective policy would be to reconsider how credit assessment is done – for example, using some of the practices increasingly common in the fintech space. In terms of collateral, moveable assets can be considered to which women-led firms are more likely to have access.

We also raise the issue of whether technology-enabled finance is the solution to underserved exporting populations. This has gained a great deal of attention since the global financial crisis. But there is limited evidence to support this. Most available research focuses on what influences the behavior of lenders. In contrast, our analysis highlights gender patterns in exporting firms' engagement with fintech. WOFs are more likely to use fintech platforms to obtain finance, after being rejected by traditional banks for trade finance.

The bottom line is that trading firms owned by women face additional hurdles in financing their exports. The main problem is not access to a financial institution – all the firms in this study are banked – but rather securing capital with the existing resources at their disposal. Looking through this lens, it is no surprise that woman-owned firms seek alternatives more aggressively after rejection and are more likely to secure capital through a fintech platform. This suggests that the novel credit assessment mechanisms we see coming out of the fintech sector may be a reasonable starting point for extending access to trade finance among this population.

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APPENDIX

Summary of Literature on P2P Lending and Gender

Authors	Name of Article	P2P Lending Platform Analyzed	Findings
Herzenstei, Andrews, Dholakia, and Lyandres (2008)	The democratization of personal consumer loans? Determinants of success in online peer-to-peer lending communities	Prosper.com (US)	• Did not find gender to have a powerful effect on Prosper.com lenders. • P2P lending platforms are more democratic and less discriminatory then traditional platforms. • Most influential variables were the amount of personal information borrowers provided and their credit grades.
Ravina (2008)	Love & loans: The effect of beauty and personal characteristics in credit markets	Prosper.com (US)	• Analyze how lenders use information about aspects of borrowers' appearance, such as ethnicity, gender, and attractiveness, when lending. • Women are more likely to be considered beautiful and trustworthy, but, interestingly, not creditworthy, • The beautiful receive favorable treatment in this market.
Pope and Sydnor (2011)	What's in the picture? Evidence of discrimination from Prosper.com	Prosper.com (US)	• Single women pay 0.4% less interest than men even though the estimated return on loans to single women is approximately 2 percentage points less than for single men. • Significant racial discrimination. Listings with black people in the picture are 2.4–3.2 percentage points less likely to be funded.
Barasinska and Schäfer (2010)	Does gender affect funding success in the peer-to-peer credit markets? Evidence from the largest German lending platform	Smava.de (Germany)	• Gender does not affect borrowers' chances of funding success. • Gender discrimination is linked to platform-specific phenomena rather than a common attribute of P2P credit markets.
Barasinska (2011)	Does gender affect investors' appetite for risk? Evidence from peer-to-peer	Smava.de. (Germany)	• No evidence of gender differences in investors' risk propensity. • Significant gender differences in investors' tastes are found only with respect to preferred investment duration, purpose of investment project, and borrowers' age.
Chen, Hao, and Xu (2013)	Gender discrimination towards borrowers in online P2P lending	PPdai.com (PRC)	• Gender was influential. • Female borrowers were less likely to be funded than male borrowers, although their default rates were lower and the authors suspected that this was due to prejudice rather than rational reasoning.
Chen, Li, and Lai (2016)	Gender discrimination in online peer-to-peer credit lending: evidence from a lending platform in the PRC	PPdai.com (PRC)	• Found gender discrimination, both in favor and against female borrowers. • Although the majority of the users were male, female borrowers were 33% more likely to be funded than male borrowers and were therefore preferred by lenders. • However, although female borrowers were 52% less likely to default on their loan repayments, they still had to pay higher interest rates than male borrowers.
Feng, Fan, and Yoon (2015)	Lenders' and borrowers' strategies in online peer-to-peer lending market: An empirical analysis of PPDai.com	PPdai.com (PRC)	• Information related to a borrower's credit is very influential. • Both gender and age also matter to lenders. • Lenders prefer both female borrowers and older borrowers, over the age of 31.