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Escape Through Export? Women-Owned Enterprises, Domestic Discrimination, and Global Markets

Iain Osgood[†] and Margaret E. Peters[‡]

Abstract

Does globalization provide an escape from discriminatory legal and social institutions for women-owned enterprises? We develop an original test of this proposition based on a model of firm heterogeneity with discriminatory costs. Discriminatory institutions raise barriers to entry and increase costs of production, allowing only the most productive women-owned firms to survive. If the costs of discrimination are lower in export markets, the average surviving woman-owned firm is more likely to export and exports a higher proportion of total sales. Using a cross-national dataset of firms, we show that while there are significantly fewer women-owned enterprises in countries with discriminatory institutions, these businesses export at higher rates. Global markets therefore provide an important, albeit imperfect, alternative to markets with poor protections of women's rights.

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Does globalization reduce or reinforce inequality between men and women? This paper examines one type of globalization — trade openness — and its effects on a particular group — women entrepreneurs in developing countries. Women entrepreneurs face a host of problems when starting and running a business. Women often face discriminatory institutions that affect their ability to enter the market: they are not able to obtain the same level of human capital as men;¹ they face norms that unduly burden them with domestic tasks and care giving;² they can face norms against entrepreneurship³ and legal bans on property ownership;⁴ and they are less likely to get government or private financing for their businesses.⁵ Once in business, women-owned firms often have higher costs of doing business: women face stereotypes about their ability to run a business that can affect their relationships with other entrepreneurs,⁶ with their workers,⁷ and with customers;⁸ they have smaller, less developed professional networks to draw upon;⁹ they may face difficulties safely moving about the country to visit their factories, suppliers or buyers;¹⁰ and they are less likely to get government support or credit to grow their business.¹¹

Discriminatory institutions, then, affect the number and type of both female and male entrepreneurs who are able to enter the market. Only women who can start and run highly productive firms consider starting a business. There will be, then, fewer women-owned enterprises (henceforth, *WOEs*) than there would be without these institutions but these firms have higher underlying levels of productivity. In contrast, because there is less competition there are more men-owned enterprises (henceforth, *MOEs*) but these firms have lower levels of underlying productivity.

When firms from states with highly discriminatory institutions turn to global markets their fortunes may change. *WOEs* may be able to access markets with fewer discriminatory

¹ Baughn, Chua and Neupert (2006) (citing Brush (1997)); Della-Giusta and Phillips (2006); Humphreys and McClung (1981); Langowitz and Minniti (2007); Minniti and Naudé (2010).

² Kim and Ling (2001); Lee (2005); Loscocco and Robinson (1991); Pillai and Amma (2005).

³ Ahmad (2011*b*); Javadian and Singh (2012); Pillai and Amma (2005); Sadi and Al-Ghazali (2010).

⁴ Kantor (2002); Pillai and Amma (2005).

⁵ For research on discrimination in financing see: Agier and Szafarz (2011); Alesina, Lotti and Mistulli (2013); Buttner and Rosen (1989); Coleman (2000); Fay and Williams (1993); McKechnie, Ennew and Read (1998); Blanchard, Zhao and Yinger (2008); Orser, Riding and Manley (2006); Verheul and Thurik (2001). For research on a lack of government support see: Ahmad (2011*b,a*); Dechant and Lamky (2005); Loscocco and Robinson (1991); Ufuk and Özgen (2001). For research on discrimination by the state, see: Ahmad (2011*b,a*); Javadian and Singh (2012).

⁶ Baughn, Chua and Neupert (2006); Bliss, Polutnik and Lisowska (2003); Dechant and Lamky (2005); Hisrich and Fulop (1994); Javadian and Singh (2012); Lee (2005); Roomi and Parrott (2008); Pillai and Amma (2005); Still and Timms (2000); Still (2005); Weiler and Bernasek (2001).

⁷ Kolvereid, Shane and Westhead (1993); Roomi and Parrott (2008).

⁸ Javadian and Singh (2012).

⁹ Ahmad (2011*b,a*); Dechant and Lamky (2005); Della-Giusta and Phillips (2006); Hisrich and Fulop (1994) (cited in Bliss, Polutnik and Lisowska (2003)); Javadian and Singh (2012); Pillai and Amma (2005).

¹⁰ Ahmad (2011*b*); Dechant and Lamky (2005); Roomi and Parrott (2008); Sadi and Al-Ghazali (2010).

¹¹ See above.

barriers than at home, avoiding at least some of the worst impacts of discrimination. On the other hand, exporting may provide no relief from discrimination if the costs of discrimination are primarily determined by the country where production is located. It could also be that domestic discrimination *especially burdens* export activities, for example, by restricting access to finance or shrinking business networks, which are both particularly important to exporters. We adjudicate among these possibilities by formally developing an empirical test for when export markets provide an escape from discrimination at home.

Our test of whether discrimination at home may be escaped through exporting relies on the selection effects created by domestic discrimination in a world of firm heterogeneity. Because domestic discrimination selects for the most productive WOE, those firms which remain in production may be better able to cover the extra costs of exporting than their less productive male counterparts. But this will hold only if some costs of discrimination can be avoided when exporting, in which case we expect to see a higher proportion of WOE exporting, and that they would export more on average than their male counterparts. If, on the other hand, discrimination is especially costly for export sales, we expect to see a lower proportion of WOE exporting in the most discriminatory countries and that they would export less as a proportion of total sales. This focus on discrimination-generated selection effects builds on Anzia and Berry (2011) and Becker (1957), among others, and shares their focus on observable implications of discrimination rather than the direct measurement of discrimination itself in all its costs and consequences.

We formally develop this basic insight into a set of testable hypotheses, extending a model of firm heterogeneity and trade developed by Melitz and Ottaviano (2008). We then use country- and firm-level data to test our hypotheses. We document large, negative effects of discriminatory social and legal institutions on rates of business activity by women using a cross-sectional dataset covering over 100,000 firms in 128 countries.¹² While discrimination reduces the numbers of women exporters and non-exporters, our test confirms the possibility of escape through export. In countries with the most discriminatory institutions, the proportion of WOE which export is higher than MOE; they also export more as a proportion of total sales, and export more, on average. For WOE in countries with the highest rates of discrimination, then, exporting provides some relief from the negative impacts of domestic discrimination on their business.

This paper makes several contributions to the literatures on trade, globalization and discrimination. First, while the literature has examined how globalization may affect discriminatory institutions and improve women's rights and lives,¹³ and how globalization

¹² Firm-level data is from the World Bank Enterprise Surveys (World Bank, 2013a). The primary measure of institutions is the Social Institutions and Gender Index (OECD, 2013).

¹³ Apodaca (1998); Black and Brainerd (2004); Balamoune-Lutz (2007); Richards and Gelleny (2007). These changes might occur because of economic development (Poe, Wendel-Blunt and Ho, 1997; Eastin and Prakash, 2013); the spread of norms (Kittilson and Sandholtz, 2006; Keck and Sikkink, 1998); or through the creation of an international legal regime governing women's rights (Simmons, 2009; Kittilson and Sandholtz, 2006; Hill, 2010).

affects women in the labor market,¹⁴ this paper raises a crucial question about globalization and WOE's which has not been examined systematically: does accessing export markets improve or exacerbate the negative effects of discrimination?¹⁵ If home market sales are those most affected by bad institutions, then globalization is an 'escape hatch' for women entrepreneurs from markets with bad institutions. However, if bad domestic institutions especially harm the activities of exporters, then further globalization may deepen inequality and entrench discrimination. This paper finds that the former is more likely than the latter, and so helps explain the positive association between globalization and gender equality (Richards and Gelleny, 2007; Kittilson and Sandholtz, 2006).

A second key contribution of this paper is to quantify the negative impact of discrimination. In this task, it follows other cross-national studies, including Brush (1990), McClelland et al. (2005), Baughn, Chua and Neupert (2006), and Kolvereid, Shane and Westhead (1993). However, the data used here, in terms of number of observations and countries, is much richer than the existing studies, and the focus on comparing domestic with export performance sheds new light on the study of institutions, entrepreneurship, and globalization. An important theme here is that the impact of country-level institutions depends on global context, particularly the social institutions in trade partners and the trade openness of the system as a whole.

This paper also clarifies a set of findings in the literature on WOE's and firm performance. While rates of entrepreneurship among women are consistently lower in virtually all countries, several studies have found few differences in performance between women- and men-owned firms as measured by sales and profits (Du Rietz and Henrekson, 2000; Kepler and Shane, 2007). We argue that any research design which examines average differences in performance is likely underestimating the negative effects of discrimination because of firm attrition. We show formally that the negative effects of discrimination are obscured by firm exit: greater discrimination diminishes the profits of all WOE's and pushes the most inefficient firms out of business, apparently leaving the distribution of revenues among WOE's unchanged relative to men-owned firms. Accounting for the lost sales of exiting firms and those who never entered in the first place – neither of whom are visible in the data – is crucial for a complete accounting of the costs of discrimination.

Finally, this research has several normative implications. Trade liberalization by the

¹⁴ On the links between trade and employment prospects for women, see Bussmann (2009); Fontana and Wood (2000); Standing (1989); Ward et al. (2004); Wright (1995). On the gender wage gap and globalization, specifically, see Artecona and Cunningham (2002); Berik, Rodgers and Zveglic (2004); Black and Brainerd (2004). The impact of FDI on labor opportunities is examined in Acker (2004); Mills (1999); Pyle (2006); Singh and Zammit (2000).

¹⁵ Single-country studies which dominate the literature are concentrated in a small selection of (mostly developed) countries but generally find that WOE's are less likely to export than men-owned enterprises (Grondin and Schaefer, 1995; Orser et al., 2010; OECD, 1998; Westhead, Wright and Ucbasaran, 2001). For exceptions, see Spence, Orser and Riding (2011) and Grondin and Grondin (1994).

OECD countries may provide a way of redressing gender inequalities in countries where discrimination against women is great. To the extent that globalization provides new and less burdened economic opportunities to WOE's in countries with significant discrimination, increased international exchange may reduce gender disparities in entrepreneurship and income. This provides an original normative rationale for unilateral trade liberalization by the developed world with the developing world. Perhaps more importantly, this paper documents the enormous costs associated with discrimination as measured in lost businesses and lost enterprise. Discriminatory institutions and weak protections of women's rights burden both non-exporters and exporters enormously, if not equally.

Theory

This section presents a formal treatment of all of the results which underlie our analysis of gender, institutions and firm performance. Before presenting the model, we first discuss an important premise of our argument: that exporting might either *decrease* or *increase* the discrimination-imposed costs faced by women-owned firms. We then discuss the selection effects which drive our approach in a non-technical manner before presenting the main results from an extension of the model of firm heterogeneity and trade developed in Melitz and Ottaviano (2008). The short-run version of the model is used here to develop a framework for thinking about two groups engaging in business both domestically and on export markets, one of which faces discrimination. A fuller presentation of the model equilibrium and proofs is contained in the online appendix.

Gender, institutions and entrepreneurship

This paper builds on a long-standing theme in the literature on labor discrimination and entrepreneurship: "Small-business ownership has always represented a potential escape route for frustrated employees. It is particularly attractive to members of disadvantaged groups whose opportunities as wage and salary workers are seriously limited" (Loscocco and Robinson, 1991). From this perspective, starting a business is a way to avoid discriminatory work cultures, especially for women in management positions confronting the glass ceiling (Baughn, Chua and Neupert, 2006; Kephart and Schumacher, 2005; Loscocco and Robinson, 1991; Loscocco et al., 1991; Mattis, 2005, 2004; Still, 2005; Weiler and Bernasek, 2001). Instead of considering discrimination in the labor market, however, this paper considers discrimination against entrepreneurs, and asks whether women-owned businesses can "escape", at least in part, the effects of discrimination in the home market by tapping into foreign markets as exporters.

Why would women-owned businesses be able to avoid domestic discrimination by serving foreign markets? To answer this question, we draw upon the very large literature on gender and entrepreneurship to understand the gender-specific challenges faced by women en-

trepreneurs. We consider three types of impacts created by discrimination: impacts which affect entrepreneurs' ability to start a business and their underlying productivity; costs of production which affect women-owned firms based on where they are producing; and, costs which affect women-owned firms based on which market they are serving.

Some forms of discrimination may affect women entrepreneurs' ability to open up shop or their underlying productivity. Many country studies have highlighted educational or entrepreneurial training deficits among women, which hamper the development of a business (Brush, 1997; Minniti and Naudé, 2010). Societal norms which discourage entrepreneurship also fall in this category. Discrimination that occurs *prior* to entrepreneurial activities is unlikely to differentially effect domestic competitiveness and competitiveness in export markets. Instead, it likely shifts the *a priori* productivity distribution of women-owned enterprises, and reduces the number of potential entrants, with negative consequences for both domestic and export sales alike. We refer to this type of discrimination as pre-production discrimination.

Other forms of discrimination affect the ability to produce after entry has occurred, but are also unlikely to depend on whether a firm is exporting or not. For example, difficulties in hiring workers or sourcing inputs in the home market and challenges associated with spatial mobility and property ownership are unlikely to differ in their effect depending on whether a firm is serving the home or foreign markets. We refer to these kinds of discrimination as location-determined discrimination, because they affect entrepreneurs primarily depending on their production location.

Finally, there are aspects of discrimination whose effects may depend on whether a firm is exporting or not. We refer to these forms of discrimination as market-based discrimination because their effects depend on which market is served. Expanding into export markets often requires borrowing to increase production, and so a lack of access to credit may be particularly damaging to women exporters. Similarly, exporters often rely on assistance from state agencies or financial institutions. In some countries and some industries, exporters need export licenses or to be included within export quotas which may be given out in a discriminatory fashion. Exporting, which often requires significant travel, may also be especially challenging in cultures where expectations about care for children and dependents are highest. Note that these types of discrimination arise mainly from the home market's institutions, whose negative effects are exacerbated by the special demands placed on exporting firms, but are still market-determined because they depend on which market is being served.

In contrast, exporting may generate a reduction in the relative discrimination faced by women-owned enterprises if they are able to access markets where discrimination is significantly lower than at home. This seems most likely in five areas. First, women entrepreneurs may encounter less stereotyping or bias from other businesses and customers when they engage export markets with lower levels of discrimination. Sales contracts, therefore, may be

easier to secure, less likely to be broken, and easier to see enforced if they are broken. Second, securing financial intermediation for transactions may be easier with foreign banks. Third, certain types of overt discrimination from foreign states, for example in certifying or licensing products for the market, may be lower. Fourth, exporters often engage foreign agents or wholesalers in order to navigate export markets, and these may level the playing field for women entrepreneurs who can be shut out of business or professional networks in countries with the highest levels of discrimination. Finally, exporters may be better able to hide their identity when working abroad; to the extent that other businesses and customers do not interact with the owner, but instead with a manager or with another agent, the owner's gender identity may play little role, meaning that WOE's "look" like MOE's abroad.¹⁶

Whether exporting places a special burden on women-owned enterprises or provides useful access to less discriminatory markets where the burden of discrimination is lower is the subject of this paper, and the literature does not support any *a priori* statement. What is crucial to note here, however, is that pre-production and location-based discrimination are observationally equivalent, and both produce reduced performance of women-owned enterprises in both home and foreign markets. Market-based discrimination, however, creates distinct observational implications based on whether discrimination is less burdensome – or especially burdensome – for export sales. We explore this formally in the next sections.

Outline of the argument

This paper focuses on three findings, which are illustrated in Figure 1. For this illustration, each gender is assumed to have an equal number of potential entrants *a priori*, represented by the two equal rectangles.¹⁷ The top third of the figure illustrates what would occur in the total absence of discrimination to provide context for the selection effects described below.

Discrimination generates extra costs for women-owned firms which push the least productive out of business, as illustrated by the larger number of dropouts among WOE's in the presence of discrimination. This generates our first main result: discrimination reduces the number of women-owned enterprises serving the domestic market. Note that this selection effect may mean that discrimination is unobservable if examining differences in average profits or revenues among groups. Women-owned firms have to be more productive to enter and succeed in the market, but discrimination pushes down profits and sales by creating extra costs, so surviving women-owned firms are observationally as productive as

¹⁶ A question that arises from this discussion is whether a fixed cost of production that is higher for WOE's than MOE's would constitute market-based or location-based discrimination. If there is no equivalent discrepancy in the fixed costs of exporting for WOE's and MOE's, then such a cost would be an example of market-based discrimination, in our parlance, because its effects are asymmetric across markets.

¹⁷ This assumption is not necessary for the development of the formal results, and is simply used here to facilitate illustration.

Figure 1: The Argument Illustrated: Selection Effects and Discrimination



men-owned firms although they are in fact intrinsically more productive, on average.

The second result applies this logic to foreign sales. Discrimination in the home and foreign markets makes it more expensive for women-owned enterprises to export. Both men- and women-owned firms face additional costs associated with exporting but note that women-owned enterprises have especially high costs due to discrimination. This implies that there are fewer women-owned firms that export than men-owned firms. In the case illustrated in the middle of the figure, the costs imposed on export activities by discrimination are relatively greater than in the case on the bottom. This generates our third outcome of interest: the observed proportion of women-owned firms that export is lower than the proportion of men-owned firms that export *if* discrimination's costs affect exporting more than they affect domestic sales.

The bottom of Figure 1 illustrates the converse case in which the burden of discrimination falls especially heavily on domestic sales. First, note again that both the number of

women-owned firms and of women-owned exporting firms is lower than of men-owned firms. But in this case, the impacts of discriminatory institutions are especially negative for domestic sales by WOE. This sharply reduces the number of women-owned enterprises while reducing the number of women-owned exporters comparatively less. (It also generates a large increase in the number of MOEs serving the domestic market, as domestic competition is weakened.) We therefore see that the proportion of remaining women-owned firms which export is greater than the proportion of men-owned firms, even though there are less women-owned exporters in absolute terms.

Our argument, then, is fundamentally a story about selection effects, and the observable implications of those selection effects across markets where the relative burden of discrimination differs. Our argument *is not* that discrimination improves the export performance of WOE. Indeed, quite the opposite: domestic discrimination significantly impedes the export performance of WOE. Rather, we find that the impacts of discrimination on export sales, while substantial, are not as harmful as on domestic sales for WOE located in the most discriminatory countries. Put another way, the costs of discrimination are especially great when serving markets where discrimination is the greatest. The following sections develop these ideas formally and provide precise conditions under which this escape through export pattern will hold.

Model components and assumptions

We construct a model of international trade and discrimination based on the short-run version of the model from Melitz and Ottaviano (2008). Two groups $g \in \{1, 2\}$ are located in market i (their home country) but also serve market j (the world). The home and world market are of size L^i and L^j , respectively. The second group faces discrimination which has five separate effects. We refer to the level of discrimination in country i with the parameter δ_i . There is a fixed number of potential entrepreneurs in country i from either group, given by N_{Ei}^g . The first major impact of discrimination is that it affects the number of entrants in group 2, that is, $\partial N_{Ei}^2 / \partial \delta_i < 0$. This can be thought of as discrimination which suppresses the quantity of potential entrepreneurs from group 2, regardless of their productivity.

Each entrepreneur l 's productivity is given by c_l , a cost drawn from a Pareto distribution with shape parameter k . The *ex ante* productivity distribution has positive support on $[0, m_i^g]$. Note that the upper bound of this distribution varies by group owing to discrimination. It is assumed that $\partial m_i^2 / \partial \delta_i > 0$, indicating that the *ex ante* productivity of any group 2 firm declines as discrimination increases.¹⁸ This second major effect of discrimination occurs, for example, where discrimination negatively impacts human capital formation or any other determinant of entrepreneurial ability.

Both of the preceding forms of discrimination occur prior to direct engagement with

¹⁸ For the sake of simplicity, we assume that the *ex ante* number and productivity of group 1 firms is unaffected by discrimination (but, of course, their equilibrium number and productivity will be).

the market and do not depend on which market is served, and so are pre-production discrimination in the schema outlined above; later, we discuss relaxing this assumption. Because many of the equilibrium outcomes are a function of $N_{Ei}^g / (m_i^g)^k$, we make use of the shorthand notation $A_i^g := N_{Ei}^g / (m_i^g)^k$ in some propositions, noting that $\partial A_i / \partial \delta_i < 0$. Finally, note that N_{Ei}^g (the number of potential entrants in i in group g) differs from N_{ii}^g (or N_{ij}^g), the endogenous number of firms that actually serve market i (or j) which is determined in equilibrium. Some potential entrepreneurs do not produce because they are insufficiently productive.

We now turn to our third impact of discrimination, which is that it raises unit costs of production and sales in the home market. τ_{ii}^g is a per unit variable cost of production for any firm located in market i and selling in market i whose owner is of group $g \in 1, 2$. (These costs multiply a firm's intrinsic cost of production c_i .) Some of these production costs may depend on the presence of discriminatory institutions, so we imagine that τ_{ii}^2 is increasing in δ_i . Analogously, the fourth impact of discrimination is that it raises costs of production and sales for the world market. τ_{ij}^g is the per unit total variable cost for exports, and may include trade, transport and discrimination-induced costs. This is also increasing in the domestic level of discrimination δ_i , but of course depends on discriminatory institutions in the world market, too.

In our schema above, both of these forms of discrimination have location- and market-based components. For example, the costs of exporting paid by group 2 firms (i.e. τ_{ij}^2) might arise from discriminatory institutions in country i which raise costs of sourcing, staffing, borrowing, and real estate. This is locational discrimination to the extent that such costs are equally present for domestic sales. But some costs of exporting are also driven by the extent of discrimination in the foreign market j , for example, due to stereotyping, foreign financial and business intermediation, and licensing and customs facilitation. Likewise, domestic discrimination might especially burden exporting and so increase τ_{ij}^2 more than τ_{ii}^2 . Both of these are market-based forms of discrimination. Note that export costs also have non-discriminatory components, such as shipping costs and trade barriers, which affect both groups equally. We imagine that these locational, market-based, and non-discriminatory components multiply together to generate the final summary parameter τ_{ij}^2 .

We permit discriminatory institutions in market i to impact firms which have production located in the rest of the world, that is, τ_{ji}^2 is increasing in discrimination in i . This represents the final impact of country i 's discriminatory institutions: foreign firms from group 2 are also prevented from entering the home market due to costs generated by its discriminatory institutions.

At this point, we present the full set of assumptions about the impacts of discrimination across the groups:

$$\frac{N_{ei}^1}{N_{ei}^2}, \frac{m_i^2}{m_i^1}, \frac{\tau_{ii}^2}{\tau_{ii}^1}, \frac{\tau_{ij}^2}{\tau_{ij}^1}, \frac{\tau_{ji}^2}{\tau_{ji}^1} \geq 1.$$

Discrimination deters entry and lowers the average productivity of firms in the second group. (These first two inequalities are not necessary for all of the results derived below, but are plausible.) Discriminatory institutions in country i also increase the relative costs for three types of group 2 firms. The first are domestic firms serving the domestic market. The second are domestic firms serving foreign markets (market $j \neq i$ in this notation). The third are foreign firms attempting to export into market i .

Using our notation from above, per unit production costs for firm l of group g located in market i and serving market j are given by $c_k \tau_{ij}^g$. c_{ij}^g defines a productivity cutoff above which sales in market j are zero. The proportion of firms serving the domestic market which also export is then given by $p_{ij}^g = (c_{ij}^g/c_{ii}^g)^k$. We assume that $p_{ij}^g < 1$ or that there are fewer exporters than firms producing exclusively for the domestic market, which is standard in the literature on firm heterogeneity.¹⁹ A complete description of the model equilibrium and cutoffs is provided in Appendix 1.

Revenue for an individual firm is R_{ijl}^g and average revenue for that firm's group is \bar{R}_{ij}^g . We define average export revenue somewhat differently than in the standard approach in the literature. Instead of considering average export revenues across only exporters, we consider average exporter revenues across all firms. For $i \neq j$,

$$\begin{aligned}\bar{R}_{ij}^g &= p_{ij}^g \left(\frac{L^j}{2\gamma} \frac{1}{k+2} (c_{ij}^g \tau_{ij}^g)^2 \right) + (1 - p_{ij}^g) 0 \\ &= p_{ij}^g \left(\frac{L^j}{2\gamma} \frac{1}{k+2} (c_{ij}^g \tau_{ij}^g)^2 \right)\end{aligned}$$

Average export revenues across all firms in group g are the sum of the average export revenue for exporters times the proportion of exporters in that group (p_{ij}^g) plus the average export revenue for non-exporters (i.e. 0) times the proportion of non-exporters in the group ($1 - p_{ij}^g$).²⁰ We use the notation $\bar{\Pi}_{ij}^g$ to refer to the average proportion of sales accounted for by exports for firms of group g in country i .

Implications of discrimination

Differences in costs between the two groups have several observable implications. Proposition 1 considers the broad patterns which are likely to hold in the presence of certain discriminatory structures. In particular, while discrimination always reduces the number

¹⁹ This assumption is somewhat more restrictive than usual in circumstances where one group faces greater relative costs domestically than in foreign markets due to discrimination, as we argue. In the data that we will employ, however, it is in fact the case that not all firms export, among both men- and women-owned enterprises across all 128 separate countries. Exporters are in the minority in all but one country for men-owned enterprises and all but five countries for women-owned enterprises. Furthermore, it is the case that more than 88% of all exporters also serve their home market, among both men- and women-owned firms.

²⁰ γ is a model parameter governing the extent of product differentiation.

of firms in group 2, it may decrease or increase the rate of exporting and average export revenues for group 2, depending on the relative impact of home-market discrimination on costs in the home market versus foreign markets.

Proposition 1. *The number of extant firms, average export revenues, and the proportion of exporting firms differ between groups in the presence of discrimination. Average domestic revenues do not differ between groups even in the presence of discrimination.*

- 1a. If $A_i^2 \leq A_i^1$ absent discrimination, there are fewer group 2 firms for any positive level of discrimination: $\frac{N_{ii}^2}{N_{ii}^1} = \frac{A_i^2}{A_i^1} \left(\frac{\tau_{ii}^1}{\tau_{ii}^2} \right)^k < 1$.
- 1b. If $A_i^2 \leq A_i^1$ absent discrimination, there are fewer group 2 exporters for any positive level of discrimination: $\frac{N_{ij}^2}{N_{ij}^1} = \frac{A_i^2}{A_i^1} \left(\frac{\tau_{ij}^1}{\tau_{ij}^2} \right)^k < 1$.
2. Average domestic revenues are equal between the two groups: $\bar{R}_{ii}^1 = \bar{R}_{ii}^2$ for any $\frac{\tau_{ii}^2}{\tau_{ii}^1}$ or $\frac{\tau_{ij}^2}{\tau_{ij}^1}$.
- 3a. The proportion of group 2 firms which export is greater than of group 1 firms when the discrimination penalty faced by group 2 firms is greater in the domestic market: $p_{ij}^2 > p_{ij}^1 \iff \frac{\tau_{ii}^2}{\tau_{ii}^1} > \frac{\tau_{ij}^2}{\tau_{ij}^1}$.
- 3b. Average export revenues for group 2 firms are greater than for group 1 firms when the discrimination penalty faced by group 2 firms is greater in the domestic market: $\bar{R}_{ij}^2 > \bar{R}_{ij}^1 \iff \frac{\tau_{ii}^2}{\tau_{ii}^1} > \frac{\tau_{ij}^2}{\tau_{ij}^1}$.
- 3c. The proportion of sales which are exports for group 2 are greater when the discrimination penalty faced by group 2 firms is greater in the domestic market: $\bar{\Pi}_{ij}^2 > \bar{\Pi}_{ij}^1 \iff \frac{\tau_{ii}^2}{\tau_{ii}^1} > \frac{\tau_{ij}^2}{\tau_{ij}^1}$.

We refer to the condition described in parts 3a-c of this proposition as the *escape through export condition*.

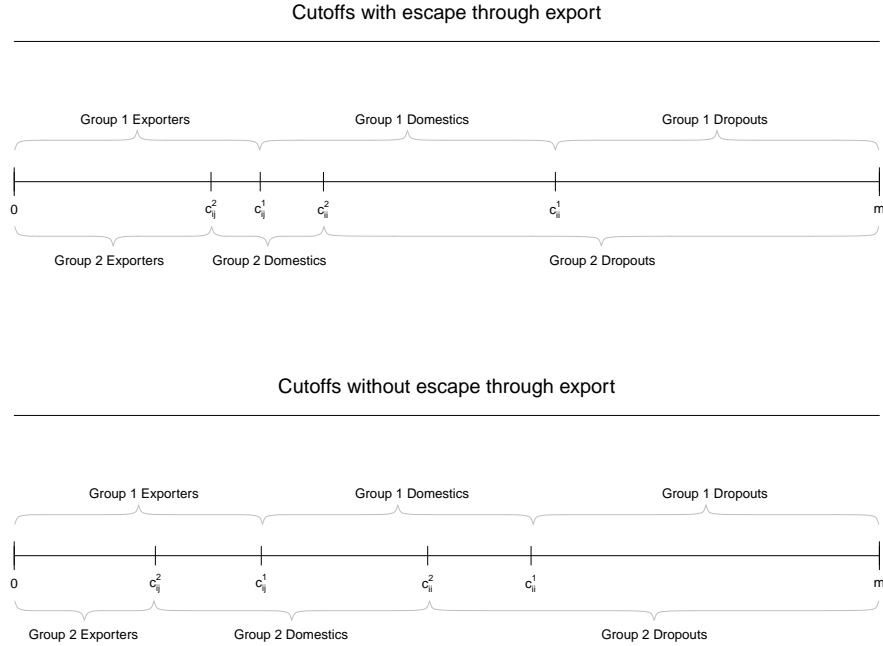
Condition 1. *The escape through export condition is defined as:*

$$\frac{\tau_{ij}^2}{\tau_{ij}^1} < \frac{\tau_{ii}^2}{\tau_{ii}^1}$$

This condition implies that accessing the export market provides a relative improvement in the level of discrimination faced by group 2 firms compared to group 1 firms. In other words, the disadvantages faced by those firms in the domestic market are at least partially ameliorated by gaining access to foreign markets. Of course, the opposite inequality may obtain, in which case we say that export sales are especially burdened by the impacts of discriminatory institutions. If the two expressions are equal, than all discrimination is pre-production or location-based by definition.

An illustration of the cutoffs in equilibrium under two cost scenarios, one where condition 1 holds and one where it does not, is presented in Figure 2. In the top half of the

Figure 2: Productivity Cutoffs under Two Scenarios



figure, group 2 firms face a 75% cost premium on all domestic sales, and a 25% cost premium on all export sales, relative to group 1 firms. (Note that export sales remain more costly than domestic sales for group 2 firms because of shipping costs and trade barriers.) This corresponds to an instance of escape through export. In the bottom half, group 2 firms pay only a 25% premium on domestic sales but a 75% premium on export sales relative to group 1 firms. Under this setting, export markets actually strengthen the effects of domestic discrimination. All other parameters are identical between the two scenarios.

Two comments are worth making about Proposition 1. First, exporting presents a new set of challenges for all firms due to costs of international trade. So this escape, as we have put it, is only available to some members of group 2 – those that are the most productive. Second, the condition $A_i^2 \leq A_i^1$ is not required for parts 2 and 3 of this proposition. Moreover, A_i^g does not enter into the escape through export condition at all because the impacts of discrimination on N_{ei}^2 and m_i^2 are inescapable features of being located in a particular country. Relaxing this assumption generates a generalized escape through export condition with very similar properties, which is discussed below.

Because our empirical analysis employs a continuous measure of discriminatory institutions, it is helpful to provide several additional comparative statics which relate the level

of discrimination with the extent of observed discrimination. These comparative statics help to put the theory's predictions into continuous form and provide several additional empirical tests. A continuous version of the escape-through-exporting condition ends up playing an important role in the derivations.

Condition 2. *The escape through export condition (continuous version) is that $\frac{\partial \tau_{ii}^2}{\partial \delta_i}$ be sufficiently large relative to $\frac{\partial \tau_{ij}^2}{\partial \delta_i}$.*

This condition requires that any increase in production costs created by domestic discrimination have larger effects on firms both located in *and* serving the domestic market, rather than those firms serving foreign markets. The escape through export dynamics described above (wherein discrimination creates a spurious relative improvement in exporting for group 2 firms) are not observed as discrimination increases if the burden of that extra discrimination falls hardest on export sales.

Proposition 2. *A number of comparative statics relate the extent of domestic discrimination in i (which increases both τ_{ii}^2 and τ_{ij}^2 , as well as τ_{ji}^2) to observable outcomes:*

- 1a. *The ratio of all group 2 to group 1 firms is decreasing in domestic discrimination (δ_i).*
- 1b. *The ratio of exporting group 2 to group 1 firms is decreasing in domestic discrimination.*
2. *Average domestic revenues, $\bar{R}_{ii}^2 = \bar{R}_{ii}^1$, are increasing in domestic discrimination.*
- 3a. *The proportion of group 2 firms which export increases faster in domestic discrimination than for group 1 firms, $\frac{\partial p_{ij}^2}{\partial \delta_i} > \frac{\partial p_{ij}^1}{\partial \delta_i}$, under condition 2.*
- 3b. *Average export revenues: \bar{R}_{ij}^1 is decreasing and \bar{R}_{ij}^2 may be decreasing or increasing in δ_i . Moreover, $\frac{\partial \bar{R}_{ij}^2}{\partial \delta_i} > \frac{\partial \bar{R}_{ij}^1}{\partial \delta_i}$ under condition 2.*

Part 1a says that the ratio of women- to men-owned firms, of any sort, should decrease continuously with discrimination. Part 1b says the same for the ratio of exporting firms. Domestic revenues, as noted in part 2, should increase with more discrimination because there are fewer total firms, so each firm can capture more market share. Finally, as discriminatory institutions increase, the selection effect on women-owned firms increases, meaning that a greater proportion of them will export, relative to men-owned businesses and that the change in their average revenue is greater than for men-owned businesses as long as the escape through export condition holds.

Our model relies on a particular set of assumptions about how discrimination affects the number, productivity and costs of firms. How robust are our main propositions to alternative model set-ups? Appendix 1 shows that we can easily relax the assumption that discrimination affects the number and productivity of both exporting and non-exporting firms equivalently and generate a very similar set of results to those above. This implies that the escape through export notion can be treated more expansively than we have above.

Export opportunities, under the right conditions, might also mean a reduced burden on the number and productivity of firms facing discrimination, rather than just their variable costs of production. The substance of our test for whether escape through export can occur is identical under this generalized framework.

Relatedly, we believe that a very similar logic might hold in a model employing fixed, rather than variable, costs of production. While variable costs are a good way to treat some aspects of discrimination – higher labor costs or lower margins on sales – other aspects of discrimination may look more like fixed payments. Because the Melitz and Ottaviano (2008) model does not admit fixed costs, we explored an extension of Abel-Koch (2010) which easily accommodates fixed costs of both production and exporting which vary across groups due to discrimination. Using numerical simulation only, we found initial support for the idea that escape through export is possible when the impacts of discrimination fall most heavily on fixed production costs, but is impossible when the impacts of discrimination tend mostly to raise fixed costs of exporting. We leave the formal development of this conjecture for future research.

Empirical strategy and data

Empirical models

The comparative statics described in propositions 1 and 2 suggest a set of testable implications which can establish whether the escape through export condition holds. To translate the model to our particular case and data, we take the following two steps. First, our model is developed in a two-country setting. Here, we treat the world market as a unified whole.²¹ Second, to ease interpretation we translate some of our nomenclature from the formal section to this specific case. Henceforth, we refer to groups 1 and 2 with the suffixes M and W to represent men and women, respectively. All variables that are domestic or general (such as N^W , the number of women firms serving the home market in country i) have no subscript, while all variables which refer to exporting have a subscript X . The number of men-owned firms exporting is written N_X^M and the proportion of women-owned firms which export is written p_X^W , for example.

Each of the empirical implications described in Propositions 1 and 2 are mapped into a country- and firm-level estimating equation, with the exception of the first propositions which concern the total number of firms. For these propositions, there is no firm-level equation. The complete set of estimating equations are provided in Table 1.

The models vary in the extent to which they build off of the functional forms implied by the theory. The country-level tests of Proposition 1 are the most tightly mapped into the

²¹ This is obviously a simplification but we think a credible one because of the outsize importance of the OECD countries, which share similar institutions, as destinations for developing-country exports.

Table 1: Summary of Empirical Models and Predictions

#	Outcome	Country-level equation	Predictions	Firm-level equation	Predictions
1a	Number of total firms (N^e)	$\ln N^W - \ln N^M = \beta_0 + \beta_1 \delta_i$	$\beta_0 \leq 0, \beta_1 < 0$	-	-
1b	Number of exporting firms (N_X^e)	$\ln N_X^W - \ln N_X^M = \beta_0 + \beta_1 \delta_i$	$\beta_0 \leq 0, \beta_1 < 0$	-	-
2	Average domestic revenues (\bar{R}^e)	$\overline{\ln R}^W - \overline{\ln R}^M = \beta_0 + \beta_1 \delta_i$	$\beta_0 = 0, \beta_1 = 0$	$\ln R_i = \beta_0 + \beta_1 \delta_i + \beta_2 g_i + \beta_3 \delta_i g_i + \mu_i + \mu_h + \alpha \mathbf{x}_i + \epsilon_i$	$\beta_1 > 0, \beta_2 = 0, \beta_3 = 0$
3a	Proportion of firms which export: (p_X^e)	$p_X^W - p_X^M = \beta_0 + \beta_1 \delta_i$	$\beta_0 \leq 0, \beta_1 > 0$	$e_i = \beta_0 + \beta_1 \delta_i + \beta_2 g_i + \beta_3 \delta_i g_i + \mu_i + \mu_h + \alpha \mathbf{x}_i + \epsilon_i$	$\beta_1 < 0, \beta_2 \leq 0, \beta_3 > 0$
3b	Average export revenues (\bar{R}_X^e)	$\overline{\ln R}_X^W - \overline{\ln R}_X^M = \beta_0 + \beta_1 \delta_i$	$\beta_0 \leq 0, \beta_1 > 0$	$\ln R_{Xl} = \beta_0 + \beta_1 \delta_i + \beta_2 g_k + \beta_3 \delta_i g_k + \mu_i + \mu_h + \alpha \mathbf{x}_i + \epsilon_i$	$\beta_1 < 0, \beta_2 \leq 0, \beta_3 > 0$
3c	Proportion of revenue from exporting: (Π_X^e)	$\bar{\Pi}_X^W - \bar{\Pi}_X^M = \beta_0 + \beta_1 \delta_i$	$\beta_0 \leq 0, \beta_1 > 0$	$\Pi_{Xl} = \beta_0 + \beta_1 \delta_i + \beta_2 g_i + \beta_3 \delta_i g_i + \mu_i + \mu_h + \alpha \mathbf{x}_i + \epsilon_i$	$\beta_1 < 0, \beta_2 \leq 0, \beta_3 > 0$

Notes: δ_i denotes the measure of discriminatory institutions, g_i denotes the gender of the firm owner (1 is used for women, 0 for men), \mathbf{x}_i is a set of firm-level control variables, μ_i are country intercepts, and μ_h are industry intercepts.

theory, but we nonetheless make three concessions to facilitate the empirical tests. First, we assume a linear relationship between discrimination and the outcome of interest. Because our theoretical measure of discriminatory institutions, δ_i , has no direct empirical referent we are forced to conjecture about the functional form of this relationship. Second, all sales figures are logged *prior* to calculating averages across firms. Firm sales are highly skewed so averages of unlogged sales are unlikely to produce meaningful results. Note also that for propositions 3a-c, we generally employ differences in ratios rather than ratios of ratios. This improves the stability of estimators by avoiding outliers and permits the handling of observations with 0 exporting firms, which arise mainly in the subset analyses.

For the firm-level models, the first two caveats described above apply as well as one more. The impact of all country-, industry- and firm-level factors are assumed to operate linearly, whether measured or unmeasured. Note, at least, that this is no assumption for our dichotomous measure of ownership-gender but of course does make an assumption about the interaction of gender of ownership with our measure of discrimination. Finally, we condition on unobserved country- and sector-level factors using random intercepts. Rather than employ clustered standard errors at the country or industry level (which might also be appropriate), we opt to directly model the heterogeneity across countries and industries.²² Of course, our random intercepts do not address country-level confounders, so for this task we focus on the country-level models with additional covariates.

We employ OLS for all country-level models. All of the firm-level models use linear models with random intercepts at the country and industry levels, even where the outcome is dichotomous, as with the probability of exporting.

Main data sources and variables

The data on firm characteristics comes from the World Bank Enterprise Survey (World Bank, 2013a). The comprehensive cross-country data set made public by the World Bank, and employed in this paper, covers a set of surveys with coordinated questions for the years 2006-2014. Surveys from 128 mainly developing countries are included in the data, including China, India, Indonesia, Brazil, Pakistan, Nigeria, and Russia. The data sources and cleaning are described more fully in the Online Appendix. The survey covers both manufacturing and services industries, and this paper employs data on both groups for the main results, because there is significant export activity even within the services firms interviewed. We do however recreate all models among manufacturing firms only in the Online Appendix and find very consistent results compared with the entire sample.

The data is at the firm-level, and respondents answer a large battery of questions about the characteristics and performance of their firm. Respondents report their total sales and the percentage of sales which are accounted for by national sales and exports. These re-

²² A fixed effects specification is unavailable because our primary measure of discrimination does not vary within countries.

sponses are used to determine whether a firm exports or not, total home-market sales and total export sales. Firm respondents also report whether there is a women owner of the firm and the gender of the top manager of the firm. The primary measure of gender of ownership used throughout is the response to the former question. We refer to this variable as *Woman-owner*, and discuss some potential issues with it below.

Our measure of discrimination against women is the Social Institutions and Gender Index developed by Branisa, Klasen and Ziegler (2009) and available from OECD (2013). The SIGI index codes 12 aspects of discrimination, including ownership rights, civil liberties, personal integrity, and family role. The coding of this variable coincides with the beginning of the collection of the enterprise data. Further, the SIGI index captures durable social and legal institutions which are unlikely to have changed significantly over the eight year span of our firm-level data; thus, we expect that the export activity of firms has had little effect on this measure of discrimination. We employ the overall SIGI index which weights all dimensions equally, which we refer to as *Discrimination*. We believe that all of the dimensions of the index, whether physical integrity, property or legal rights, or familial obligations, are potentially relevant for impacting the ability of women-owned enterprises to succeed. The separate dimensions are highly correlated, in any event, and thus would produce similar results.²³ The SIGI index is increasing in discrimination, so a country with an index of zero has the least discriminatory institutions while a country at 1 has among the most discriminatory institutions globally.

Alternative explanations and additional controls

The results presented below support the escape through export hypothesis by showing a positive correlation between discrimination and the relative rate of relative of exporting for WOE's in comparison with MOEs. In this section we address some threats to this inference by discussing alternative explanations for the observed outcome; properties of the escape through export test and our main estimator which limit potential confounders to a particular class of alternative explanations; and a regression-based strategy for potential confounders.

One major alternative explanation for any finding supportive of escape through export concerns our measure of WOE's. The World Bank Enterprise Survey only reports if *an* owner

²³ The 5 different categories of the SIGI dimensions are all positively correlated. Excluding son preference, which is less correlated with the other subindices, all of the other categories have correlations over .2; three-quarters of the potential correlations are over .4; and one-quarter are over .8. And unsurprisingly, all of the subindices are correlated with the holistic index which we prefer at .5 or above. The SIGI index is also highly correlated with other measures of gender institutions, including the OECD's Gender Development Index and various outcomes like female literacy, education, income and political representation. We renormalized the index to fall on a scale from zero to one where 1 is the second most discriminatory country. The most discriminatory country is Afghanistan at 1.70 and we generally avoid making inferences when the SIGI index exceeds one. Our main findings are robust to the exclusion of Afghanistan from the data.

is a woman. This raises the issue of firms with multiple owners, which are likely to be larger and more export-capable, and so might explain our findings. To address this concern, we check the robustness of our main results across several subsamples, including singly-owned firms and firms with women top managers. We also employ regression adjustments for firm size and ownership characteristics in our firm-level robustness checks.

A second alternative explanation is that firms can be placed in a woman's name to hide the identity of a male owner. One could imagine a case where a woman (a wife or daughter, for example) is a proxy for a male politician who is prohibited from owning a firm due to some electoral law or corporate regulation. In this case, the firm may be less affected by discrimination as long as everyone who interacts with the firm knows that it is a front for the male politician. Moreover, such a firm might have preferential access to credit or to other goods which make it more successful and more export-capable. Thus, in our results, we would be capturing the ability of firms owned by politicians or corrupt businessmen to export, rather than capturing selection effects facing WOE's.

We use two strategies to address this potential threat to our analysis. First, our main tests of the escape through export condition rely on a difference-in-ratios: the difference between WOE's and MOE's of the relative rate of exporters versus non-exporters. For the alternative explanation above to be valid, exporters among WOE's would have to benefit from these connections at a significantly higher rate than exporters among MOE's. We consider this unlikely, because where there are examples of firms placed in a woman's name to hide connections, there are probably even more firms that are put in a man's name (such as a brother or son). Moreover, for this alternative explanation to drive our results, the transfer of ownership rights to female relatives would have to be more likely in countries with the most discriminatory institutions. We also consider empirical methods to discount this possibility. We show that our results hold when considering the gender of the top manager, rather than the owner; management positions are less likely to be given to women relatives to conceal ownership of the firm. We condition on country-level covariates (proxies for government capacity and corruption) and firm-level covariates (presence in a capital city) which are likely to be correlated with this particular form of corruption.

The fact that our main test uses a difference-in-ratios provides a more general form of robustness to our claims by restricting the number of alternative explanations to a particular class of confounders. Suppose that discriminatory institutions are associated with other country-level features that tend to suppress exports for both men- and women-owned firms. The absolute numbers of exporters for both groups is naturally lower, but it is easy to show within our model that the relative numbers of the two groups remain unchanged. For a confounding variable to be driving our findings below it must therefore satisfy two conditions. First, it must be correlated with gender discrimination. Second, it must affect the export or domestic performance (but not both) of groups differentially by gender. So, for example, the idea that political corruption leads to more large, exporting apparent WOE's

is a potential alternative explanation; the idea that gender discrimination is associated with less trade openness (for all firms) is not. Our statistical inferences on the association between discrimination and relative rates of exporting are similarly robust to the latter type of endogeneity, owing to the construction of the outcome as a difference in ratios.

Our final strategy for addressing alternative explanations that might affect, for example, the export performance of WOE firms and the extent of discrimination, is to introduce a large number of controls into our country-level models. These controls are factors that are likely correlated with either discriminatory institutions or the extent of trade. And while it seems more plausible that some of these variables meet the criteria for potential confounders described above than others, we show below that our main results are entirely robust to the inclusion of all of these potential confounders. This provides reassurance that some alternative driver of institutions or firm performance is not generating our findings.

These country-level controls include measures of development and industrial structure from the World Bank *Development Indicators*: GDP per capita (ln GDP pc); GDP growth in the year the survey was administered (GDP growth); exports as a percentage of GDP (Exp/GDP); imports as a percentage of GDP (Imp/GDP); and services and manufacturing as a percentage of GDP (Serv/GDP; Mnft/GDP). We include measures of barriers to exporting: number of documents needed to export (Docs to exp); the average time needed to export (Time to exp); and the World Bank's Ease of Doing Business index (Ease of bus) (World Bank, 2013b). Two geographic determinants of exposure to trade are collected from the Country Geography Data from the Economics Department of Portland State University. These are a measure of average distance to coast or other navigable waterway (Waterways) and percentage land area within 100 miles of coastline (Prox to water). Finally, we consider five additional institutional features which may be correlated with gender discrimination: the polity score as a measure of democratic institutions (Polity score, from the Polity Project at the Center for Systemic Peace); the World Bank (2013b) indices of property rights and financial rights; a common proxy for the level of contract enforcement, the natural logarithm of the average number of days for contract enforcement; and, the Corruption Perceptions Index from Transparency International (2010).

A variety of additional firm-level characteristics are also measured in the data, including: firm sector; whether the firm is a subsidiary or independent; whether the firm is a headquarters with or without sales; ownership structure; firm size; percent domestic- and foreign-owned; the year of founding; and, whether the firm is located in a capital city (or region). These are used as additional controls in firm-level robustness checks.

Finally, the data contain missing observations at both the firm- and country-level. We use five imputed datasets generated with software from Honaker, King and Blackwell (2011). Estimates from the imputed datasets are recombined using the formulae in Rubin (2004), in the case of the firm-level models, or with software published by Imai, King and Lau (2009) and described more fully in Imai, King and Lau (2008). We replicate our main findings

without imputation using listwise deletion of observations with missing data in the Online Appendix. We find that our main results are very similar, suggesting that our findings are not unduly driven by the specification of the imputation model.

Results

This section presents our main empirical findings. We first present results which demonstrate that all of our main predictions, under the escape through export assumption, are confirmed. A portion of the extra costs imposed on women-owned businesses can therefore be avoided by accessing export markets, particularly for WOE's located in developing countries with the highest rates of discrimination. We go on to describe the enormous toll that these institutions take on the numbers of women-owned enterprises, whether they export or not. We conclude this section with a description of a number of robustness checks of our main results.

Assessing the model overall

Before examining the model results in detail, we consider the overall performance of the model by examining the number of correctly and significantly signed model coefficients. We also discuss briefly the explanatory power of the main explanatory variable, Discrimination. Of the country-level tests, all 12 coefficients are consistent with the hypotheses articulated in Table 1, and all coefficients expected to be non-zero are significant at the $\alpha = .001$ level. These results are presented in Table 2. Note that 7 of these tests are relatively undemanding (for example, that the intercept be ≤ 0) but that the most important tests of the model all have strict predictions. Discriminatory institutions also explain a meaningful quantity of the variation in relative performance between men- and women-owned enterprises, especially on the extensive margin (in models 1a, 1b and 3a) where these effects are expected to be most visible and least obscured by noise.

We discuss the substantive size of these effects further in the next section but note the large toll that discrimination takes. The least discriminatory countries have scores of zero on the SIGI index and the most discriminatory countries have scores around one, on our index of discrimination. Moving from the least to the most discriminatory countries therefore reduces the ratio of women to men-owned firms by about 78%. For exporters only, the same effect is smaller, consistent with the escape through export hypothesis, but still substantively significant at around 61%. Interpreting column 3a, which is our main test of the escape through export hypothesis, we find that this same change in discrimination increases the difference in export ratios by about .085 or nearly 9 full percentage points – a substantively large effect given that less than 20% of firms export in our data.

Our theoretical model also fits the firm-level data well: 12 of the 12 firm-level tests are consistent with our predictions. These tests are contained in Table 3. As in the country-level

Table 2: Country-level Tests of the Model

	1a	1b	2	3a	3b	3c
Outcome	Number of Firms $N^W - N^M$	Number of Exporters $N_X^W - N_X^M$	Domestic Revenues $\bar{R}^W - \bar{R}^M$	Proportion Exporters $p_X^W - p_X^M$	Export Revenue $\bar{R}_X^W - \bar{R}_X^M$	Pr. Revenue from Export $\Pi_X^W - \Pi_X^M$
Int.	-0.267 (0.088)	-0.287 (0.094)	-0.083 (0.074)	-0.005 (0.010)	-0.160 (0.142)	-0.006 (0.006)
Discrimination	-1.544 (0.212)	-0.947 (0.228)	0.121 (0.181)	0.085 (0.024)	1.231 (0.350)	0.056 (0.016)
N	128	128	128	128	128	128
Adj. R ²	0.30	0.12	0.00	0.16	0.10	0.11
F-test	53.33	17.59	0.54	23.51	14.02	15.01

Notes: All models OLS. *** $p < 0.001$, ** $p < 0.01$, * $p < 0.05$, + $p < 0.10$ from a two-tailed test with null hypothesis $\beta_j = 0$. Number of firms and exporters are logged; revenues are logged before averaging.

models, four of these tests are not strict but the remaining eight are all statistically significant at the $\alpha = .001$ level or greater.²⁴ This sparse set of explanatory variables also explains a significant proportion of the variance in the outcome variables, even for the relatively noisy outcomes, such as firm revenues and the proportion of sales from exporting.²⁵ Overall, we conclude that these relatively spare empirical models are entirely consistent with the formal model as laid out above and that the factors we highlight explain a meaningful amount of variation within the data.

Escape through export?

The results described above provide initial support for the contention that exporting provides some partial amelioration of costs imposed by discriminatory institutions in the home market. All six of the tests of the escape-through-export hypothesis, whether at the country- or firm-level, are signed correctly, and all are significant at the 1% level or greater. These results substantiate the second escape-through-export condition, which holds that increases in discriminatory institutions have cumulatively negative consequences that are greater for women-owned firms' domestic sales than export sales.

However, we must still determine under what conditions escape through export is actually possible, and to what effect. Recall, that the possibility of leaving behind some costs of discrimination via exporting is only likely to hold in more discriminatory countries –

²⁴ Note that sign of the lower-order term for Discrimination is negative, and that the impact of Discrimination for women-owned firms on exporting is close to zero on net, for the reasons described above. Discriminatory institutions are more likely in countries with other anti-competitive and anti-growth institutions. As described above, our tests of the escape through export condition are robust to these forms of confounding.

²⁵ In particular, note that the likelihood ratio tests for the firm-level models use the complete random effects specification, only omitting the non-random covariates, for the null model.

Table 3: Firm-level Tests of the Model

	2	3a	3b	3c
Outcome	Domestic Revenues R_l	Export Status e_l	Export Revenue R_{xl}	Pr. Revenue from Export Π_{xl}
Int.	12.642 (0.275)	0.310 (0.025)	4.077 (0.332)	10.463 (1.198)
Woman-owned	-1.871 (0.498)	-0.182 (0.031)	-2.537 (0.433)	-6.687 (1.398)
Discrimination	-0.033 (0.035)	-0.026 (0.004)	-0.451 (0.052)	-2.243 (0.193)
Disc. · Woman-owned	-0.006 (0.081)	0.157 (0.010)	2.284 (0.131)	7.932 (0.491)
N	102424	102424	102424	102424
(Cond.) R^2	0.27	0.13	0.13	0.10
LRT test	7.56	317.71	379.75	280.09

Notes: Linear models with industry and country random effects. *** $p < 0.001$, ** $p < 0.01$, * $p < 0.05$, + $p < 0.10$ from a two-tailed test with null hypothesis $\beta_j = 0$. The DVs in models 2 and 3b are logged.

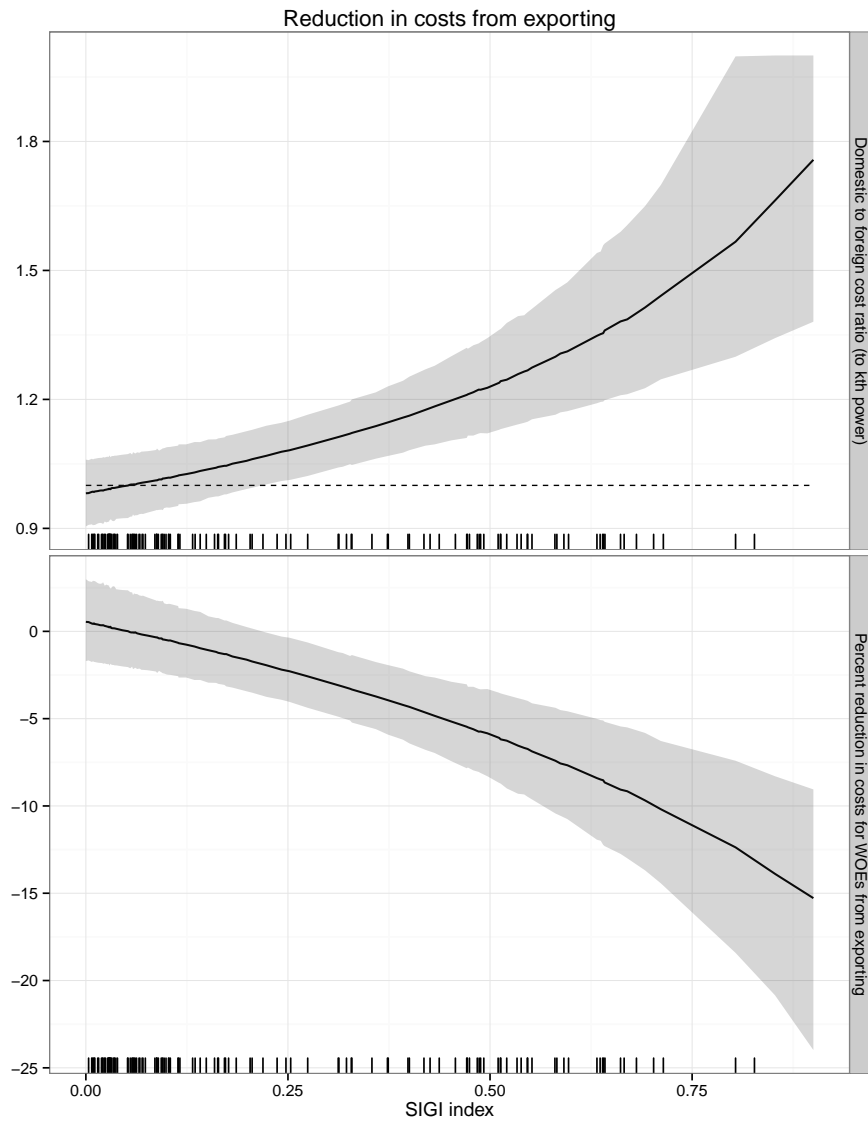
those whose discrimination is significantly above the prevailing level of discrimination on the world market. WOE in these countries are those which, in theory, are able to gain some partial relief from any negative impacts of discrimination that are market-specific. In contrast, WOE in countries that have lower levels of discrimination than that prevailing in the world as a whole are likely to see no relief and may find exporting particularly difficult relative to domestic sales. We therefore seek to determine where this dividing line occurs.

We have assumed here that firms across countries face a common set of global institutions which affect their costs as they attempt to access a common world export market. These costs may still differ between women- and men-owned firms, of course, but they do not differ across countries. Under this assumption, it is possible to use the result from Proposition 1, and the country-level results in models 3a, to estimate under what circumstances the first escape-through-export condition is met.²⁶ While the ratio of underlying costs is dependent on the parameter k , our inferences about where the escape-through-export condition do not depend on k because the critical threshold occurs where the underlying cost ratio is equal to one.

The top half of Figure 3 suggests that this condition is met for 76% of the countries in our data. (The 95% confidence interval for the escape-through-export ratio only excludes

²⁶Using Proposition 1 for this purpose requires converting our differenced outcome variable into a ratio. Recall that the outcome variable in Model 3a in Table 2 is $p_x^W - p_x^M$ but our proposition is phrased in terms of the ratios of these quantities. In order to estimate this ratio at various levels of discriminatory institutions, δ_i , while properly accounting for all uncertainty, we estimate a separate regression equation of p_x^M on δ_i . We then divide the expected outcome of the differenced dependent variable $(\widehat{p_x^W - p_x^M})$ by the \hat{p}_x^M and add one.

Figure 3: Escape Through Export in the Most Discriminatory Countries



1 for 44% percent of countries in the data set). In other words, for the most discriminatory countries in our data, there is statistically significant evidence that women-owned firms, when exporting, are able to leave behind a portion of the costs created by the discriminatory institutions in their home countries. Further, this evidence shows that discrimination that shields MOEs from domestic competition harms their export potential as a greater share of uncompetitive MOEs survive to face world markets. In this way, discrimination is similar to other government policies that shield firms from competition, such as assistance for state-owned enterprises.

But how great a portion of discrimination-imposed costs can be avoided by exporting? A tentative answer to this question is available by examining the impact of increased discrimination on the relative numbers of firms. Model 1b in Table 2 suggests that increasing the Discrimination variable from its 1st to its 3rd quartile decreases the ratio of woman- to man-owned exporters by around 33.5%, with a 95% confidence interval of (16.1, 47.3). If export were to provide complete escape from costs imposed by domestic discrimination, we would expect no change in the difference as discrimination at home would not affect exporting because all women-owned enterprises would face the same level of discrimination on the world market. In other words, we would expect this effect to be around 0. The effect of discrimination on women exporters is noticeably smaller, but not enormously smaller, than the reduction in all women-owned enterprises which follows from a similar increase in discrimination, which is about 48.1%, with 95% confidence interval (36.3, 57.7). These estimates therefore indicate that the incidence of at least some forms of discrimination falls very heavily on export sales, even if total discrimination on exports is at a lower rate than for domestic sales.

A more precise answer requires making an assumption about the model parameter k , which is the scale parameter of the assumed Pareto distribution of firm productivities. In numerical simulations, Bernard, Redding and Schott (2007) employ a scale parameter of $k = 3.4$. A justification from *this* data for using a similar parameter is described in the Online Appendix. The results of this analysis are presented in the lower half of Figure 3, which plots estimates for

$$100 \cdot \left(\frac{\tau_X^W}{\tau_X^M} - \frac{\tau_D^W}{\tau_D^M} \right) \cdot \left(\frac{\tau_D^W}{\tau_D^M} \right)^{-1} .$$

This object represents the percentage reduction in the cost penalty faced by women-owned firms who operate in export markets compared to domestic markets. As such, even modest reductions in percentage terms can be meaningful economically. Estimates of this cost penalty reduction as a function of the extent of discrimination are presented in the bottom half of Figure 3.

Women-owned enterprises in the least discriminatory countries see no reduction in discrimination-generated costs when they turn to export markets. For WOE in countries with median Discrimination scores the reduction in discrimination-induced costs associ-

ated with accessing export markets is only around 1.2% – this reflects how close the median level of discrimination is to that prevailing on the world market as a whole. These reductions exceed 6.6% when the Discrimination variable reaches its 80th percentile and 13.8% when at its 95th percentile. This analysis shows that accessing export markets creates meaningful, but not enormous, reductions in costs generated by discrimination. Note that these reductions are only available to firms that are productive enough to export and that are located in countries with above average levels of discrimination. For non-exporters and for WOEes located in countries with less discrimination, export markets provide no relief.

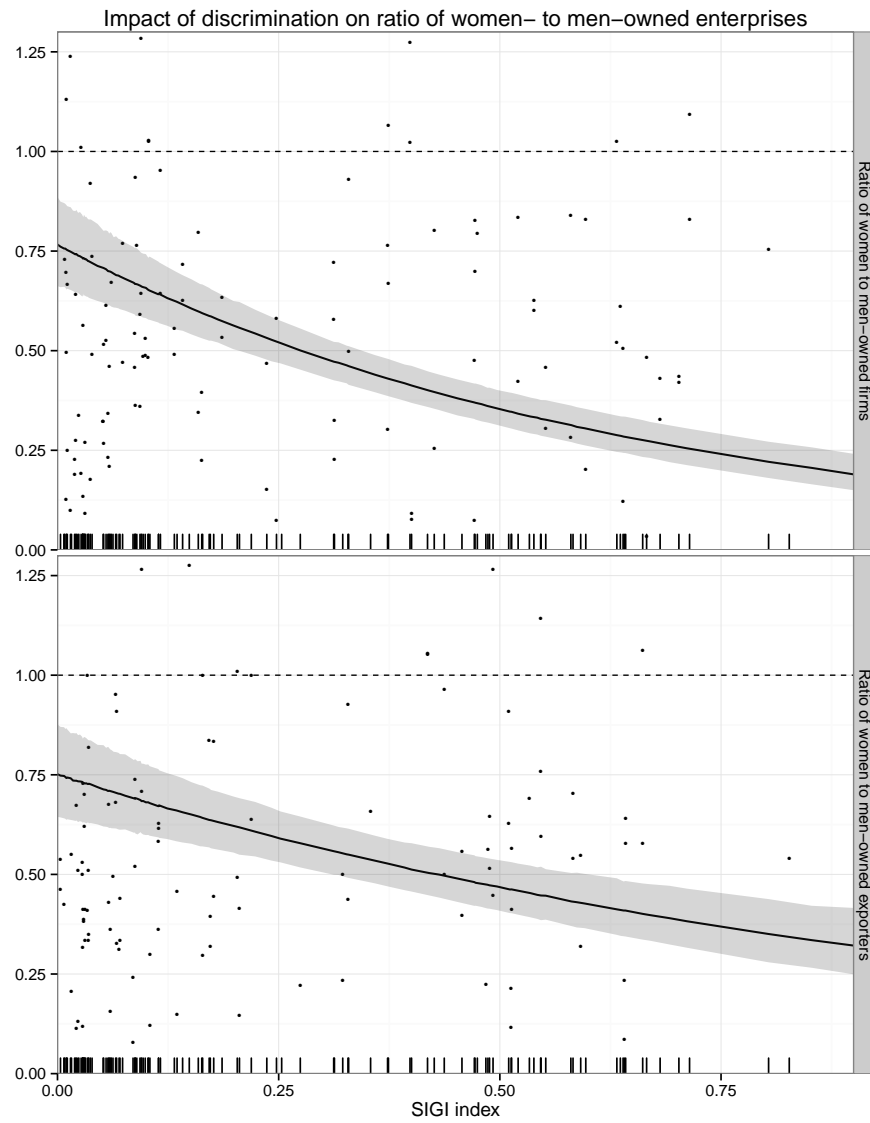
To sum up, the core finding of this paper is that the opportunity to export provides some escape from the deleterious effects of domestic discrimination for women-owned firms, but it is a partial and incomplete one for three reasons. First, the largest costs of discrimination are determined primarily by location, and so unavoidable through trade. Second, women-owned enterprises located in countries with institutions at or below average in terms of discrimination find that the ambient level of discrimination on global markets is as bad or worse than in the home market. Finally, only the most productive firms located in countries with relatively high levels of discrimination are able to benefit from exporting, due to the well-documented extra costs of exporting described in the literature on firm heterogeneity.

Quantifying the impacts of discrimination

In this section, we translate the estimated models into statements about the economic impacts of discriminatory institutions. We find that the impacts of discriminatory institutions on the number of women-owned enterprises are very large. To see this, consider first the ratio of women- to men-owned enterprises as a function of domestic discrimination. The estimated regression function (corresponding to model 1a in Table 2 above) is presented in the top half of Figure 4. In the least discriminatory countries, according to our measure of discrimination against women, the number of firms with a woman owner is around 76.1% of the number of firms with only men owners. At the median level of discrimination in our data this percentage falls to about 59.4% and at the 4th quintile of discrimination to around 33.2%.

The ratio of women- to men-owned exporters shows a similar pattern although the downward curve is less steep, reflecting the escape through export dynamic we describe above. The estimated regression function for this ratio is contained in the bottom half of Figure 2. In the least discriminatory countries, according to our measure of discrimination against women, the number of exporters with a women owner is around 74.8% of the number of firms with only men owners. At the median level of discrimination in our data this percentage falls to about 64.2% and at the 4th quintile of discrimination to around 45.0%.

Figure 4: Discrimination Reduces Relative Numbers of WOE



Robustness of the core results

We conduct several robustness checks for the baseline escape-though-export finding at the country and then firm levels. Our first set of robustness checks considers a broad range of country-level covariates associated with economic development, economic structure, trade exposure, and business environment which are added to the models estimated in Table 2. These results are presented in Table 4. These covariates control for potentially confounding relationships between discriminatory institutions and factors which influence the rate of exporting. It is worth noting, however, that these variables are very unlikely to affect our results because our primary tests use differences in ratios, as described above. Nonetheless, our core results are robust to any alternative explanations of this sort. All of our main country-level tests remain statistically significant and the sizes of the coefficients are similar to the baseline models with no control variables. Unsurprisingly, country-level variables that are not inherently associated with gender discrimination have generally weak and inconsistent effects on the differential performance of MOEs and WOE.

One question that is raised by the significant correlation between our measure of discriminatory institutions and differences in export performance of men- and women-owned enterprises is whether some other institutional features might also correlate with our outcomes of interest, thus explaining our findings. In placebo tests reported in the online appendix (Table B1), we replicate our main country-level test (model 3a in Table 2) successively substituting in polity score, the WB indices of property rights and financial rights, a proxy for contract enforcement, the World Bank Ease of Doing Business index, and the CPI Index as the main explanatory variable. None of these measures are significantly associated with the outcome variable, with the sole exception of the contract enforcement measure which has a substantively very small effect. We also note that the effect of the discriminatory institutions measure is robust to the inclusion of these alternative explanations. We therefore do not believe that these other institutions are explaining our results.

We also check the robustness of the firm-level results (these models are reported in Table 5) by incorporating a large array of firm-level covariates described above. One significant concern with the firm-level results is that larger firms have more owners, and so are more likely to have a woman owner and to export. These results therefore control for factors correlated with the number of owners and the size of the firm. Another potential concern is that firms in the capital have both a better ability to export, due to their proximity to the government, and a better environment for women entrepreneurs, as capital cities tend to be more cosmopolitan; controlling for the capital region should address this possibility. The core results hold controlling for these firm-level covariates, and are similar in size and statistical significance to the baseline results presented above.²⁷

²⁷ The one set of results which are different concern Model 2. The firm-level model including controls suggests that women-owned enterprises have lower domestic sales where our measure of discrimination is high. In other words, the richer firm-level model suggests that there is a noticeable negative

Table 4: Country-level Tests of the Model with Additional Covariates.

Outcome	Country-level models					
	1a	1b	2	3a	3b	3c
	Number of Firms $N^W - N^M$	Number of Exporters $N_X^W - N_X^M$	Domestic Revenues $\bar{R}^W - \bar{R}^M$	Proportion Exporters $p_X^W - p_X^M$	Export Revenue $\bar{R}_X^W - \bar{R}_X^M$	Pr. Revenue from Export $\Pi_X^W - \Pi_X^M$
Int.	1.458 (1.815)	0.951 (1.917)	0.406 (1.728)	-0.338 (0.214)	-4.502 (3.163)	-0.188 (0.141)
Discrimination	-1.809 (0.291)	-1.154 (0.306)	0.422 (0.263)	0.095 (0.034)	1.337 (0.484)	0.058 (0.022)
ln GDP pc	-0.205 (0.129)	-0.045 (0.136)	0.062 (0.119)	0.023 (0.015)	0.311 (0.215)	0.014 (0.009)
GDP growth	0.007 (0.018)	0.008 (0.019)	-0.004 (0.017)	0.002 (0.002)	0.032 (0.030)	0.001 (0.001)
Exp/GDP	0.833 (0.665)	0.226 (0.696)	0.104 (0.645)	-0.139 (0.077)	-2.139 (1.133)	-0.089 (0.048)
Imp/GDP	-0.808 (0.551)	-0.548 (0.574)	0.450 (0.543)	0.047 (0.066)	0.869 (0.994)	0.021 (0.041)
Docs to exp	-0.233 (0.376)	-0.222 (0.394)	0.153 (0.372)	-0.028 (0.044)	-0.460 (0.622)	-0.023 (0.028)
Time to exp	0.336 (0.190)	0.427 (0.198)	-0.132 (0.179)	0.017 (0.022)	0.098 (0.312)	0.014 (0.014)
Ease of bus	0.019 (0.453)	-0.067 (0.483)	-0.292 (0.403)	0.013 (0.054)	0.164 (0.759)	0.006 (0.033)
Serv/GDP	-0.689 (1.126)	-2.150 (1.189)	0.578 (1.054)	-0.047 (0.132)	-0.044 (1.892)	-0.027 (0.085)
Mnfr/GDP	-1.318 (0.981)	-2.027 (1.038)	-0.675 (0.924)	-0.001 (0.120)	0.241 (1.698)	0.002 (0.075)
Waterways	-0.208 (0.290)	-0.143 (0.308)	-0.138 (0.283)	-0.003 (0.034)	-0.140 (0.473)	-0.006 (0.021)
Prox to water	-0.178 (0.084)	-0.232 (0.088)	-0.019 (0.075)	-0.009 (0.010)	-0.085 (0.145)	-0.006 (0.006)
Polity score	0.000 (0.017)	-0.004 (0.018)	0.000 (0.015)	-0.003 (0.002)	-0.051 (0.031)	-0.002 (0.001)
Ind. of property rights	0.209 (0.153)	0.284 (0.161)	0.063 (0.139)	0.017 (0.018)	0.167 (0.252)	0.007 (0.011)
Ind. of financial rights	0.027 (0.036)	0.040 (0.038)	-0.072 (0.032)	0.006 (0.004)	0.089 (0.059)	0.005 (0.003)
Contract enforcement	-0.011 (0.160)	0.030 (0.168)	-0.061 (0.146)	0.031 (0.018)	0.439 (0.270)	0.018 (0.012)
CPI Index	0.079 (0.073)	0.032 (0.077)	-0.120 (0.064)	-0.005 (0.009)	-0.081 (0.128)	-0.003 (0.005)
N	128	128	128	128	128	128
Adj. R ²	0.45	0.34	0.15	0.28	0.23	0.25
F-test	5.34	3.35	1.16	2.49	1.94	2.12

Notes: All models OLS. *** $p < 0.001$, ** $p < 0.01$, * $p < 0.05$, + $p < 0.10$ from a two-tailed test with null hypothesis $\beta_j = 0$. Number of firms and exporters are logged; revenues are logged before averaging.

Table 5: Firm-level Tests of the Model with Additional Covariates

Outcome	Firm-Level Models			
	2	3a	3b	3c
	Domestic Revenues R_t	Export Status e_t	Export Revenue R_{Xt}	Pr. Revenue from Export Π_{Xt}
Int.	13.207 (0.294)	0.283 (0.026)	3.699 (0.337)	5.058 (1.345)
Discrimination	-1.079 (0.503)	-0.091 (0.029)	-1.211 (0.401)	-3.521 (1.347)
Woman-owned	-0.037 (0.034)	-0.014 (0.004)	-0.246 (0.049)	-1.326 (0.188)
Disc. · Woman-owned	-0.447 (0.076)	0.083 (0.009)	1.173 (0.122)	4.506 (0.476)
Est. Type: HQ with prod.	-0.295 (0.036)	0.007 (0.005)	0.046 (0.058)	0.412 (0.234)
Est. Type: Non-HQ, Alone	-0.146 (0.065)	-0.000 (0.007)	-0.002 (0.086)	0.552 (0.317)
Est Type: Non-HQ, Together	-0.237 (0.121)	0.008 (0.008)	0.055 (0.105)	0.349 (0.651)
Status: Private LLC	-0.408 (0.050)	0.005 (0.006)	-0.156 (0.076)	0.978 (0.311)
Status: Sole Proprietorship	-0.882 (0.057)	-0.067 (0.007)	-1.128 (0.086)	-2.011 (0.358)
Status: Partnership	-0.581 (0.058)	-0.043 (0.007)	-0.779 (0.089)	-0.937 (0.358)
Status: Other	-0.446 (0.095)	-0.004 (0.010)	-0.292 (0.132)	0.178 (0.532)
Size: Medium	1.221 (0.026)	0.085 (0.003)	1.179 (0.037)	2.777 (0.147)
Size: Large	2.079 (0.033)	0.263 (0.004)	4.209 (0.047)	12.003 (0.191)
Per private domestic owned	0.002 (0.001)	-0.000 (0.000)	0.001 (0.001)	0.002 (0.005)
Per private foreign owned	-0.003 (0.001)	0.002 (0.000)	0.029 (0.001)	0.120 (0.006)
Per largest owner	-0.001 (0.001)	-0.000 (0.000)	-0.004 (0.001)	-0.013 (0.003)
Year founded - 1950	-0.018 (0.001)	-0.001 (0.000)	-0.014 (0.001)	0.033 (0.004)
Capital region	0.211 (0.029)	0.010 (0.003)	0.058 (0.041)	-0.943 (0.164)
N	100284	100284	100284	100284
(Cond.) R ²	0.34	0.21	0.25	0.17
LRT test	21334.55	12824.70	28525.64	27870.27

Notes: Linear models with industry and country random effects. *** $p < 0.001$, ** $p < 0.01$, * $p < 0.05$, + $p < 0.10$ from a two-tailed test with null hypothesis $\beta_j = 0$. The DVs in models 2 and 3b are logged.

Table 6: Subsample Analysis of the Core Finding

Subset	Subset analysis for Model 3a					
	1	2	3	4	5	6
	All Firms	Top Managers	Majority-Owned	Singly-Owned	SMEs	Excluding Subsidiaries
<u>Country-level models</u>						
Int.	-0.005 (0.010)	-0.053 (0.010)	-0.012 (0.010)	-0.015 (0.022)	-0.004 (0.009)	0.003 (0.013)
Discrimination	0.085 (0.024)	0.080 (0.023)	0.083 (0.024)	0.083 (0.069)	0.067 (0.021)	0.077 (0.030)
N	128	128	128	123	128	128
Adj. R ²	0.09	0.09	0.08	0.01	0.07	0.05
F-test	13.25	13.88	12.12	2.59	10.40	7.61
<u>Firm-level models</u>						
Int.	0.310 (0.025)	0.316 (0.025)	0.296 (0.023)	0.267 (0.021)	0.248 (0.019)	0.287 (0.025)
Woman-owned	-0.182 (0.031)	-0.172 (0.031)	-0.182 (0.031)	-0.158 (0.033)	-0.151 (0.029)	-0.183 (0.032)
Discrimination	-0.026 (0.004)	-0.066 (0.005)	-0.026 (0.004)	-0.017 (0.006)	-0.016 (0.004)	-0.022 (0.004)
Disc. · Woman-owned	0.157 (0.010)	0.148 (0.012)	0.123 (0.012)	0.074 (0.016)	0.103 (0.010)	0.148 (0.011)
N	102424	102424	74080	43345	83116	85893
(Cond.) R ²	0.13	0.13	0.13	0.13	0.11	0.13
LRT test	317.71	243.32	118.87	20.76	126.44	249.40

Notes: All models OLS. *** $p < 0.001$, ** $p < 0.01$, * $p < 0.05$, + $p < 0.10$. Null hypothesis for intercepts are that $\beta_j = 1$ otherwise that $\beta_j = 0$.

Table 6 considers the core empirical finding about relative rates of exporting and discriminatory institutions among several subsets of the data. Country-level results are contained in the top half of the figure and firm-level results in the bottom half. The first column simply repeats the initial finding reported above for reference. Recall that the WBES survey asked if there was a women owner so it is possible that firms with multiple owners, which might tend to be larger in scale and so more likely to export, might be driving our findings. Of course, this would not explain why firms with a woman owner are not also larger in domestic sales, but we take the possibility seriously and therefore consider the same result in a number of subsets of the data.

The second column uses a question from the WBES on whether a women was the top manager of the firm being surveyed. This question is more precise than the ownership question because there is only one top manager. Note also that among the small and medium-size enterprises that make up the bulk of this data, women-managed enterprises are also

impact of discriminatory institutions on the intensive margin of women-owned enterprises, even if the country-level models (and the formal model) do not.

likely to be fully or majority owned by women.²⁸ The third column considers only firms that are majority-owned, in order to exclude firms with large numbers of owners. The fourth column, considers singly-owned firms, where the answer to the WBES question about gender and ownership identifies the genders of all owners by default. The fifth column considers small and medium size firms (those with less than 100 workers) and the sixth column excludes all firms that are subsidiaries of other firms.

For the country-level models, the size of the effect of discriminatory institutions is consistent across the subsets of the data. The main result is also significant in all of the subsets but singly-owned firms. The lack of statistical significance among this subset is not surprising in the country-level models because the number of observations gets cut substantially (and some countries have relatively few observations). This makes the resulting estimates noisier. The subset results should also help allay concerns about WOE as proxies for the true, powerfully-connected male owners. While men might put businesses in their wives' or daughters' names to hide their ownership, they are unlikely to hire a woman as a top manager simply to hide their connection. Instead, women are more likely to gain managerial status on their own merits but are likely to face many of the same aspects of discrimination as a women owner would.

Conclusion

This paper provides evidence that globalization can benefit business-owners facing discrimination by allowing them access to markets where the impacts of discrimination are less severe. Using a model of firm heterogeneity, we derive sharp empirical tests which distinguish whether globalization does indeed provide an escape from costs created by discriminatory legal and social institutions. The key test of this proposition is simply stated. If globalization provides relief from discrimination-induced costs in the form of markets with less discrimination, then we expect to find a higher proportion of women-owned firms exporting than men-owned firms in countries with the highest levels of discrimination. This is due to a selection effect: discriminatory institutions raise the costs of entry and the costs of doing business for those discriminated against, forcing the least productive women-owned enterprises out of business, while allowing some of the least productive men-owned enterprises to stay in business. If those businesses are able to avoid some of the costs created by domestic institutions on international markets, then a higher share of remaining WOE will be export competitive than among men-owned firms.

We test our model on country- and firm-level data comparing the performance of WOE to MOEs. We have two main findings. First, discriminatory institutions have a hugely negative impact on the number of women-owned firms relative to men-owned firms. While not

²⁸ Around 35.7% of surveyed firms with a women owner had a women top manager; around 77.9% with a women top manager had a women owner.

surprising, it is worth emphasizing the scale of the damage caused by these institutions for entrepreneurship among women. Second, our empirical tests confirm that WOE firms in states with high levels of discrimination can indeed escape some costs of discrimination by accessing export markets. We estimate that for the most discriminatory countries, the cost premium faced by women-owned firms is from 8 to 15% lower.

Globalization, then, provides women-owned firms in high discrimination countries with greater revenues than would have been possible without it. While we find that the static effects on firms' bottom lines are comparatively modest, the dynamic effects of trade liberalization on social institutions may be much larger. One avenue for future research is to test whether trade liberalization – for example joining the WTO or another PTA – differentially affects WOE firms and MOE firms. As trade liberalization weeds out the least productive firms, we would expect to see a greater number of MOE firms close after liberalization, as they have lower underlying productivity. We would also expect to see the relative profitability of WOE firms improve.

Another area for future research is to see how increasing the economic power of women entrepreneurs affects discriminatory institutions. It is possible that women-owned firms' export activities increase their political power and may lead to fewer discriminatory institutions over time. By redressing imbalances in income and entrepreneurial success, globalization may increase the political influence of women entrepreneurs, especially if larger firms or exporters are particularly influential members of the polity, as seems plausible. For many developing states, exporters are a key part of development strategy and provide much needed foreign currency; policymakers may be more willing to listen to these important entrepreneurs.

We highlight two additional contributions of this paper. First, there is nothing about our theoretical framework that is specific to discrimination against women. Although we do not test this implication, it is possible that accessing export markets might provide relief from ethnic, racial, religious or other types of discrimination. Second, our model and empirical results highlight the importance of integrating both firm heterogeneity and the selection effects unleashed by discrimination and globalization into the study of discriminatory institutions. These two factors give rise to counterintuitive empirical patterns that can only be rationalized in a theoretical framework that explicitly takes account of firms and selection effects.

In sum, this paper provides another justification for the wealthy democracies of the OECD to open their markets to developing nations. Because these states have relatively low levels of discrimination, they can provide much needed export markets for WOE firms from developing countries with high levels of discrimination. The OECD states might also consider increasing these positive effects by providing special access for these firms. This openness would allow women entrepreneurs greater access to an important market and potentially give them more resources to effect change at home.

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SUPPORTING INFORMATION

The following additional materials are available in the online appendices:

Appendix A: Model and Proofs.

Appendix B: Data and Empirical Methods.

Appendix C: Replication of Models without Imputation.

Appendix D: Replication of Models with Manufacturers Only.