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Will Market Competition Trump Gender Discrimination? Lessons from India

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Empowering women to engage in productive employment is critical not just for economic growth and poverty reduction, but also for achieving gender equality. Developing countries around the world are adopting pro-competitive policies in the hope of promoting growth. Such policy reform packages originate in different economic spheres ranging from fiscal reforms, trade and regulatory reforms, infrastructure investments, urban land-use policies, reforms to eliminate labor market rigidities, and so on. The competition induced from such policies can generate economic growth through higher productivity, reduced factor misallocation, and rising female labor force participation. Our understanding of how structural reform policies impact gender segmentation is still at an early stage. India provides a good data point for examining these issues. India is simultaneously a leader in promoting women's participation in government but also a laggard in gender issues in the workplace. In spite of competition-inducing reforms, investment in infrastructure, trade liberalization and domestic reforms that India undertook since the turn of the century, gender based segmentation has not subsided over the years. This work dissects many features of structural reform, and examines how they impact female participation in growth. It helps to understand which regulatory reforms are particularly effective in reducing gender segmentation, so that other regions within India, or nations outside of India, can learn how to make their efforts count the most. Developing countries have an opportunity to not only improve the allocative efficiency of factors but also create an environment of equal opportunity and growth.

Introduction

It is widely established that women earn less and have lower access to economic opportunities. For instance, women are more likely than men to engage in lower productivity activities, work as unpaid family members, work in the informal sector, and move in and out of the workforce. Since the 1990s, female labor force participation has stagnated globally at around 55%. Most employed women are half as likely to be working full-time, relative to employed men. And when women

participate in workforce, they earn 10-30% less than men (World Bank, 2011, 2014, 2016). These gaps are starker in developing countries like India or those in the Middle East but nonetheless are also present in the most advanced nations such as Sweden.

Gender discrimination, in terms of deprivation of economic opportunities, and access to education or even basic health services, has continued in India, amidst the recent modernization of its economy. For example, the World Economic Forum's (WEF) Gender gap report (2015) ranks India at 108th position out of a sample of 145 countries. Although political quotas for women in India have significantly improved their participation in political affairs, nonetheless, these developments are not matched in economic and business spheres where India ranks among the lowest 15 countries in the WEF's indices on economic participation and opportunity, educational attainment and health and survival.¹

Female participation in the labor force in India, although rising, is only 29%, as compared to 83% for men. This figure is very low compared to its peers and neighbors such as the Philippines (53%), Nepal (83%) and advanced countries (e.g., UK, 70%). India desperately needs to unlock this workforce to reach not only sustainable development goals on gender equality, human development, and poverty eradication but also to foster economic growth and shared prosperity.

Structural Transformation from a Gender Lens

Gender plays an important role in structural transformation and growth. It is widely perceived that pro-competition reforms should trump gender discrimination. Competitive forces are likely to turn employment outcome in favor of females because firms that incur an efficiency loss from discriminating against women will be competed away from the market unless they change their hiring strategy. Since women offer cheap and flexible labor in many settings vis-à-vis men, greater competition induces feminization of the workforce.

Enterprise data, from more than 900 districts in India, shows interesting twists and turns in economic participation of women.

- Enterprise ownership--Share of female-owned plants in both unorganized manufacturing and services sector has increased, although the share of female-owned plants in the unorganized manufacturing sector is much larger than in the services sector. However, the output share of female-owned plants has remained low, and hovers around 8% and 6% in unorganized manufacturing and services, respectively.

¹ India ranks among the top 10 countries in the WEF's political empowerment index, which is one of the pillars of the Gender gap index. See World Bank Working Paper for more detail. Will Market Competition Trump Gender Discrimination in India? [World Bank Policy Research Working Paper No. 7814](#)

- Jobs--The gender composition of employees has changed marginally. The share of females in manufacturing employment has increased only marginally, while that in services has increased substantially. More female workers are finding services to be a better or more available employment avenue than manufacturing.
- Gender Segmentation--There is a clear pattern of gender segmentation in both manufacturing and services. In the unorganized manufacturing sector, an average of 90% of employees in female-owned business are females, while this share is 81% in the case of services. Despite many competitive reforms that India has undertaken, this pattern of gender based segmentation has in fact become more accentuated over the years. For instance, the share of female employees in female-led informal manufacturing plants increased from 88% in 2001 to 93% in 2010. In the case of services, the share of female employees in women-led establishments increased from 75% to 87% during the same period. Likewise, the share of male employees in male-owned businesses has increased from 80% to 86% in unorganized manufacturing.
- Gender participation by industry-- An examination of the pattern in economic participation and gender segmentation by industry shows that tobacco products, wearing apparel and textiles attract the largest count and share of women entrepreneurs, perhaps because globally these industries are known to impose lower requirements on physical labor. Among services, it is the education, sewage, refuse disposal, sanitation and financial intermediation services that attract the largest share of female proprietors. These are broadly also the industries that attract the largest count and shares of female employees.
- Gender aspect of technology--The proportion of plants using the Internet in the services sector is associated with larger female employment share and lower segmentation in both the male-led and the female-led establishments. Comparably, we find null effects of Internet usage among plants on female based activity or segmentation in unorganized manufacturing. Technology plays a vital role in reducing gender segmentation in the services industry relative to that in informal manufacturing
- Gender aspect of demographic dividend--A higher female-to-male ratio in population is highly correlated with heightened activity among females, including higher segmentation in female-led plants and lower segmentation in male-led plants. A larger demographic dividend, measured as the ratio of working age population relative to non-working age population, is also associated with increased activity and lower segmentation, especially in male-led plants. In the case of services sector, however, a higher working age population is significantly correlated with higher segmentation in female-led plants. The participation of women in both manufacturing and services is greatly influenced by larger working age populations and female-to-male gender ratios in the local economy.
- Gender ranking of states--Andhra Pradesh, Tamil Nadu and West Bengal are among the states that have the highest number and shares of female-owned plants in both manufacturing and services. The states with the lowest shares of female-owned plants are in Bihar and Assam. It is surprising that the nation's capital, Delhi, has the lowest share of

female-owned establishments in manufacturing. Its position in services sector is only slightly above the national average.

- Entrepreneurship--States that have the highest count and shares of female entrepreneurs are also the states with highest count of females in workforce, be it in manufacturing or services. This pattern could be associated with the economic, social and policy traits of the state. For example, two out of the top four states with the highest count of women employed in manufacturing are from South India (Tamil Nadu and Andhra Pradesh). In the case of services, it is again the states from South India that account for large employment count in female participation in economic activity.

Has the gender gap across different states in India converged over time? The states with higher income have displayed higher growth in shares of female-led plants. Indeed, the gap in female-led plants has widened between the leading and lagging states. The states with higher employment of women or those with the highest shares of female-led plants are also among the most segmented when it comes to employing workers of the same gender.

Are women entrepreneurs concentrated in low-paying industries? Empirical evidence suggests that there is a strong negative relationship between average industry wages and the share of industry in female-led plants in the unorganized sector. The concentration of female entrepreneurs in low-wage industries has grown over time. Women entrepreneurs in the unorganized manufacturing sector are more dominant in industries that pay lower average wages and the growth in women entrepreneurs is higher in such industries. By comparison, this association between the share of female-owned plants and average industry wages in the services sector is only mildly negative. But the differences between female entrepreneurs in high wage industries and those in low wage industries is narrowing in India.

Industries that show higher rates of female entrepreneurship and employment are also broadly the industries that show the highest segmentation in terms of female employees being matched to female owners. If people prefer to work with their own “types” then in the case of India, gender of the owner overwhelmingly predicts the gender of the employees. This is also true for male-led plants, where, for instance, radio, television, and communication equipment, other transport equipment and fabricated metal products are among the most segmented in informal manufacturing, while in the case of services, male-led plants in water transport, land transport and research and development tend to employ the largest share of male workers. Although segmentation by gender is increasing in most industries, it is remarkably heightened in female-led plants in the basic metals and motor vehicles, trailers and semi-trailers segments of informal manufacturing, while within services it has increased the most in postal and telecommunications and real estate services.

How has the spatial layout of the gender dimension of economic activity evolved in India? The share of female owned businesses has declined with the distance from the Big-7 cities. In terms of female employment share, this has declined with distance from the Big-7 cities in the services

sector, while we do not observe any definitive spatial location pattern in the case of unorganized manufacturing. On the other hand, distance to Big-3 cities has not influenced the share of female activity, whether measured in terms of ownership share or employment share. Although gender segmentation is higher for female-owned plants than male-owned plants in the unorganized manufacturing sector and vice-versa for the services sector, we do not observe any decisive spatial pattern either with respect to the distance of districts from big-7 or big-3 cities.

Has gender segmentation across establishment sizes worsened over time? Yes, gender segmentation has increased. Irrespective of whether segmentation is based on female-owned or male-owned establishments, it is larger for small plants. Segmentation is larger for an average male employee vis-à-vis an average female employee across all size bands. Said differently, on average, a male employee is more likely to be working with a male co-worker than a female employee is to be working with a female co-worker. This measure of segmentation is also at its peak in smaller plants, however, for female employees it declines with increase in plant size up to mid-sized plants. Segmentation among male employees in manufacturing does not change much across the various size bands. In services, we observe a marginal but smooth decline across size bands in the services sector.

Our state and industry level descriptive statistics suggest that the states and industries with higher female entrepreneurship shares are also the ones with higher female participation shares in employment. Further, there is a positive association between female involvement in ownership or in employment and gender segmentation in female-led businesses. In general, the magnitude of this correlation is found to be stronger in unorganized manufacturing than in the services sector. These trends in structural transformation suggest that there is a clear pattern of gender segmentation in both manufacturing and services. However, these broad patterns mask the varying trends at the enterprise level.

Impact of Competition

If gender disparity is a result of discriminatory hiring practices in the labor market, then economists, dating back to Gary Becker, would argue that competition should drive out such discrimination. The idea behind this theory is that people prefer to work with their own “types.” In lax environments, or when firms have market power, managers may engage in discriminatory behavior to hire their own “type” and still be able to remain in business.

However, competition is thought to put a brake on the scope of discrimination and crony capitalism. If a firm is in a fierce battle for survival, then it must optimize to stay in business, and firms with managers who are willing to give up (or never had) tendencies to discriminate over employees will be more likely to succeed. Evidence from the United States suggests that following deregulations in the banking sector, discrimination within banks and among product markets declined due to greater competition. However, a systematic study on the impact of pro-competitive reforms on gender discrimination and/or segmentation in developing countries is rather scarce.

Our work is related to two different strands of literature, one that links the impact of pro-competitive changes in the economy to discrimination in hiring decisions and another that specifically deals with gender-based differences in economic outcomes. The first strand of literature specifically relates to the economics of discrimination, dating back to Becker (1957). This area of research has noted the challenges of separating out taste-based discrimination from statistical discrimination from unobservable factors. Although our work contributes to this literature, it differs from it in an important way. Much of the discrimination discussion focuses on how to measure and interpret individual level wage differentials absent any reform or cross-group comparisons. The focus of our work is centered on **workplace segmentation by gender of employees and owners** and how competitive changes can induce changes in discrimination patterns.

We examined gender-based segmentation at the enterprise level. While some of the imbalances observed are undoubtedly due to discrimination, we use the term “segmentation” because perfect gender balance is not efficient either. Gender-based comparative advantage in certain occupations and group-based specialization imply that workforces will never be perfectly balanced at the plant or industry level. India's enormous imbalances, however, suggest that it is far from the efficient level.

There are two important contributions of this work to the literature on gender and growth.

- One, the limited research that does study the ‘gendered’ impact of competition and growth in developing countries mainly investigates the effect on female labor force participation (FLFP) rates, sectoral employment patterns and wage inequality. The focus of this work is to additionally highlight the impact of such reforms on gender segmentation. Specifically, India's work force is highly segmented by gender. For instance, an earlier study on India’s informal manufacturing reveals that 92% of employed women are in female-owned businesses while 97% of working men are employed in male-owned enterprises (Ghani, Kerr and O'Connell, 2014). Said differently, this work describes the extreme inclination of female-led establishments to hire female employees and likewise the tendency of male-owned plants to have a primarily male-dominated workforce. Furthermore, this work uses a novel index that measures segmentation based on the perspective of an average employee, to additionally offer insights on the role of pro-competitive forces in mitigating segmentation.
- Two, most studies on developing countries have employed trade liberalization as a competitive force to study the changes in gender discrimination thereafter. A few studies in the context of developed countries have also focused on domestic banking reforms. Using establishment level data from India, we study the impact on gender-based outcomes and segmentation in both manufacturing and services emanating from a range of pro-competitive reforms including not only India’s mostly exogenous trade liberalization

episode, but also industry-specific domestic reforms, urbanization, spatial development and infrastructural reforms.

India is a very important laboratory for studying these effects. First, India has a history of discrimination, broadly speaking, be it by gender, caste, or otherwise. Moreover, this matters for India's economic growth and development. For instance, it is estimated that that an improvement in public provisions (such as better water facilities, sanitation development, and access to electricity) which increases female labor participation by 1.5% would lead to a 1.4% gain in GDP. India's per capita income could be 10% to 13% higher than under the baseline scenario of unchanged gender inequality in 2020 if the gender gap decreases by 50% from its 2008 value. The widely followed crimes against women in India and the growth of female political set-asides speak to this important struggle of mainstreaming gender parity in India's growth narrative.

India has undergone massive competitive changes since the turn of the millennium. This has perhaps been a result of a conscious strategy of restructuring the economy through a wide variety of reforms, such as the massive trade liberalization episode of the 1990s, the large-scale investment in highway infrastructure in the 2000s, and more recently the domestic reforms that dismantled reservations of products for smaller plants.

These macro reforms are known to have enhanced economic activity and improved allocative efficiency and productivity at the firm level. As opposed to the theoretical predictions of competition in reducing taste-based discrimination, our aggregate level trends point to an increase in gender segmentation in Indian manufacturing and services sectors. It is feasible that some other factors, beyond competition, are leading this trend. To test the micro impact of increased competition on gender segmentation, we exploit the spatial and industry level variation in reforms where certain districts (e.g., in GQ upgrades) or specific industries (e.g., in tariff liberalization or de-reservations) were differentially affected.

Empirical Findings

We experiment with three different elements of pro-competitive reforms—large-scale infrastructure investments, trade liberalization and domestic policy reforms.

Infrastructure--Physical infrastructure, measured as the local district level composite comprising of measures on the quality of roads, telecom, electricity and safe drinking water, is associated with heightened shares of women-led enterprises, particularly in informal manufacturing. In both the sectors, physical infrastructure is also significantly and positively correlated with the female employment shares and a decline in segmentation among male-led establishments. It is, however, associated with increased segmentation among female-led plants. These results are broadly robust to including only young plants or only plants paying higher wages, or to excluding some of the explanatory variables such as the spatial fixed effects measured via the distance from the biggest cities.

Transport— The fact that local district level physical infrastructure is correlated with female activity and reduced segregation by gender in primarily male-led plants provides a basis for our next exercise regarding the spatial organization of female activity around the GQ highways. The internal infrastructure of India limits the scope of competition as it can be difficult to move products and services efficiently, and local barriers and corruption can prevent entry.

The GQ network, totaling a length of 5,846 km, connects the four major cities of Delhi, Mumbai, Chennai, and Kolkata. Beyond the four major cities that the GQ network connects, the highway touches many smaller cities like Dhanbad in Bihar, Chittaurgarh in Rajasthan, and Guntur in Andhra Pradesh. The GQ upgrades began in 2001, with a target completion date of 2004. In total, 23% of the work was completed by the end of 2002, 80% by the end of 2004, 95% by the end of 2006, and 98% by the end of 2010.²

Prior work finds evidence of improved inventory efficiency and input sourcing for manufacturing establishments located on the GQ network almost immediately after the upgrades commenced. Likewise, Ghani, Goswami and Kerr (2016a) demonstrate that the GQ highway project had an immediate and lasting impact on economic outcomes such as output, employment, establishment count and productivity for the formal sector of Indian manufacturing. Specifically, the GQ upgrades increased organized manufacturing output by 15%-19% over the 2000-2010 period. For reference, Indian manufacturing output doubled during this period, and 37% of this growth occurred in the non-nodal districts within 0-10 km of the GQ network. Nearly a fifth of the organized sector growth upgrades can be credited to better connectivity provided by the enhanced GQ network, with all of that impact concentrated in adjacent districts. Using these results that point to a heightened competition in districts located close to the GQ highway as a starting point of our study, we examine whether the GQ upgrades shifted the gender balances through the competition channel.

Were establishments located in districts that were in close proximity to the highway linked to a shift in the gender segmentation of their workforce? Empirical results suggest that as the distance of non-nodal districts from the GQ highways increases, female participation in informal manufacturing and services activity is mostly increasing, and segmentation among female-owned plants is sharply decreasing, especially so in the districts lying in the 10-50 km range. This is opposite to the expectations of Becker's theory on the impact of competitive forces on taste-based discrimination. The GQ had a significant and a longer term economic impact on the organized sector, and the unorganized sector had a very limited response to these highway upgrades. Therefore, one may argue that competitive pressure did not apply to unorganized plants in the manufacturing sector.

² Differences in completion points were due to initial delays in awarding contracts, land acquisition and zoning challenges, funding delays, and related contractual problems.

A channel through which large infrastructure investments elicit a differential response on the gender dimension is through migration of potential workers. As opposed to countries like China, there are no restrictions to labor mobility within India, and hence workers are likely to migrate in response to enhanced employment opportunities in new and more productive plants located close to the highways. Mobility in India, however, remains generally low due to the high costs of migration. Furthermore, the movement of women for work is extremely rare due to severe social frictions.

Trade: Trade liberalization and domestic industry reforms can influence gender differences in labor market outcomes primarily through three channels. First, trade liberalization and related reforms increase competition and encourage firms to reduce their costs. The pro-competitive effects thus diminish the scope for taste-based discrimination. Second, these reforms also bring technological change, as part of a cost reduction strategy or perhaps as a spillover benefit of an open trade regime, for instance. If technological change is skill-biased and men and women differ in terms of their education levels, this will have an effect on gender inequality. Third, reforms can prompt sectoral re-allocation of resources from import competing to exporting sectors in the case of trade, or from small firms to large firms in the case of de-reservation. A sizeable literature is devoted to studying the impact of trade liberalization on economic outcomes, including firm productivity and export performance in India and elsewhere. The gains from liberalization result from a reallocation of resources from less productive to more productive firms, through product shedding which forces firms to focus on their core competency and through enhanced access to higher quality intermediate inputs. Some studies suggest that business and labor regulations inhibit efficient reallocation of resources following trade liberalization. Thus, developing countries need to institute complementary policies to realize the potential benefits of trade reforms.

Trade liberalization has also been linked to reduced incidence of poverty and inequality. In the case of India, this link has been spatially evaluated by Topalova (2007, 2010). A district with higher exposure to tariff liberalization experienced lower reductions in rural poverty, while urban poverty is unaffected by these reforms. Her work suggests that rural and urban inequality were also unaffected by liberalization. Although a number of studies find small effects of trade reforms on wage inequality, they have been associated with reduced incidence of child labor, improvements in schooling and investments in human capital formation, and decline in urban unemployment.

Cross-country studies are mostly inconclusive on the impact of trade and globalization in promoting gender equality. For instance, the empirical relationship between trade flows and female labor force participation is often found to be contingent on the country's income level and economic structure and the time period considered. One of the shortcomings of cross-country studies is the lack of comparability of data across a range of countries. Studies using micro data at the level of households, employees and establishments offer a much broader scope for a detailed and meaningful analysis. Country-specific literature on the issue has documented a positive association between export-orientation and feminization of workforce. Some studies go further to establish that the causality runs from liberalization to better outcomes for female employment, that

is, trade liberalization is found to positively contribute to a convergence of male and female labor force participation and employment rates.

By comparison, using a panel of Indian formal manufacturing firms from 1998-2008, Banerjee and Veermani (2015) argue that, in spite of massive trade liberalization, India has witnessed a declining trend in female workforce participation rates since the late 1990s. Their results suggest that female employment intensity (FEI), defined as the share of all employees who are female, reduced as a result of trade liberalization. Reforms seem to have induced a skill-biased technological change, which promoted firms to hire more male workers at the expense of female workers, while the resource reallocation effect arising from India's comparative advantage in unskilled labor intensive industries, which could have potentially generated greater employment opportunities for largely unskilled Indian women, has been weak to deflect FEI in their favor. The observed skill-biased technological change emanating from reforms is a reasonable possibility given that India tends to specialize in capital and skill intensive manufacturing and services, a pattern incongruent to its comparative advantage, much noted in the literature. Moreover, reallocation of resources could have also been smaller than expected because even though trade liberalization addressed the barriers to participation in trade, India's factor markets, especially land and labor, remained highly distorted (Duranton et al., 2015, 2016).

We exploit the industry level variation in the pro-competitive trade liberalization reforms. Beginning in 1991, trade reforms opened the Indian economy by substantially reducing the tariff rates on a large number of products. These mostly exogenous reforms allow for an industry level long-difference analysis of trade-based competition. For empirical identification, these reforms offer ample variation internal to India. For example, the trade deregulations took place at different times for various products. This staggered timing in trade reforms across a range of products provides enough room to use an econometric tool to identify the stimulus in competition across industries.

Our empirical findings suggest a very limited correlation of tariff changes to participation of women in Indian manufacturing. Nonetheless, we do find that a reduction in trade protection is associated with a decline in segmentation among male-led plants. A positive correlation between trade reforms and segmentation among female-led businesses, however, dilutes our confidence in the link between trade liberalization-induced competition and gender segmentation.

Doing Business Reforms: India carried out a natural experiment with reservation and de-reservation of products pertaining to small scale industry. Although reservation of products for SSI is unique to India, many developing countries share this concern of promoting their small and medium firms. Since 1967, the Indian government started the SSI promotion policy with only 47 items. In three decades, the number of items reserved for SSI increased to more than 1,000 products. Starting with 1997 onwards, following the expert committee report (GOI, 1997), there was a gradual reversal in reservation policy which intensified in the mid-2000s. De-reservation could be perceived as a decline in fixed entry cost that naturally results in an increased competition

in the product market. Higher competition requires firms to raise their productivity to survive in the industry. The staggered timing of de-reservation across different products has been utilized by some studies to make an impact evaluation of such a policy change.³

This policy change promoted the growth of young entrants and incumbents that were previously capital constrained. Research suggests that districts that had a greater exposure to de-reservation during 2000-2007 showed heightened increase in employment and wages. Removal of restrictions on choice of products allowed formal Indian manufacturing firms to expand their size as measured by output, employment and capital. De-reservation also pushed greater improvements in productivity of Indian formal manufacturing firms.

Increased competition due to de-reservation is not the only channel through which such a policy change may impact the gender segmentation in Indian manufacturing. Recent research reveals that de-reservation of products exclusively for SSI changed the evolution of product churning, which pushed firm productivity to a higher level (Tewari and Wilde, 2015). Prior to the reform, reservation of certain products for SSI constrained the ability of multiproduct firms to achieve their optimal product mix. However, once the policy was dismantled, there was a significant increase in product scope among formal firms in Indian manufacturing. Product churning is thus an additional margin of reallocative activity, which, as in the case of trade liberalization, is likely going to have a gender dimension. If the de-reserved products were mainly unskilled labor intensive, for instance, then an expansion of product scope by formal and larger firms is likely going to increase their scale of production and thus have a positive impact on FEI.

Gender segmentation, on the other hand, could move in either direction depending on the proportion of de-reserved products appropriated by female entrepreneurs and the skills required in producing these de-reserved products. Thus, our work also contributes to studies of business practices in small firms and economic advancement in developing countries.

Our empirical results suggest that industry level de-reservations were positively associated with overall activity, in general, and specifically with female activity. Like the trade reforms, de-reservation reforms are also associated with a decline in segmentation among male-owned businesses, while they are associated with an increase in segmentation among female-owned plants.

Urbanization and Spatial Development: Spatial and locational traits generate higher levels of gender segmentation. But they do not respond differently to investments in infrastructure. We find that certain district traits such as the local infrastructure and technology usage play an important role in mitigating gender segmentation in India. Our work on the impact of pro-competitive reforms on gender segmentation points to the possibility that not all policies are equally effective in reducing discrimination. For instance, we find null effects of reforms that enhance competition

³ De-reservation policy was part of the major industrial policies, including trade liberalization and industrial licensing, but instituted a few years post the 1991 reforms.

in a spatial context. Specifically, districts located in proximity to the GQ highway did not witness an increase in activity of women or a reduction in segmentation post-upgrade.

By comparison, industry-specific pro-competitive reforms, such as trade liberalization and product de-reservation, are associated with a decline in segmentation among male employees and an increase in participation among women. The efficiency of the state underlies these features, and our project helps trace out how these traits govern their effectiveness in promoting competitive workforces.

Political Voice. India has experimented with several targeted policies that impact the social and economic well-being of women. Political reservations for women in India, for instance, have contributed much to investments in infrastructure or reallocation of public goods directly relevant to the needs of women, creating public works employment for women (Ghani, Mani and O'Connell, 2013), lowering crime against women (Iyer et al., 2012) and encouraging entrepreneurship among women in the informal sector. This strand of research basically argues that activating half of a country's potential workforce can be a significant driver of economic growth beyond promoting gender equality.

Nonetheless, despite significant economic advancement since liberalization, the role of women in the Indian economy still lags well behind that of advanced economies. Cross-country data from the World Bank Entrepreneurship Snapshots find that India's rates of business ownership (overall, and female-to-male ratio) and female labor force participation are lower than its stage of development would suggest. This dual under-performance has cultural and economic antecedents, but it is starting to change. Women are making economic gains in the Indian economy, and further progress represents a tremendous growth opportunity for the country. Our work contributes to this debate by utilizing pro-competitive policies as a possible channel for promoting greater participation of women in economic activity and reducing gender segmentation.

Conclusions

The international community, under the aegis of the United Nations, IMF, and World Bank has been pursuing gender equality since 2000, which now features as one of the primarily sustainable development goals (SDG). In this regard, empowering women to engage in productive employment is critical to achieving not only this SDG but is also pivotal to economic growth, poverty eradication, reducing child mortality, improving maternal health and attaining universal primary education. Gender inequality, in any society, is deeply rooted in attitudes, institutions and market forces. Social norms and attitudes in India have a long history of not affording women equal economic opportunities and social status.

This paper studies the pattern of female activity and gender segmentation in the Indian manufacturing and services sectors. Our results suggest a clear pattern of gender segmentation in both manufacturing and services, where, for instance, about 90% of employees in female-owned

business in unorganized manufacturing are females. Although India has undertaken many competitive reforms since the turn of the century, this pattern of gender based segmentation has not subsided over the years. Beyond this central result, we find that the share of female-owned plants in informal manufacturing is not only larger (39%, in 2010) than that in services (9%) but has also recorded a significant increase since 2001. Employment of females in services, although still lower than manufacturing in our sample, has recorded a significant increase since 2001. Finally, our descriptive work also sheds light on divergence in state and industry level patterns in female participation in entrepreneurship and employment as well as gender segmentation.

When examining the effect of competition on female participation in economic activity, our results with respect to investments in GQ transport highways are rather weak. In fact, as opposed to what theory would predict, we find that districts located farther from the highway witnessed decline in segmentation relative to those located close to GQ. As for trade liberalization reforms, we do observe a limited but expected decline in segmentation among male employees, but the evidence on segmentation among female employees is opposite to what theory would predict. Finally, de-reservation reforms that reduced the share of products reserved exclusively for small scale industries are deeply associated with increased activity, especially for females. It is also strongly correlated with decline in segmentation among male employees.

Our study suggests that globalization and trade policy made a limited contribution towards India's convergence in gender segmentation, while domestic pro-competitive reforms are strongly associated with lower segmentation among male employees. Thus, policies targeting the domestic competitive environment are perhaps more effective in mitigating discrimination in the labor market.

This paper examines the impact on gender segmentation and participation of women emanating from three of the many pro-competitive policies that India has undertaken in the last two decades. There are other policies such as political reservations for women, changes in labor regulations, and those pertaining to inheritance rights on property, which could be linked to segmentation in the Indian economy.⁴ Thus, future work in this field could include competition induced through other policies as well. Further, our work points to an interesting correlation of technology, as measured by Internet penetration, with gender segmentation in the services sector. We do not delve deeper into this association, and perhaps future studies could seek to understand the differences in the association of technology with gender segmentation in manufacturing versus services.

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⁴ It was only in 2005 that the government of India amended its inheritance laws to allow females an equal right to inherit their parent's land and property.

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