

Trade Openness and Female Employment: An Empirical Sectoral Analysis from Kenya

Charles Munene Gachoki

Abstract

Gender equality promotes a country's development potential and is therefore considered to play an important role in economic development. This study probes the effects of economic determinants on female employment in the agricultural sector in Kenya by considering economic and social factors. The study employs the ARDL approach for the period 1980-2019. There is a long-term link between economic and social determinants and female employment in the agricultural sector, which has been validated empirically. The results indicate that per capita income, inflation and exports encourage female employment, while foreign direct investment, fertility rate and imports impact female employment in the agricultural sector negatively in Kenya. The main policy implication based on results is that trade openness in form of exports should be promoted to increase female employment in the agricultural sector in Kenya. There is a need to shift Kenya's imports from food-based to capital-intensive imports to promote women's employment in the agricultural sector.



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Introduction

In the last half-century, most developing nations have acknowledged the important role that international trade has played in their economic growth and development. Trade policies, therefore, have been an important tool that governs the movement of foreign trade from the local market into the international markets. The government must implement various policies to enable the desired economic activities. Protectionist and liberal trade policies can both be used to facilitate those activities. Subsidies, export duties, and quotas are all examples of tariffs that function within the existing pricing mechanism. A trade policy administration that is either protectionist or liberal can be implemented. The government may take deliberate action to protect local manufacturing companies or rather shield them from foreign competition by imposing import tariffs or quotas. In contrast, the latter trade regime is one that favours trade with foreign countries. Mercantilist ideas are behind export-led growth strategies, which encourage nations to export more. Countries that are seeking to modernize their societies and raise living standards often look to implement this approach. It is an economic approach that many developing nations look to put in place to modernize their societies and increase standards of living. Finding a market for a product on the international market that other nations cannot easily or efficiently provide is the foundation of this strategy. As developing countries gain recognition on the global market, they can bring in positive cash flow that can be used to purchase products and services they are unable to produce themselves. Examples of countries that rely on export-led growth include nations that export oil in the Middle East and rapidly developing countries such as India and China. The key pillars of women empowerment, hence gender equality are education and employment. In their review of the implementation of the Brussels Programme of Action, the United Nations recognised the significant achievements in female education, particularly universal primary education and gender equality in school enrolment (UN 2011). The gender equality agenda has been at the forefront of global initiatives such as the Millennium Development Goals (MDGs) and later by International Monetary Fund (IMF) among other institutions. This had been driven by the growing body of evidence linking gender awareness in policy and projects to equitable, efficient, and sustainable outcomes in development (Artecona and Cunningham 2002). For instance, evidence shows that there have been rapid gains by semi-industrialized countries in women's share of employment. However, their work conditions have remained precarious (Wamboye & Seguino 2014). According to Wamboye and Seguino (2014), Sub-Saharan Africa (SSA) as a region has little but robust empirical evidence on gender and employment. Women make up a large proportion of subsistence agriculture workers in this low-income and agricultural-dependent region, compared to other broad sectors such as agro-processing in the manufacturing sector, and informal sector. Although it is not their employer of choice, their involvement in the informal sector and agricultural manufacturing sector is considered to be more of residual unemployment. The World Economic Forum (2022) global gender gap report 2022 paints a grimmer picture by indicating that the women's workforce outcomes are suffering and it will take at least 132 years to close the global gender gap. In Africa, only Rwanda (81.1%, 6th) and Namibia (80.7%, 8th) were in the top 10 economies that breached the 80 per cent gender equality mark. Kenya ranks at 73 per cent which is only 10 percentage points above the global average in 2022. World Economic Forum (2022) shows that the gender parity in labour-force participation for 102 countries has been slowly declining since 2009. SSA, Latin America and the Caribbean however negate this trend. Despite this positive trend in SSA, member countries have unexploited employment and gender equality opportunities in their economies that can further facilitate their intended development outcomes.

The selected SSA country Gender indices are given in figure 1.

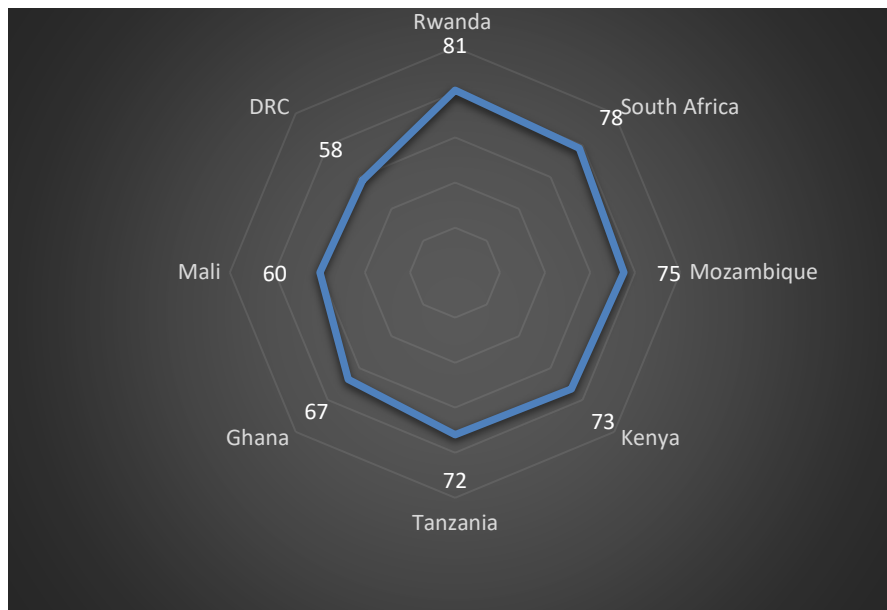


Figure 1. Gender Equality Index (2022)

Source: The Global Gender Gap Report 2022

Wamboye and Seguino (2014) provide evidence that there is a higher likelihood for men to thrive in export sectors in SSA for instance cash crops as well as mineral extraction, where gender equality has been achieved. Gender roles are relatively static, and women lack the resources to sell abroad, meaning is relative labour immobility between sectors. Because of this rigidity, women's employment opportunities in the export sector may have expanded more than men's in SSA, where gender job segregation is common and women lack the resources to facilitate labour mobility. The labour immobility, the export sector gender job segregation structure, and lack of resources by women could potentially explain the improvement of mens employment opportunities relative to women compared to economic outcomes in the SSA economies. As shown in figure 3, Agriculture is the main employer in Kenya and by 2010 there were more women in that sector than in any other sector (figure 4). This forms the basis of this study to analyse the effect of exports on female employment in Kenya. In addition, the relationship between exporting activity and female employment remains empirically ambiguous and therefore needs to be properly established, especially in the case of developing countries (Amin and Islam 2021). This study attempts to fill this gap in the literature.

Trade Openness and Labour Force Participation

In a globalized society, the pressure generated by competitiveness in trade enhances the cost of discrimination against women. The Less competitive nations -internationally are those that do not permit women to fully engage in the economy, especially those with export industries that have high female employment rates (World Bank 2011). Empirical studies show that trade improves women's outcomes. Companies that conduct business internationally employ more women. Compared to just 24.3 per cent of non-exporting enterprises and 28.1 per cent of non-importing firms, international trading firms in developing nations employ 33.2 per cent of women; Trade enhances economic equality and women's wages. Women's share of total manufacturing wages increases by 5.8 percentage points on average when developing countries double their exports of manufactured goods, which is crucial for developing nations that open up to trade due to increased employment and better pay; and Trade creates better

jobs for women. The percentage of people working worldwide has been falling since 1990, and it is predicted to continue to do so until at least 2030. The bulk of the workforce lives in Asia and the Pacific, and that is driving down participation rates in those regions. Participation rates in Asia and the Pacific are expected to fall below worldwide averages in the upcoming decades. Participation rates in Africa, in contrast, are forecasted to rise, dampening the global drop (ILO 2018).

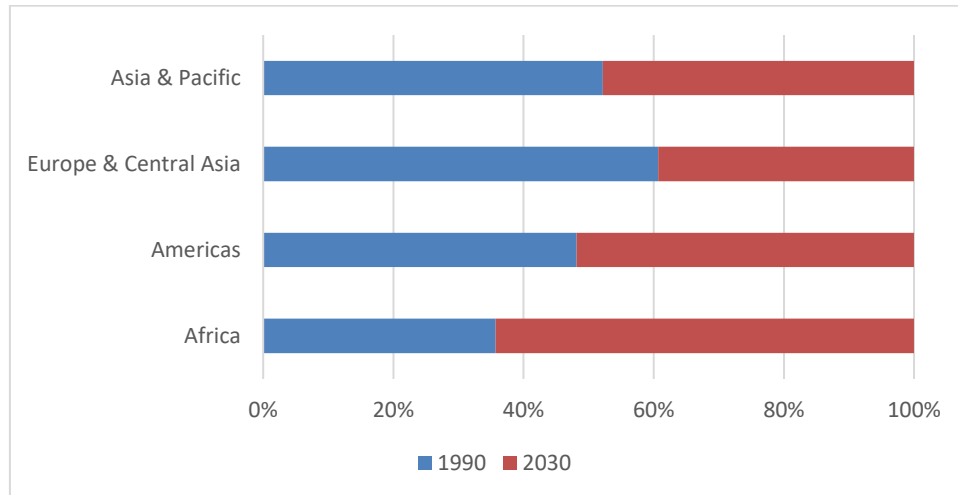


Figure 2: Distribution of the Global Labour Force by Region (1990-2030)

Source: ILO (2018)

The magnitude of the labour force participation disparity between men and females varies widely across the world (ILO, 2018). The gender gap in labour force participation is largest in South Asia, Arab countries, and North Africa. Conversely, sub-Saharan Africa, North America, Europe and parts of Asia have below-average rates of labour force participation. The global labour force participation gap narrowed by 2 percentage points from 29.1% in 1990 to 27% in 2018. The global labour force participation gap is projected to be 27% by 2030 (ILO, 2018). In countries such as Nigeria and Ethiopia, the participation gap between men and women has dropped by eight and 10 percentage points, respectively. The global gender participation gap is relatively constant, a situation that masks several important developments in both men's and women's participation rates. Between 1990 and 2018, both men's and women's participation rates declined globally, with men dropping by 5 percentage points and women dropping by 3 percentage points. Between 1990 and 2018, the female participation rate on average expanded with 4 percentage points in high-income countries, while emerging and developing countries recorded a 5 percentage point decline over the same period. Economies with a higher proportion of people working are likely to achieve greater economic growth and production capability. Increased labour supply and production capability may be generated by a higher labour force participation rate of both men and women, which increases a country's potential production and economic growth. Although economies with high participation rates can increase potential output and growth, changes in the participation rate in the short term are usually the result of changes in the business cycle and job-market trends. Greater external openness can lead to an expansion of the traded-goods sector, generating new employment opportunities, including an increase in female or youth participation in the labour market (Cooray, Dutta, & Mallick, 2017). The traded-goods sector such as financial services, tourism and information technology may be expanded by improved trade openness. This will create new opportunities for employment, particularly biased towards women. However, low levels of women's education combined with openness of trade increase competition and discourage labor force participation by women. The traditional trade model - Heckscher-Ohlin highlights

how trade-induced sectoral reallocation, could affect female workers. In developing countries characterised by a relative abundance of low-skill labour, the principle of comparative advantage suggests trade can increase female labour participation. Women workers in developing countries tend to be more abundant in low-wage, low value-added and labour-intensive export industries where the comparative advantage is higher. Empirical studies e.g. (Wood, 1991) found that the growth experienced by developing countries' exports in the 1980s and 90s had a positive correlation with increased female labour participation. Three channels through which trade can affect female labour participation have been proposed. First, exporting firms, are incentivized to reduce costs by hiring more women who earn lower wages relative to men due to stiff competition. The theory of competitive (rather than comparative) advantage hypothesizes that firms rather than relative advantage compete based on absolute costs of production in the export market. As firms compete to reduce absolute unit costs trade encourages the pursuit of lower labour costs. This may tempt firms to cut costs by hiring women (considered a cheap and flexible labour force hence taking advantage of gender inequalities because the relative bargaining power of groups of workers determines the wages. Consequently, women's pay may not necessarily increase even in situations where their employment increases. However, there is no evidence for this channel. The Second channel is premised on the proposition that trading firms can replace physically-demanding tasks by adopting new technologies to wade off rising competition hence having different effects on men and women in the workplace. However, these effects depend on whether the tasks performed by men and women have a complementary relationship with new technologies. Adoption of new technology makes women who had a comparative advantage in non-physically demanding tasks to be more productive. Junh et al. (2013, 2014) for instance demonstrate that North American Free Trade Agreement-induced export entry by firms that imported computerized equipment created higher wages as well as female employment compared to men to men in blue-collar jobs. The third channel proposes that discriminatory practices can be altered by trade-induced competition. According to the theory of discrimination by Becker (1957), it is assumed that employers have a discriminatory trait against women and a trait employers "are willing to pay" a price, particularly in low firm-based competition markets where monopolistic firms can afford higher wages for their male workers than their productivity would suggest. Trade liberalization would bring competition that makes this self-driven taste discrimination costlier. Oostendorp (2009) analysed a large cross-section of countries for the role of globalization on the gender wage gap and found that gender wage discrimination declines with increased trade liberalization and economic development. Similarly, Rocha and Winkler (2019) found that trade liberalization reduced discrimination leading to a positive effect on female labour demand in Uruguay and Colombia. A combination of cultural, social and economic factors presents differentiated effects of trade policies on economic and social activities between men and women: they may have dissimilar skills; face varied challenges and do not have access to productive resources equally. Due to these factors, it is not guaranteed that trade liberalization presents a straightforward positive effect on women's economic empowerment (UNCTAD 2016). The effects can be ambiguous where females may concurrently gain and lose from trade liberalization. They may, on one hand, have stable wage employment while on the other hand skills development opportunities are narrowed. if tariffs are reduced on products that represent an important portion of their consumption bundle, they may gain as consumers but if their produce competes with cheap imported goods they may be penalized (Williams 2007). However, the negative side-effects of trade liberalization are disproportionately more and present bigger challenges for women than men in taking advantage of the opportunities presented by increased trade openness. Such a situation is occasioned by gender biases in education and training, income distribution inequalities, and unequal access and command to resources, leading to notable occupational distribution gender-based differences (IANWGE

2011). To ensure that trade enhances opportunities for both men and women, it is important to analyse the potential impact of trade openness on both men and women to develop policy responses founded on evidence (World Bank 2020). Although gender issues concern both men and women, current policies and programs aimed at "gender equality" have put a seemingly disproportionate emphasis on women. This is because generally, men have traditionally had a dominant role in social relations, in particular those of authority and power. Another reason is how the notion of gender has emerged on the policy agenda. The focus on women can be seen as an effort to address an existing situation in which women have had limited access to assets, markets and political bodies than men (Jansen, Peters & Salazar 2011). There is a consensus that due to globalization, trade openness creates winners and losers through the reallocation of resources. Compared with males, females are more vulnerable to competition due to gender inequalities in wage gaps and job seeking (Fofana, Cockburn, & Decaluwe, 2005). Most of the empirical studies on employment and gender, proxy employment with labour force participation rate. This is chiefly due to the lack of sufficient data on gendered employment. Nonetheless, the labour force participation rate incorporates the unemployed, employed, and, in certain instances, those in the army rendering it an insufficient proxy for employment (Wamboye & Seguino 2014). Consequently, the main objective of this study is to analyse how economic and social factors have affected female employment in the three broad sectors. In the African continent, agriculture contributes to more than half of total employment for men and women and is the main export sector. There is a high share of women in total employment or the female intensity of employment in LDCs agricultural sector. Precisely, between 41 and 45 per cent of total employment in that sector constitute women (UNCTAD 2021). Firms are attracted to female labourers facing stiffer competition in international markets due to the relatively lower wages that women receive compared to men for similar work. The international market price competition tends to be particularly intense, and the price elasticity of demand is relatively high for labour-intensive products and is characterized by female-intensive export sectors. This means that wage increases in these female-intensive export sectors would crush profits and investment in contrast to male-intensive export sectors, in a price inelastic demand scenario. Such a dynamic could exert downward pressure on wages in female-intensive sectors. (UNCTAD 2021).

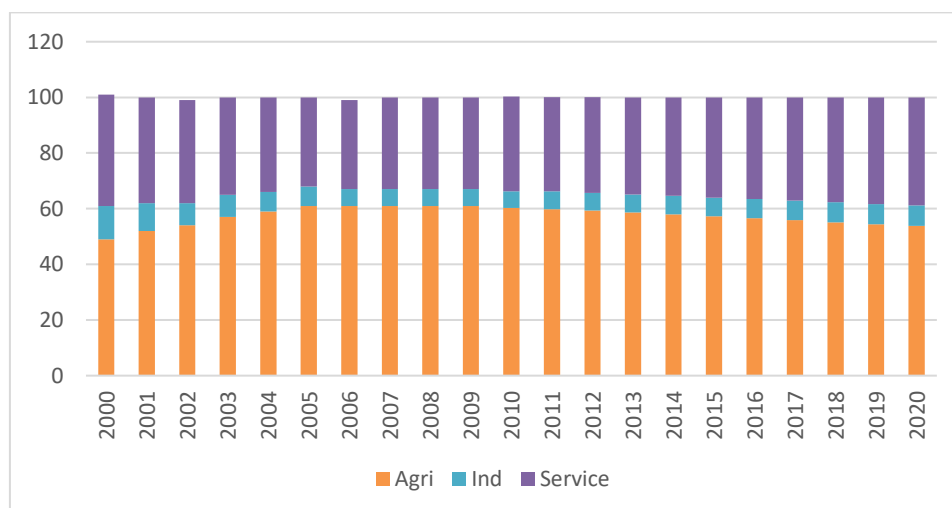


Figure 3 Employment by Sector (%)

Source: World Bank

By sector, the agricultural sector has been the main source of employment averaging over half of total employment in Kenya followed by the services and industry sectors respectively. In 2000, the sector employed 49 per cent of the workforce, the service sector (40%), while

manufacturing employed 12 per cent. Employment in agriculture improved by 12 percentage points between 2000 (49%) and 2005 (61%). During the same time, female employment in the sector increased from 3.3 million to 3.7 million during the same period (figure 4). This level of employment was maintained until 2009 when it started a downward trend to 53.8 per cent of the total employment in Kenya as of 2020. Since 2009, the services sector has been rising steadily from 33 per cent in 2009 to 38.7 in 2020. However, Wamboye and Seguíno (2014) point out that the service sector in SSA and other developing countries is typically associated with informal-sector employment, much of which is disguised as residual unemployment. A similar tendency was registered in the manufacturing sector, which accounted for 7.4 per cent from 6 per cent of the employment in the same period. Currently, Kenya is ranked 20 out of 34 African countries and 109 out of 153 countries in the Global Gender Gap Index (GGGI) 2020. 9 Kenya is ranked 114th out of 153 countries for economic opportunity and female engagement, with a gender parity score of 0.6. In 2020, fewer women (64%) will be employed than men (70%). In Kenya, women make less money than males for doing the same work, with a score of 0.7 out of 1. Female presence in management positions (18%) and company ownership by women (13%) is significantly lower than that of men (Mugenyi et al. 2020). The majority of female employees were working in Education, Agriculture, forestry and fishing and Public administration and defence (Republic of Kenya 2020). Figure 4 depicts female employment by sector.

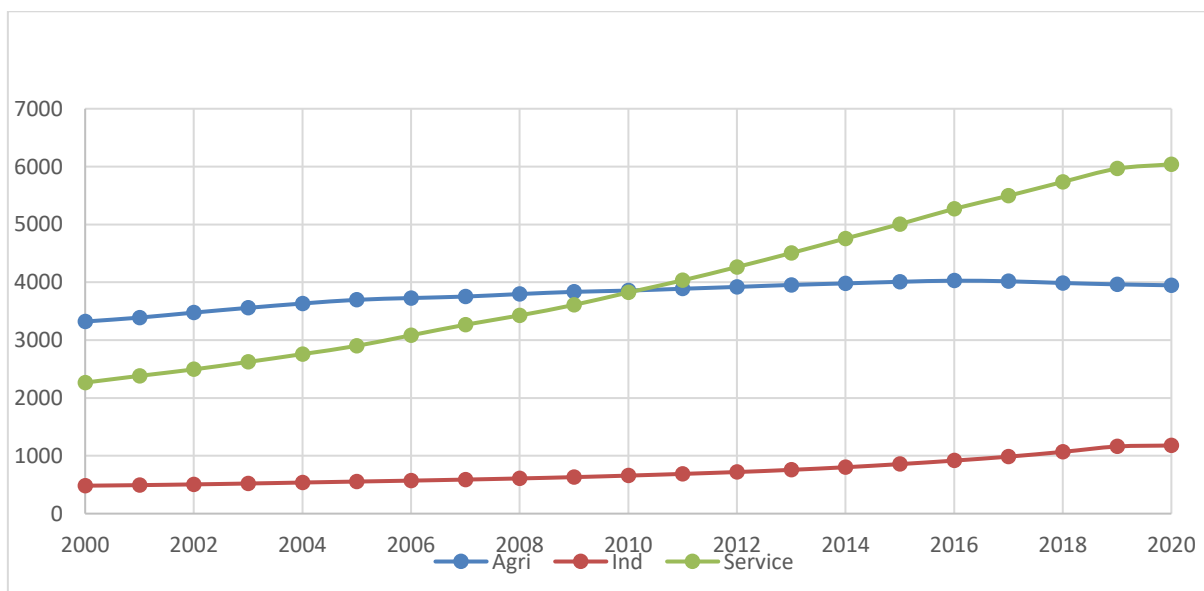


Figure 4: Kenya Female Employment by Broad Sector

Source: ILO

Women in Kenya constitute slightly more than half of the population based on the 2019 census even though their share in formal sector wage employment and their participation are lower compared to men. Women labourers are mainly concentrated in the informal agricultural sector and to a lower degree in agro-processing in the manufacturing sector (Kiriti 2015). Other studies such as Wamboye et al. (2015), have established that in both absolute and relative terms female employment and expansion in the agricultural sector are positively correlated when compared to male employment, but the relationship is opposite for the growth in the services, manufacturing and non-manufacturing sectors.

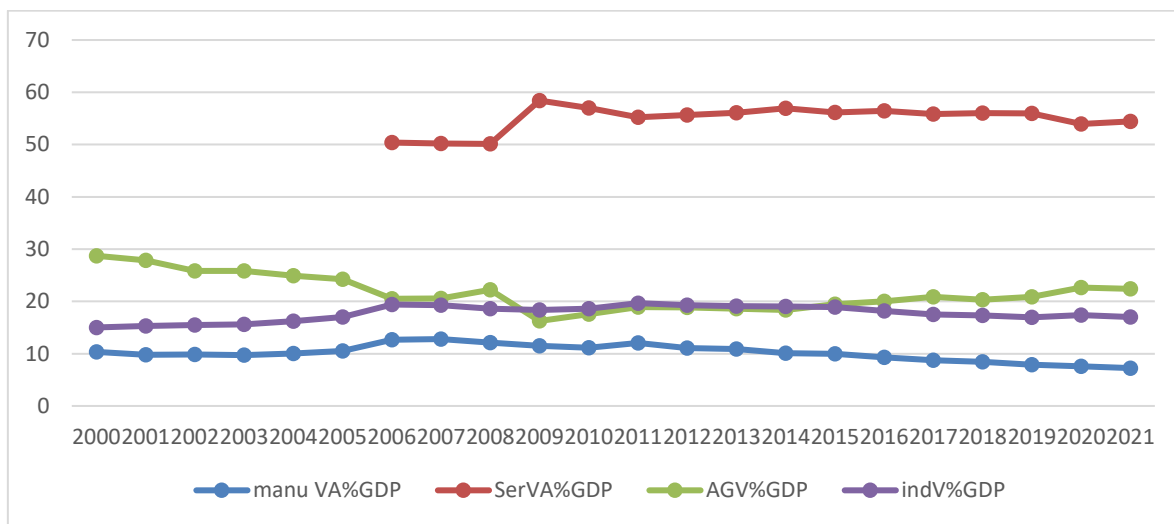


Figure 5. Sectorial Value added (Percent of GDP) Trend 2000-2020

Source: World Bank

Trends in Figure 5 show that, since 2009 while the contribution of industry, manufacturing and service sectors to Kenya's GDP has been on a downward trend, the agricultural sectors' growth has been on a rise. Evidence shows that women's ability to develop their capabilities, empowerment, and autonomy can be reversed by gender inequality. According to UNDP, (2019) notwithstanding little headway made since the 1990s, human development has continued to be constrained by gender inequality. Economic institutions and transactions are shaped by gendered power relations, biases on gender operate at the same time affect women in their economic functions as workers. Any economic analysis must introduce a gender perspective and consider both productive and reproductive activities (UNCTAD 2021). There are scanty studies concerning the effect of trade liberalization on women workers in Kenya. The output contributes to the body of literature in two aspects. First, there are no previous studies on the relationship between both economic and social indicators and female employment. Second, the study focuses on female employment in the agriculture sector, unlike aggregate employment.

Review of literature

The study of gendered employment and globalization has often been majorly premised on trade openness and Foreign Direct Investment perspectives. Onyeke and Ukuweze (2022) examined the relationship between trade openness and the female labour force participation rate in Nigeria and found that trade openness exerts a positive long-run effect on female labour participation. However, the effect is negative in the short run. The results contradict Su, Tao Li and Li (2020) who found that the female labour force participation rate initially increases with an increase in trade openness, and reverses in the long run. The authors argue that the results can be ambiguous and hence it does not mean the more a country opens trading activities the better for gender equality. As indicated earlier, the use of labour force participation rate is a poor proxy for employment. Further, exports and imports have been seen to have different effects on employment. This study makes up for this by using women's employment in the agricultural sector as well as treating exports and imports separately as proxies of trade openness. Literature also shows differentiated effects of imports and exports on labour participation. Samaan, Robertson, Lopez and Artuc (2019) argue that an increase in Indian and Sri Lankan Exports to the Organization for Economic Co-operation and Development (OECD) countries led to higher wages for India's export workers, but did not translate to increased jobs. The increase in wages benefited mainly college graduates, urban workers, and males. Positive changes in the agriculture sector output according to Wamboye et al. (2015) are likely to

considerably improve employment opportunities for women, and negative effects resulting attributed to growth in non-manufacturing industry, services, and manufacturing sectors. This is because women are inclined to be crowded in labour-intensive sectors with low wages. Jointly with effects by sectoral growth, other factors include better access to education, the level of industrial investment, and decreased fertility rates are central to the improvement of participation in the labour market by women. This study analysed the effect of the three broad sectors (agriculture, manufacturing and services) on female employment. This current study will however analyse the contribution of economic and social factors to women labour participation in the agricultural sector. The study also used an aggregate of trade openness which is corrected by separating the two trade components in this study for more specific effects. According to Heintz (2006), the effect of trade openness on employment are hinged on the structure of an economy's production and the relative bargaining power of men and women in the sectors where they work. Previous research in Asia, Latin America and Africa points to an emergence of international suppliers of goods who rely more on increased subcontracting of their production activities as opposed to direct production in a specific location. This has been strongly associated with the increase in export manufacturing in a range of developing countries, especially in textiles and garments, computer hardware, consumer electronics and related sectors, as well as in food production.

Based on empirical evidence, the performance of nations that have engaged in export of non-traditional crops or managed to grow the labour-intensive manufacturing export commodities has been superior to that of economies dependent on exports that are traditional primary goods in nature in narrowing the gender employment gap. Equally, there has been notable defeminization of the manufacturing sector in countries such as Mexico, South Korea, and Taiwan which have advanced their light manufacturing to more sophisticated electronics (Razavi et al. 2012). Kiss (2020) also argues that women are often over-represented in certain economic sectors and under-represented in others. This proposition is also supported by Kabeer and Mahmud (2004) who observe that the growth of women's formal and wage employment in many countries, has been concentrated in the export sectors produced for export. This is because Export-producing sectors prefer to employ women because of lower wage costs, flexible forms of employment can be introduced, and women are perceived to be more controllable. Heintz (2006) argues that the volume of exports and imports impacts the employment of both gender differently subject to the trade composition. In general, exports impact employment positively, while impact of imports is negative. While trade openness in form of exports improves women's employment, the expansion of imports negatively affects men's employment. If the expansion of trade involves an increase in both exports and imports, we are likely to see a "feminization of labour" as an outcome of trade liberalization. Additionally, the reduction of men's employment due to import penetration may increasingly reduce household resources and lead to an increase in female labour force participation. Moreover, if the growth in export sectors leads to an increase in women's employment, Heintz (2006) found that this would in turn lead to a less-than-proportional increase in male employment. This means the gains in women's employment as a result of exports can be cancelled by penetration of imports as happened in South Africa. Khalid (2013) evaluated the economic determinants of female labour participation and ARDL. The results indicated that national income and consumer inflation influence the female participation rate. One weakness of this study is the use of a poor proxy of women's participation which this current study improves by using female employment. The second weakness is the aggregation of trade in considering trade openness effects.

Research method

Theoretical framework

According to the Heckscher-Ohlin standard trade theory, countries where the relatively abundant factor is utilised, are expected to experience increased production as they liberalise their economies. Relative to skilled labour, there is an abundance of semi-skilled and unskilled labour in developing countries such as Kenya. The Stolper-Samuelson theory postulates that the most abundant factor of production would attract an increased demand and factor price especially if they are in the export sector which is labour intensive (in this case the semi-skilled and unskilled labour for developing countries). In developing countries where women are disproportionately represented compared to men in the semi-skilled and unskilled labour, this would increase their participation in the labour market. The theory of discrimination by Becker (1971) further argues that firms that can have a competitive advantage and enhance their profits can "buy discrimination". This is in terms of higher wages paid to male labours compared to females as compensation for males with a distaste for working with women labours in a closed economy or non-competitive market. Generally, such tendencies may erode productivity since the most productive female workers may be forced out of the labour force. On the other hand, the competitive advantage based on male-female labour discrimination can be eliminated in an open economy trading internationally and the excess profits are eliminated. Due to competition, any labour-based discrimination would not compete with non-discriminating firms. This means there is a positive relationship between trade liberalization and female labour participation (Artecona and Cunningham 2002).

The Model

The main objective of this study is to investigate the effect of trade openness on *female employment*. To achieve the objective this study adopted the augmented model used by Khalid (2013). Jaffri, Sana and Asjeed (2015) included a health variable (total fertility rate) while Onyeke and Okwueze (2022) modified it to include education. The functional form of the model is expressed as: $FAGRI = f(TO, FDI, Y, CPI, ED, TFR)$ 1

Where Female employment in the Agriculture sector (FAGRI) is the dependent variable. The regressors are Foreign Direct Investment (FDI), Trade Openness (TO), Per Capita income (Y), inflation (CPI), External debt (ED), and Total Fertility Rate (TFR).

Trade openness has been observed to have an ambiguous effect on male and female labour participation through the competition channel. According to the economic Discrimination model by Becker (1957), employers having discrimination tendencies toward minority workers will be outcompeted by non-discriminating employers as competition increases. In case domestic competition has been triggered by trade openness, women could benefit from declining discrimination in the labour market. while increased import penetration triggers an increase in competition, better access to foreign markets acts in the opposite direction, increasing profit margins and thus enhancing discriminatory behaviour (Yahmed 2010). Trade openness, therefore, presents two potentially counteracting forces– rising import penetration on the one hand, and increasing export orientation on the other hand. Others view liberalization and competition in much more pessimistic terms, arguing that trade liberalization reduces the bargaining power of female workers and hence they are more preferred by firms. Wamboye and Seguíno (2014) provide two reasons why imports and exports should be treated separately in analyzing trade openness effects on employment. Firstly, treating arguments for imports and exports separately permits for net exports to be negative therefore incorporating the demand-side effects of trade openness, even if the proportion of trade in GDP is positive. Secondly, feminist economists argue that low-skill labour

intensity and women's relatively lower wages make the developing country's export sectors to be feminized. However, Kenya is both a net importer and her export sector is characterized by the production of primary commodities and her manufacturing is based on agriculture hence hypothetically the effects on gendered employment would be potentially different. Beforehand, therefore, this study does not theorize the signs of the imports and exports coefficients ahead of the empirical analysis. The economic structure and trade composition may determine the gendered labour market effects of trade liberalization such that trade openness is expected to increase women's absolute job access, and relative to men in exporting sectors where they dominate employment, (Wamboye & Seguino 2014). The effect of *FDI* on *FAGRI* is hypothesised as ambiguous. *FDI* and domestic investment can encourage labour mobility in the market. Investment-induced economic growth generates additional job opportunities both for males and females. If the *FDI* is in the exporting firms, it leads to an increase in the labour demand. Therefore, firms find it cheaper in terms of costs in employing female workers since they earn lower wages hence increasing the *FAGRI* (Jaffri, Sana & Asjeed 2015). On the other hand, *FDI* which is technology-based in the agricultural manufacturing sector could advantage male (relative to females) computer and software engineers due to additional education and skills resulting in a lower *FAGRI* (Oostendrop, 2009). In a growing economy, women find it easier and are better placed to access work and are more likely to participate in the economy hence greater women participation in productive activities. Conversely, an economy going through negative growth presents an inhibiting environment characterized by poor social and economic factors that dampen further the opportunities for women's employment for females. Hence, GDP Per Capita (*Y*) positively affects *FAGRI*. In theory, external debt (*ED*) encourages economic expansion when directed to projects that are development oriented. However, should a significant amount of the debt is directed towards servicing the external debt, the results are economic activity contraction as well as a decrease in the labour demand for both men and women (Khalid 2013). An additional child according to Chun and Oh, (2002) diminishes the women's likelihood of working and hence this means TFR has a negative relationship with the *FAGRI*. Secondary time series data was used from 1990-2019 sourced from databases and publications of the World Development Indicators (WDI), International Labour Organization (ILO) and Kenya National Bureau of Statistics (KNBS). Due to its dynamic character and suitability for the data used, ARDL was chosen as the recommended model. Nkoro and Uko (2016) claim that ARDL is superior to other cointegration methods in the following situations: First, all the variables need not be integrated in the same order, i.e., they can be integrated $I(1)$, $I(0)$, or fractionally; Second, ARDL is more effective when using small and finite samples; Third, ARDL generates objective long run estimations; Fourth, both short-run and long-run dynamics can be determined at the same time when testing for cointegration; and, finally, ARDL is a dynamic model since it permits variables to have varying lags (Gachoki 2021). Using ARDL follows three steps. One, there is a need to determine the cointegration of the variables. The bounds test for cointegration is an idea put out by Nkoro and Uko (2016) to determine the long-term relationship between variables. The selection of the ideal lag duration for the ARDL model is required in step two following the formation of the long-run relationship. The ARDL cointegration approach can be used as long as there is cointegration between the variables under examination and as long as the no long-run association hypothesis cannot be disproved. The key to ensuring that the error terms obtained are Gaussian is determining the ideal lag length. The ARDL model must be reparameterized into an Error Correction Model (ECM) in order to include data for both the short run and long run in the third step. Equation 1, therefore, was augmented as:

$$\Delta FAGRI = \beta_0 + \beta_{1t} \sum_{i=1}^n \Delta FAGRI_{t-i} + \beta_{2t} \sum_{i=0}^n \Delta TO_{t-i} + \beta_{3t} \sum_{i=0}^n \Delta FDI_{t-i} + \beta_{4t} \sum_{i=0}^n \Delta INF_{t-i} + \beta_{5t} \sum_{i=0}^n \Delta Y_{t-i} + \beta_{6t} \sum_{i=0}^n \Delta TFR_{t-i} + \beta_{7t} \sum_{i=0}^n \Delta TDS_{t-i} + \beta_8 FAGRI_{t-1} + \beta_9 TO_{t-1} + \beta_{10} FDI_{t-1} + \beta_{11} INF_{t-1} + \beta_{12} TDS_{t-1} + \beta_{13} TFR_{t-1} + \beta_{14} Y_{t-1} + \epsilon_t \quad 2$$

Where β_1 to β_7 are the short run parameters while β_8 to β_{14} are the long run parameters and n is the optimal number of lags. TDS is a proxy of external debt measured as a percentage of debt service to total external debt. Several pre-estimation tests were carried out to apply ARDL. Economic time series variables commonly exhibit non-stationarity in their means. This leads to statistics which lack standard distribution which can potentially produce spurious regression results. First, the stationarity test was carried out using ADF.

Table 1. Augmented Dickey-Fuller Unit Root Test

Variable	Test statistic	Order of integration
LFAGRI	-2.742204***	I(0)
LCPI	-4.682029***	I(0)
LFDI	-5.488058***	I(0)
LM	-7.287484***	I(1)
LPCI	-4.324471***	I(1)
LTDS	-8.880226***	I(1)
LTFR	-6.097577***	I(1)
LX	-5.757736***	I(1)

*** show that probability is less than 0.01.

Secondly, the calculated F -statistic for the joint significance of the lagged variables was used to test for cointegration between the variables in models (2). The Pesaran Shin and Smith (2001) two sets of the adjusted critical value bound as I(0) and I(1) as lower and upper bounds respectively were adopted. According to the bounds test, if the lower bound is above the computed F -statistic then regardless of whether the variables are I(0), or I(1), the null hypothesis of no cointegration cannot be rejected. In case the upper bound is below the computed F -statistic, then the null hypothesis is rejected. The cointegration results are considered inconclusive if the computed F -statistics fall amid the two bounds. The last test is to determine the appropriate number of optimal lags (n) and the optimal n was achieved using the Akaike Information Criterion (AIC).

Results and Discussions

Table 2. ARDL Bounds Testing Analysis

Test Statistic	Value	k
F-statistic	12.91894	7
Critical Value Bounds		
Significance	I0 Bound	I1 Bound
10%	2.03	3.13
5%	2.32	3.5
2.5%	2.6	3.84
1%	2.96	4.26

The computed F -statistic for Model 2 is 12.9189 which is greater than the upper critical bound at the significance level of 5 per cent thus suggesting the presence of cointegration between female employment in the agriculture sector ($FAGRI$) and explanatory variables. Table3 presents the long-run coefficients.

Table 3. Long-Run Analysis

Dependent Variable: LFAGRI				
Independent Variables	Coefficient	Std. Error	t-Statistic	Prob.
LCPI	0.021864***	0.008951	2.442727	0.0258
LFDI	-0.025559***	0.009611	-2.659222	0.0165
LPCI	0.451755***	0.064474	7.006724	0.0000
LTDS	-0.028186	0.019655	-1.434072	0.1697
LTFR	-0.361290***	0.164021	-2.202698	0.0417
LX	0.572299***	0.100198	5.711677	0.0000
LM	-0.171093***	0.108993	-1.569761	0.0236

*** show that probability is less than 0.01.

The results show that growth in exports has statistically significant benefits for females working in the agricultural sector. This means women's job advantage widens as the export sector expands in Kenya. If the share of exports to GDP increases by 1 per cent, women's employment increases by 0.5 per cent while a similar increase in imports depresses women's employment in agriculture by 0.2 per cent. The results are in line with Wamboye and Seguíno (2014) who points capital intensive imports are not likely to affect women's access to jobs. In 2021 Kenya's most valuable imports included processed petroleum oil, palm oil, medication mixes in dosage, wheat and cars. Gender inequality is highly affected by exports (higher economic value of 0.5 per cent) rather than imports (lower and negative value of -0.2 per cent) since a relatively higher ratio of women as compared to men are absorbed by export-oriented firms. After all, exporting firms find it expensive to discriminate when competing in international markets (Atif 2015). The Economic value of inflation (CPI) and foreign investment is negligible 0.02 and 0.03 respectively. The positive relationship between inflation and female employment is similar to (Franke 1992) in Peru where women's response to higher prices was to enter the labour market. However, the coefficient for Foreign Direct investment is negative meaning a 1 per cent increase in FDI to GDP reduces women's employment by 0.03 per cent. According to Atif (2015), FDI which is technology-based in the services sector puts male computer and software engineers at an advantage relative to women due to more education and skills. Khalid (2013) also found that a 1 per cent increase in foreign direct investment reduced female employment by 0.05 due to the demand for skilled labour. A 1 per cent expansion of the economy (PCI) increases women's employment by 0.5 per cent. Females have easier and better access to work as well as being encouraged to become economically active as the economy grows, which results in a rise in female engagement in productive activities. Hence, income per capita (Y) positively affects $LAGRI$. The coefficient for TFR is positive and significant meaning an increase by one child per woman reduces their employment by 0.4 per cent. The results are in line with Jong, et al. (2017) who found that the number of children has a significantly negative effect on the woman's ability to work and reduces the odds of employment for African mothers by (6%). The impact of consumer inflation on the female labour supply is positive and statistically significant. A 1 per cent increase in inflation (measured by CPI) increases by 0.02 per cent. Khalid (2013) argues that inflation alters the consumption patterns of households forcing women into the labour market. The results indicate a low economic significance of inflation on women's employment in Kenya. In the short run, women's employment in the agricultural sector in Kenya is influenced by per capita income, inflation, total fertility rate, Foreign Direct Investment, exports and imports. Consumer inflation has a negative relationship with female employment. Francke (1992) found that austerity measures due to higher prices affect poor women via lay-offs. The Per Capita Income (PCI) hurts $LAGRI$ meaning that the substitution effect is higher than the income effect. Total external service does not influence women's employment in the agricultural sector. FDI increases women's employment in the first period however the economic value is negligible (0.5%).

Table 4. Short-Run Analysis

Dependent Variable: LAGRI				
Independent Variables	Coefficient	Std. Error	t-Statistic	Prob.*
LAGRI(-1)	1.260328	0.039944	31.55270	0.0000
LCPI	-0.005692***	0.002602	-2.187384	0.0430
LFDI	0.001188	0.001684	0.705360	0.4901
LFDI(-1)	0.005466***	0.001955	2.795355	0.0124
LPCI	-0.135923***	0.015398	-8.827185	0.0000
LPCI(-1)	0.018318	0.014230	1.287310	0.2152
LTDS	0.007338	0.005574	1.316394	0.2055
LTFR	-0.094054***	0.035778	-2.628821	0.0176
LX	-0.048986***	0.017859	-8.342198	0.0000
LM	0.070573***	0.021626	3.263366	0.0046
R-squared		0.996550		
Adjusted R-squared		0.994521		
S.E. of regression		0.006449		
F-statistic		491.0521		
Prob. (F-statistic)		0.000000		
Prob. J-B Test		0.060261		
Prob. ARCH Test		0.9961		

*** show that probability is less than 0.01.

Standard diagnostic tests are applied to ensure that the OLS estimator meets the OLS assumptions. The J-B test statistic (5.618126) has a probability (0.060) greater than 0.05, indicating that the residuals are normally distributed. To check for autocorrelation, the LM test was used and the probability of the LM test was (0.4311) exceeding 0.05, indicating no serial correlation.

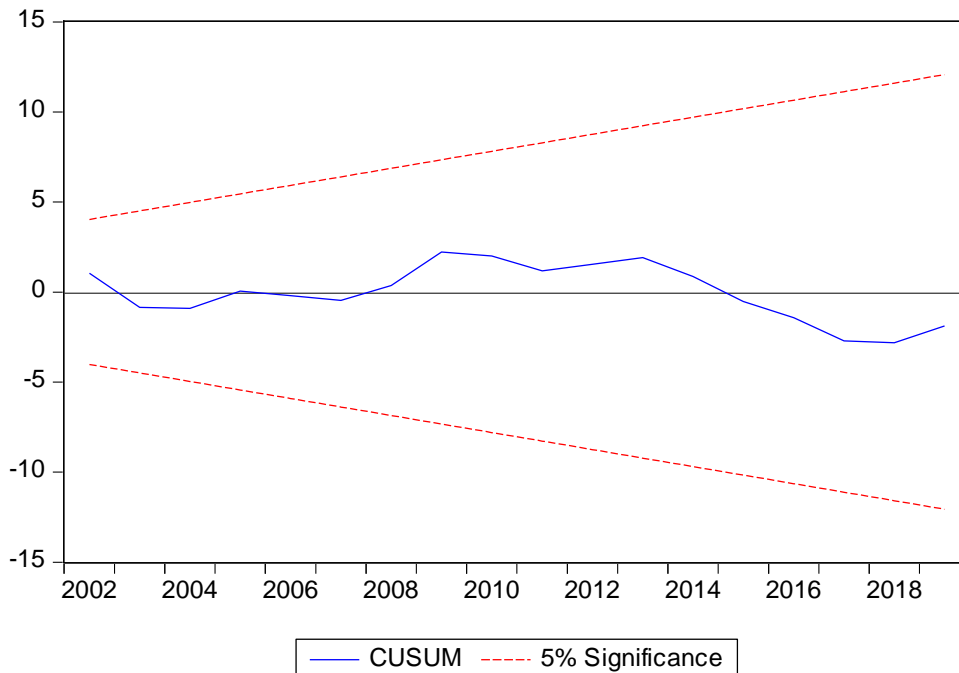


Figure 6. CUSUM Test

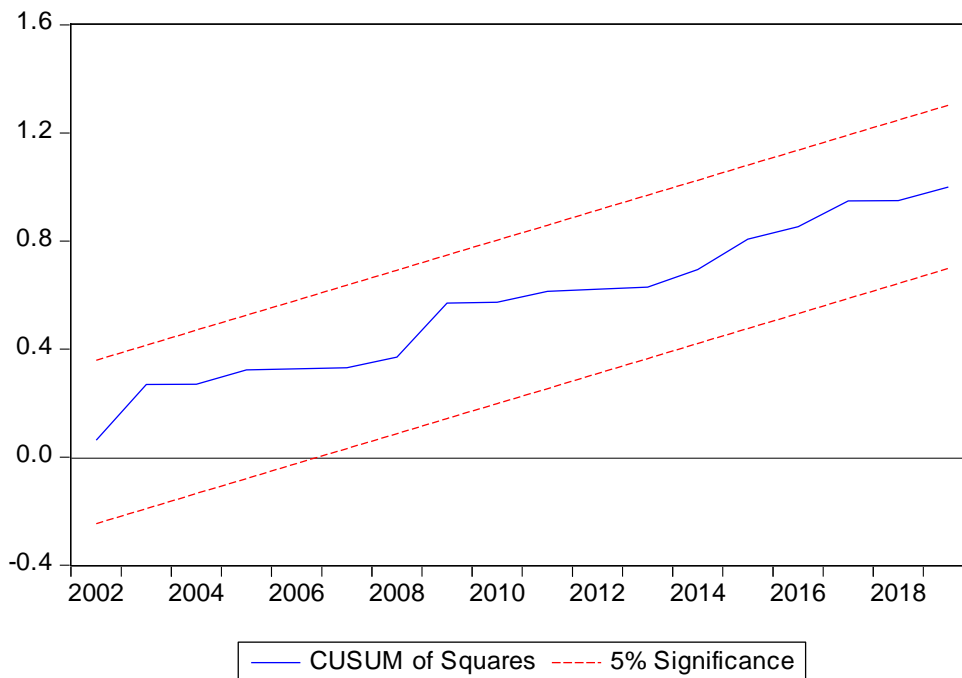


Figure 7. CUSUM of Squares Test

Results of the ARCH test also confirm the null hypothesis of the absence of heteroskedasticity. Results of the Ramsey Reset test also show that model is correctly specified. The stability of parameters was tested using CUSUM and CUMSUMSQ tests which confirmed the stability of parameters in the model.

Conclusion

The main objective of this study was to investigate empirically the relationship between trade liberalization and gender-based labour market inequalities in Kenya. To fulfil this objective, an ARDL model was estimated for two indicators: (*LFLAGRI*) and trade openness (represented by exports share of GDP and imports share of GDP). The study used time series annual data from 1980 to 2019, an ARDL model was estimated using OLS technique. The empirical evidence validates the presence of a long-run relationship between the economic and social determinants and female employment in the agricultural sector. The results indicate that per capita income, inflation and exports encourage female employment, while foreign direct investment, fertility rate and imports impact negatively female employment in the agricultural sector in Kenya. The main policy implication based on results is *TO* (in form of exports) should be promoted to increase female employment in the agricultural sector in Kenya. Further, capital-intensive imports are not likely to displace women from employment. Kenya's import composition needs to shift from food-based to capital-intensive.

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