Globalization, Gender Inequality, and Firm Innovation

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by Olga Lark

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Globalization, Gender Inequality, and Firm Innovation

Abstract

This thesis comprises four self-contained papers that rely on applied micro-econometric methods to understand which factors are important in shaping the gender wage gap in globalized firms and how firms innovate when exposed to trade-induced shocks.

In the first paper, we study how the within-firm gender wage gap in Sweden is affected by the degree of gender inequality in the home country of foreign investors. The results suggest that gender norms of the home country matter—the wage gap between men and women in foreign-owned subsidiaries appears to increase with the degree of gender inequality prevailing in the investors' home market.

The second paper aims to improve our understanding of how exports and the associated need for communication with foreign partners affect the gender wage gap. Our key finding is that exports of goods that are intensive in interpersonal contacts widen the gender wage gap. The negative wage effect is robust across various specifications and is most pronounced for domestic exporting firms, which mainly deal with external contractors. We ascribe this result to a male comparative advantage in bargaining—a skill that is especially needed and rewarded when serving foreign markets, where contracting problems manifest themselves.

In the third paper, we examine whether exposure to gender inequality at export destinations (in the form of customer discrimination) impacts the gender wage gap in exporting firms. Relying on high-quality matched employer–employee data from Sweden, we demonstrate that exports to gender-unequal destinations increase the within-firm gender wage gap. We find the most pronounced negative wage impacts for female managers, who appear to be particularly exposed to the gender inequality of export partners.

In the fourth paper, I explore how exposure to import competition across different geographical aggregations alters the innovation activity of firms in the manufacturing sector. Using detailed geographical information on the location of manufacturing producers in Sweden, I analyze whether increased competitive pressure from abroad triggers a different response in innovation at the national, local labor market, and municipality levels. By exploiting exogenous shocks in the foreign export supply of intermediate manufacturing goods, I find the most pronounced effects at the lowest levels of geographical aggregation, which are consistently negative across different innovation metrics.

Key words

Foreign ownership, Internationalization, Export, Contract intensity, Interpersonal contacts, Gender inequality, Gender wage gap, Gender norms, Gender inequality index, Customer discrimination, Import Competition, Innovation, Patents, R&D, Manufacturing

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MADE IN SWEDEN

To Nina,
my grandma

Contents

Abstract

This thesis comprises four self-contained papers that employ applied micro-econometric methods to explore the key factors influencing the gender wage gap in globalized firms and firms' innovation decisions in response to trade-induced shocks.

In the first paper, we study foreign ownership as a vehicle for transferring gender norms across international borders. Using detailed matched employer–employee data from Sweden, we analyze how the within-firm gender wage gap is affected by the degree of gender inequality in the home country of foreign investors. The results suggest that gender norms of the home country matter—the wage gap between men and women in foreign-owned subsidiaries tends to increase with the degree of gender inequality prevailing in the investors' home market. We identify the effect from within-job-spell variation in wages and show the robustness of our findings to alternative definitions of gender inequality and various sample cuts. The event study results further corroborate our findings.

The second paper aims to improve our understanding of how exports—another aspect of globalization—and the associated need for communication with foreign partners shape the gender wage gap. Relying on data similar to paper one, we examine how the demand for interpersonal skills in trade and gender-specific differences in negotiations are related to the remuneration of men and women. Our key finding is that exports of goods that are intensive in interpersonal contacts widen the gender wage gap. The negative wage effect is robust across various specifications and is most pronounced for domestic exporting firms, which mainly negotiate with external contractors. We ascribe this result to a male comparative advantage in bargaining—a skill that is especially needed and rewarded when serving foreign markets, where contracting problems manifest themselves.

In the third paper, we continue to study the effect of exports on gender-specific remuneration and examine whether exposure to gender inequality at export destinations affects the gender wage gap in exporting firms. We motivate the analysis through a stylized model where wages depend on worker productivity, and men have a comparative advantage when trading with gender-unequal countries due to customer discrimination. Empirically, we use high-quality matched employer–employee data from Sweden and calculate the exposure of firms to gender inequality through their export destinations. Although increased export intensity leads to a wider within-firm gender wage gap on average, the effect is entirely driven by trade with gender-unequal countries: We find no impact on the gender wage gap when firms increase their exports to countries with gender-equality levels close to that of Sweden. Female managers, who are most likely to interact with foreign customers, experience the most pronounced adverse wage effects.

In the last paper, I explore how exposure to import competition across different geographical aggregations affects the innovation activity of firms in the Swedish manufacturing sector. Specifically, I utilize detailed geographical information on the location of manufacturing producers in Sweden and analyze whether increased competitive pressure from abroad triggers a different response in their innovation at the national, regional, local labor market, and municipality levels. By exploiting exogenous shocks in the foreign export supply of intermediate manufacturing goods, I find the most pronounced effects at the lowest levels of geographical aggregation, which are consistently negative across different innovation metrics.

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'Start where you are. Use what you have. Do what you can.'
– Arthur Ashe

The book you hold in your hands[1] encompasses more than a thesis. This thesis marks a special chapter of my life, one in which I involuntarily transitioned into adulthood. Many great people followed me in this journey and I would like to thank them for helping me along the way.

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[1] or the PDF you gaze at

The papers in this thesis also benefited from constructive feedback from three external reviewers: Jonas Vlachos, Patrik Karpaty, and Olof Ejermo. I am grateful for your help and comments. Huge thanks also to Bengt, Maria, Petra, Gunes, Kaveh, Therese, Andreas E, Marta, Roel, Mohammad, Marta, Talina, Hossein, Pol, Simon, and others at the department for the helpful suggestions and feedback.

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[2] And no, I will not list all the names cos I will certainly forget and make someone pissed.

more characters in the acknowledgments compared to Linn, there you go. Thanks for sharing free time with us these last years: up in Åre or down in Ystad, laughing to tears, or discussing geopolitics. We've had a super fun time together and we miss you badly in Lund.

The quote summarizes precisely how I feel about this thesis, and the reference to Arthur Ashe is not accidental. While running regressions and writing papers, I've reinvented my old passion and started playing tennis. And it was tennis that bailed me out when it was the worst, so I am immensely grateful to my teammates, my coaches, and my club for the emotions and challenges on the court, where I have learned a few new things about myself.

Finally, I'd like to thank my family for their support. You taught me how to get things done despite the circumstances, and I think I've succeeded in that. I'm dedicating this thesis to my grandma, the most hard-working and resilient person I know. I admire how you withstand all the troubles and misfortunes while keeping an optimistic and hopeful view of life. I wish I had taken it after you.

I guess I am supposed to explicitly thank my nearest family too. Thank you, my most incredible, fun, and ridiculous creatures. Your idiotic jokes make every day of my life, which, by the way, fully belongs to you...
I've found us a new roller coaster, so fasten your seatbelts!

Lund, March 2024
Olga L

Introduction

Introduction

The central theme of this thesis is *globalization*, a process of growing interconnectedness and interdependence among countries, economies, cultures, and societies around the world. Through the analyses in four research papers, this thesis seeks to explore the multifaceted impacts of globalization on firms and individuals therein. Specifically, it delves into two main areas: i) the effects of globalization on gender inequality in the labor market in papers 1–3, and ii) the impact of globalization on firm innovation in paper 4. In these investigations, I together with coauthors shed light on how firms' engagement with international markets shapes their decision-making processes and the labor market outcomes of their employees.

A shared theme unifying the four papers is the methodology employed, which centers around applied microeconometric models. Drawing from the recent advancements in Labor Economics (Mittag, 2019; Woodcock, 2008, 2015), the first three papers rely on regression models featuring high-dimensional fixed effects. These models are tailored to tackle selection issues inherent to firms and individuals, ensuring robust analysis and reliable findings. To identify a causal effect in the last paper, I employ instrumental variable methodology using a shift–share instrument in the style of Hummels *et al.* (2014). The instrument is expected to represent an exogenous source of variation in import competition that Swedish firms are exposed to through shocks in foreign export supply of intermediates. Combined with numerous specification tests, the methods used in this thesis provide reliable and robust results.

Finally, the use of rich, high-quality data from Sweden is another common thread throughout the four papers. Sweden serves as an attractive case study for analyzing the effects of globalization for several reasons. Firstly, as a small open economy highly reliant on exports and imports, Sweden is particularly vulnerable to the effects of globalization on its economic activities. Additionally, Sweden ranks as the second most innovative country in the world, contributing significantly to the global innovation landscape (Dutta, Soumitra and Lanvin, Bruno and Wunsch-Vincent, Sacha, 2020). Finally, Sweden is recognized for its high level of gender equality, which creates opportunities for foreign actors to bring in changes in this dimension. These unique characteristics of Sweden and its comprehensive data on both individuals and firms enable a meaningful and fruitful investigation of research questions related to globalization.

The reminder of this introduction provides a summary of each paper in the thesis and outlines its contributions.

Summary and Contribution

Paper I: Foreign Ownership and Transferring of Gender Norms

The first paper in the thesis adds to the literature by studying how the transmission of gender norms across international borders influences the gender wage gap in the host country of foreign direct investment.[3] There is a growing interest in understanding the relationship between firm internalization and income inequality. While the wage premium for workers in multinational enterprises (MNEs) compared to domestic enterprises is well-documented, evidence on the distributional effects of internalization across genders remains inconclusive.[4] Specifically, recent literature suggests that firms' global engagement has disproportionately impacted female workers, with some studies indicating negative effects and others showing positive wage effects for women in foreign-owned firms (Kodama *et al.*, 2018; Magda & Sałach, 2020; Tang & Zhang, 2021; Vahter

[3] Foreign Direct Investment (FDI) is a type of cross-border investment in which an investor residing in one economy establishes a lasting connection to a company located in another economy.

[4] On the wage premium at multinational enterprises see, e.g., Aitken *et al.* (1996), Conyon *et al.* (2002), Doms & Jensen (1998), Driffield & Girma (2003), Griffith (1999), Görg *et al.* (2007), Haddad & Harrison (1993), Lipsey (1994), and Lipsey & Sjöholm (2004). For recent evidence on the effect of MNEs on wages and its spillovers on local firms see Setzler & Tintelnot (2021).

& Masso, 2019). In this paper, we delve deeper to explore and elucidate the role of investor culture in the wage-setting process of subsidiaries.

To the extent that foreign-owned firms accommodate the corporate culture and gender norms of their parent companies, we may observe either a widening or narrowing effect on the gender wage gap, depending on the investor's gender norms.[5] The hypothesis tested in this paper is whether the level of gender inequality in the FDI home country influences the magnitude and direction of the wage effect exerted by foreign ownership on host-country firms. Specifically, we hypothesize that foreign subsidiaries owned by investors from countries with high (low) gender equality will exhibit a relatively larger (smaller) gender wage gap.

We take this prediction to the data and investigate whether the wage differential is contingent on the ownership status and the level of gender inequality in the parent company's home country. To this end, we estimate a wage regression employing a high-dimensional fixed effects model using a matched employer–employee dataset for Sweden from 2005 to 2015. To capture the impact of gender norms on wages, our model incorporates a time-varying measure of gender inequality in the parent company's home country. To identify the main effect of interest, we rely on individual job spells and firm–year fixed effects. By doing so, we utilize within-firm variation in wages and compare otherwise similar workers in otherwise similar firms, while also accounting for individual and firm-level selection effects.

Our main findings reveal that while foreign ownership generally has a slight positive impact, leading to a narrowing of the wage gap on average, this effect varies significantly depending on the country of ownership. This finding strongly supports the notion that foreign investors disseminate their corporate culture and gender norms across borders, likely facilitated by expatriate personnel and standardized policies. Specifically, we observe that firms receiving FDI inflows from countries with high levels of gender inequality tend to exhibit a relatively larger gender wage differential. Importantly, this result remains robust across different measures of gender

[5] Notably, Bloom *et al.* (2012) document that multinational enterprises transfer their management practices and other aspects of their organizational structure abroad, presumably through expatriate staff.

culture and withstands various specification tests.

When studying the effect of home country gender norms across the wage distribution, we find that the adverse impact on female relative wages is particularly pronounced at the higher end of the distribution. This finding aligns with previous research on the glass ceiling effect documented in Sweden (Albrecht *et al.*, 2003, 2015). To the best of our knowledge, our study represents the first attempt to uncover the impact of investors' diverse gender norms on wages in their foreign subsidiaries.

Paper II: Bargaining for Trade: When Exporting Becomes Detrimental to Female Wages

The second paper aims to improve our understanding of how exports—another aspect of firm globalization—and the associated need for communication with foreign partners shape the gender wage gap. Despite joint efforts by countries to make trade more inclusive, it may, under certain circumstances, exacerbate female labor market opportunities, as highlighted in a report by the World Trade Organization (The World Bank, 2020). Although designed as gender-neutral, trade policies tend to have disparate effects on men and women, resulting in outcomes that diverge from the intended policies. This evidence underscores the need for closer examination of the relationship between exports and firm-level gender inequality, which is the main focus of this paper.

The emerging literature on the topic has highlighted two personal attributes considered crucial for exports, which may explain the asymmetric remuneration of men and women in globalized firms. The first attribute is flexibility in working hours, essential for operating across various time zones. If women are less time-flexible or perceived as such, they may face a relative wage penalty in exporting firms (Bøler *et al.*, 2018).[6] Another

[6] In a sample of college-educated workers, Bøler *et al.* (2018) find that a 10 percentage point increase in the firm export share leads to a 13 percentage points larger gender wage gap. Moreover, a higher number of export markets and export varieties is associated with the gender wage gap going up by 5 and 8 percentage points, respectively. The authors argue that the magnitude of the estimated effects is non-negligible compared to other potential drivers of the gender wage gap, such as labor market experience and psychological attributes.

attribute pertains to gender differences in interpersonal skills, which are arguably important for communication with foreign partners. Given that women are often found to excel in such skills, exporters could potentially create better opportunities for them, particularly in white-collar occupations (Bonfiglioli & De Pace, 2021).[7] Earlier research has also documented the male comparative advantage in negotiations—a valuable social skill when navigating diverse cultures and social norms inherent to foreign partners worldwide [8] [9]

Hence, the kind of gender-specific skills that are most needed and rewarded by exporters remains an empirical question. We add to the literature by documenting how the type of exported goods shapes firms' demand for particular skills and thereby drives a disproportionate wage impact across genders. Engaging with foreign contractors across the globe requires a certain degree of bargaining and relationship building. If intensified exports increase firms' demand for bargaining skills, this could counteract the positive effect of the female comparative advantage in interpersonal skills and result in a wage penalty for women.

In the empirical analysis, we utilize matched employer–employee data from Sweden spanning the period 1997 to 2015. To identify the effect of exports and the need for communication on female relative wages, we employ a wage regression incorporating fixed effects for each employer–employee and each firm–year observation. This approach enables us to leverage within-firm variation in both wages and export patterns while addressing the selection at the worker, firm, and match levels. We

[7] According to Bonfiglioli & De Pace (2021), a 10 percent higher export sales decrease the gender wage gap by 0.05 percent for white-collar worker, with no significant effects observed for the blue-collar workers. For literature on the female comparative advantage in interpersonal skills in the non-trade contexts, see Black & Spitz-Oener (2010); Borghans *et al.* (2014); Cortes *et al.* (2021); Ngai & Petrongolo (2017); Spitz-Oener (2006), among others.

[8] See e.g. Hederos Eriksson & Sandberg (2012); Kray & Thompson (2004); Stuhlmacher & Walters (1999); Walters *et al.* (1998) on the evidence of male comparative advantage in barganing.

[9] Roethlisberger *et al.* (2023) provide an extensive review of the literature documenting the contribution of individual attributes (and social norms) to the gender pay gap. The estimated contribution of personal attributes is almost always significant and tends to hover from a few percent in some studies to large and significant contributions in others.

find that when goods export intensifies, the gender wage gap widens, particularly in industries characterized by high contract intensity, where buyer-seller interaction is essential for trade transactions. This result emphasizes the role of male comparative advantage in bargaining when serving foreign markets, and the importance of bargaining skills for the remuneration of workers. To underscore the link between exports and the demand for negotiation skills, we demonstrate that the observed negative effect primarily affects white-collar workers, particularly managers and sales personnel. Based on these findings and additional analysis, we conclude that conducting business with diverse partners worldwide alters the skill requirements of exporting firms.[10]

An additional contribution of our study is to separate the effect of foreign ownership from the effect of exporting, which are two distinct yet interconnected aspects of firm globalization. As suggested by the first paper in this thesis and previous research (Kodama *et al.*, 2018; Tang & Zhang, 2021), MNEs can transfer their corporate culture across borders, thereby influencing gender-specific labor market outcomes in subsidiaries located in host countries. Our results are robust to a series of specification tests, including tests of the aforementioned flexibility hypothesis. Lastly, we complement our findings with a rent-sharing analysis, revealing that men's proficiency in negotiation gets remunerated when there are rents to compete for, a common scenario in industries characterized by high levels of contractual intensity. Taken together, our findings underscore a significant and previously unrecognized relationship between firms' demand for interpersonal and bargaining skills, the nature of their exported goods, and the within-firm gender inequality.

[10] In support, we present evidence from an occupational structure analysis revealing that exports of contract-intensive goods lead to a restructuring of employment composition within firms. Specifically, a larger proportion of the labor force becomes involved in selling and bargaining activities as a result of this shift. For occupational task-content literature, see Autor *et al.* (2003), Acemoglu & Autor (2011), and Costinot & Vogel (2010), among others.

Paper III: Do Exporters Import Gender Inequality?

The objective of the third paper is to further investigate the connection between exports and gender inequality, aiming to uncover additional potentially significant channels. We contribute to the literature by identifying a novel mechanism that elucidates the gender wage gap in firms with a global reach. We demonstrate that the impact of increased exports on the within-firm gender wage gap depends on gender norms prevalent in the destination countries. These findings echo those in the first paper, highlighting the intertwined and intricate nature of the impact globalization has on gender-specific labor market outcomes.

Our study is motivated by the premise that firms' engagement in international trade increases the number of direct interactions between domestic workers and foreign buyers.[11] To the extent that some trade partners have an explicit preference to engage with male counterparts, *customer discrimination* (Becker, 1957) on behalf of such partners might limit women's opportunities to generate revenues for their firms. This idea is formalized in a stylized model and then empirically tested using matched employer–employee data from Sweden over 1997–2015. Relying on a similar methodology as before and using fixed effects for each employer–employee match and for each firm–year observation, we exploit within-firm variation in wages and export patterns and hold selection on the worker, firm, and match level constant.

Our main finding is that exports to gender-unequal destinations increase the within-firm gender wage gap. The results further reveal that the average adverse effect is entirely driven by firms exporting to gender-unequal countries. Increased exports to other countries with gender equality, comparable to Sweden, exhibit no impact on the gender wage gap. The estimated effects are not only statistically significant but also economically meaningful. Added to that, we find the most pronounced negative wage impacts for female managers, who tend to be particularly exposed to the gender inequality of export partners.[12] The main result appears

[11]The importance of business travels and in-person meetings for trade has been evidenced in the literature Battiston *et al.* (2020); Bernard *et al.* (2019); Söderlund (2020); Startz (2021).

[12]This finding speaks to the emerging literature on the glass ceiling effects and

utterly stable across various specifications. Finally, after accounting for several mechanisms discussed in the previous literature, we show that the effect of destination gender inequality on female relative wages stays intact. Our paper provides evidence of international trade generating negative externalities across countries by transferring gender inequality and affecting workers in the most gender-equal countries. This paper elicits the idea that, in an increasingly globalized world, a universal shift in attitudes toward higher gender equality is crucial to achieving the full potential of gender parity in society and the labor market.

Paper IV: Import Competition and Firm Innovation: A Spatial Approach Using Swedish Manufacturing Data

The final single-authored chapter of the thesis delves into a distinct topic: firm innovation. Considerable attention has been devoted to understanding the effects of import competition on domestic innovation in the literature.[13] Yet the focus has almost exclusively been on the economy-wide measures of import competition, neglecting its spatial dimension. In this paper, I pursue a more granular approach to assess competitive pressure and assign the local economy a central role in shaping the trade-induced changes in firm innovation. Instead of utilizing a nationwide metric of import competition, commonly employed in the literature, I adopt a micro-geographical approach where I identify areas that are sufficiently small to capture relevant variation in competitive pressure. Specifically, I examine how Swedish manufacturing producers adjust their innovation activity in response to an import shock across different geographical demarcations: at the macro (country), meso (local labor market), and micro (municipality) levels.

In the empirical analysis, I zoom into a narrowly defined type of import competition in the output markets and its impact on within-firm innovation. I analyze the innovative behavior of Swedish producers of intermediate manufacturing goods that (presumably) do business with firms in the vicinity. By considering imports of the same intermediate

gender gaps in promotions triggered by internalization (Araujo *et al.*, 2022; Jäkel, 2022).

[13] See Shu & Steinwender (2019) for a synthesis of the recent literature.

manufacturing goods by Swedish importers, I identify changes in the competitive pressure exerted on the producers in their (local) output market. By doing so, I identify import competition that is most relevant to producers' economic activity and their decision-making. To this end, I utilize detailed geographical information on the location of single-plant manufacturing firms in Sweden. Specifically, I analyze whether increased exposure to foreign competition at the national, local labor market and municipality levels triggers a different response in firms' innovative behavior. I focus on within-firm changes in innovation, by considering both input (R&D spending, investments in ICT) and output (patents from PATSTAT) measures of innovation. To address potential endogeneity concerns, I exploit exogenous shocks in the foreign export supply of intermediate goods and construct the shift–share instruments in the style of Hummels *et al.* (2014), with a built-in spatial dimension.

I find that 10 percent increase in exposure to foreign competition prompts manufacturing firms to reduce the number of filed patents by an average of 4.9 percent. Additionally, my findings indicate that both municipalities and local labor markets are pertinent geographical units for assessing the impact of import competition. When relying on the economy-wide measure of import penetration, I can no longer detect any significant impact on firm innovation. Thus, my results reveal a distinct geographical patterm: The impact of import exposure that I identify diminishes gradually with distance as I employ more aggregated measures of import exposure. The established effects stem from the within-firm variation in innovation activity and remain robust to a series of specification tests. The results also remain qualitatively similar when alternative measures of firm innovation are utilized. Hence, this paper contributes meaningfully to the literature with a robust finding that locality matters in identifying the level of import competition induced on firms and their innovation efforts.

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