DOES ECONOMIC INTEGRATION INCREASE FEMALE LABOUR FORCE PARTICIPATION? SOME NEW EVIDENCE FROM VIETNAM

Seema Narayan*, Tri Tung Nguyen** and Xuan-Hoa Nghiem***

*Corresponding author. Independent Researcher, Melbourne, Australia. Email: swdhar27@gmail.com
** Department of Economics, Ho Chi Minh National Academy of Politics, Vietnam.
*** Faculty of International Economics, Foreign Trade University, Vietnam.

ABSTRACT

While several studies have, directly or indirectly, showed the importance of economic integration in job creation and destruction, direct empirical evidence for Female Labor Force Participation (*FLFP*) is still sparse. We take the case of Vietnam – a country that has come out of poverty largely due to her export-induced economic growth – and examine the impacts on FLFP of economic integration over the period 1999-2014. Our results suggest that Vietnam's export sector, which relies heavily on foreign direct investment and free trade agreements, is an important contributor to FLFP. Economic integration with high-income countries (compared to middle- and low-income countries) was found to be most beneficial to FLFP in Vietnam. Our results also indicate that some traditional drivers of FLFP (such as fertility rate, health status, female adolescents out of secondary school, government education spending, and standard of living) became more (or less) important as Vietnam became more economically integrated.

I. INTRODUCTION

In many countries, economic integration led to the growth of export-oriented industries, such as garment and light manufacturing, which employ large numbers of women (World Bank, 2012). However, several researchers, for example, Goldin (1990, 1994), Mammen and Paxson (2000), Steel (1981), and Tsani et al. (2013), who study the relationship between economic growth and female labour force participation (FLFP), warn that female-intensive sectors in low-to-middle-income countries can shrink as part of the process of deeper economic integration.

Research on the direct impact of economic integration on the labour market (Hasan et al., 2012; Ma et al., 2015; Ranjan, 2012) or the female labour force participation (Gaddis and Pieters, 2017; Korinek, 2005; Sauré and Zoabi, 2014), which is still strikingly limited, confirms that economic integration can create and destroy jobs. More importantly, findings from this emerging body of research imply that the study of the relationship between female labour force participation (or labour market) and economic integration is non-trivial. Korinek (2005) reported that trade creates jobs, particularly in export-oriented sectors, while Grabowski and Self (2014) found that in low-income countries trade increases female labour force participation in non-agricultural sectors. While Ranjan (2012) noted that economic integration can destroy jobs, Ma et al. (2015) showed that industries (or sectors) more exposed to trade openness are likely to enjoy more job creation and less job destruction. Meanwhile, Hasan et al. (2012) noted that the effect of trade liberalization on the labour market may be negative in the short run, but positive in the long run. Sauré and Zoabi (2014), on the other hand, showed that the impact of trade/trade liberalization on female labour force participation depends on whether the exporting/importing countries are capital-rich or capital-poor.

Our contributions to this emerging literature are as follows. First, we examine the importance of economic integration on female labour force participation in Vietnam. Vietnam is a transition economy that saw a decline in in female labour force participation over the two decades 1990 to 2010 (Figure 1, Panel 1). However, since the economic reforms ('Doi Moi') of 1986, Vietnam's export industries, which are strongly reliant on foreign direct investment (FDI) and trade agreements, have been the engine of significant economic progress. Of its export industries, the textile and clothing sector is the largest employer of female labour.[1,2] The Multi-Fiber Arrangement (MFA), 1974-2004, and Vietnam's accession the WTO in 2007 are the relevant trade agreements for female labour force participation in Vietnam; as a result, the MFA and WTO periods are captured in our empirical analysis. In the MFA period, exports from the textile and clothing industry were subject to the extensive application of quotas by the major importing countries (the EU members and the USA). Since 1992 a trade agreement with the EU gave Vietnam preferential garment quotas for the EU market. Further, Vietnam re-engaged with the US market after the US trade embargo was lifted in 1994. Relations between the two nations deepened with the signing of a bilateral trade agreement in 2000,

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[1] According to World Bank Enterprise Survey, cited in Asian Development Bank Institute (ADBI, 2017), this industry absorbs the largest the share of female workers compared to other sectors.

[2] Vietnam has a comparative advantage in such products as, rice, rubber, coffee, pepper, aquaculture and timber (Bui & Chen, 2017; Thanh & Duong, 2011). These exported products are some of the key contributors to the Vietnamese export volume over time (Noburu, 2017; Ngo and et al., 2016).

which led to a reduction of average tariffs for Vietnamese exports to the US from around 35% to 5% (Nadvi et al., 2003; Nadvi et al., 2004). The period leading up to Vietnam's membership of the WTO in 2007, and the years that followed, also capture a shift in Vietnam's comparative advantage from labour-intensive manufacturing to technology-intensive manufacturing (see, Le, 2010). Moreover, compared to the MFA period, the WTO period captures a much stronger process of economic integration for Vietnam and other WTO members, hence we expect to see some differences in the response of female labour force participation to economic integration in the WTO and MFA periods.

Second, we conduct regression analyses to determine the importance, or not, of trading partners in forging a relationship between trade and female labour force participation. More specifically, we use bilateral exports flowing from Vietnam to a trading partner. Trade relations differ between trading partners and can vary over time. In this regard, the bilateral exports data delivers much richer information than aggregate exports data to attest the changes in female labour force participation.

In this paper we examine the role of Vietnam's exports flowing to its 54 top trading partners. We categorize Vietnam's trading partners into four groups: one group captures all 54 top trading partners; and three sub-groups consist of trading partners by their income level. This follows from the work of Narayan and Nguyen (2016) which shows the importance of trading partners' economic status in determining trade in Vietnam.[3] Besides, as noted above, Sauré and Zoabi (2014) implied that the impact of economic integration on female labour force participation depends partially on the trading partners. Our analysis identifies trading partner groups that increase or decrease female labour force participation more than the others. Hence, from a policy perspective, such analysis can lead to the formulation of more focused policies that are clear in direction as well as impact.

Third, we check the importance, or not, of the economic integration variable in the female labour force participation model. To this effect, we develop female labour force participation models with and without economic integration variables. This approach allows us to compare the performance of models with and without economic integration variables, and at the same time check for any noteworthy transformations that occur to the relationships between female labour force participation and its traditional determinants after the inclusion of these economic integration variables. In our models, the traditional determinants of female labour force participation include fertility, education and the health status of workers, and government policies surrounding education and training. As a result, our approach intends to explain, to an extent, the role of economic integration in affecting government education and training policy, job security perceptions, and working conditions for female workers in Vietnam.

Foreshadowing the key findings of the paper, our regression analyses suggest that the female workforce in Vietnam responds positively and significantly to trade. In other words, trade has contributed to creating jobs for the female workforce. Through our sub-sample analysis of the trading partners by income

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[3] Also see Narayan and Bui (2019) and Narayan and Nguyen (2019).

groups, we reveal that while trade with all trading partners exert a positive effect, the magnitude of the effect of trade depends on the trading partner. We find that Vietnam's exports to higher income countries have led to more job creation for the female workforce than middle- or low-income countries. The study also finds that female labour force participation was higher during the MFA period compared to the non-MFA (or WTO) period studied. This is saying that despite job prospects, recent years have seen a decline in female labour force participation. Our study also finds that economic integration of the Vietnamese economy may have affected the relationship between female labour force participation and its traditional determinants, including economic growth.

The remainder of the paper is organized as follows. Section II explains female labour force participation and bilateral export trends, and the impact of MFA and WTO on the Vietnamese economy. Section III presents a review of the literature on female labour force participation, highlighting the theoretical foundation of female labour force participation studies and the empirical studies that test this theoretical basis, using traditional and economic integration related variables. Section IV presents the empirical model of female labour force participation. The model includes the economic integration variables (MFA, WTO, and trade) and the traditional drivers of female labour force participation. Section V presents the data, some preliminary analysis, including unit root and Granger causality test results, followed by a discussion of the main empirical findings in Section VI. Section VII concludes the paper with a summary and policy implications.

II. FEMALE LABOUR FORCE PARTICIPATION AND ECONOMIC INTEGRATION IN VIETNAM

The agricultural sector in Vietnam has been the traditional employer of females, although over recent decades, female labour force participation has declined from 70.4% in 1996 to 48.8% in 2013 in this sector (see Table 1). On the other hand, manufacturing and service industries have seen an increase in female employment. Female employment in manufacturing (services) has increased from 8.8% (20.7%) in 1996 to 17% (34.2%) in 2013. Over the period 1996-2013, female representation in agriculture related employment in Vietnam has averaged 61.2%. In the services related workforce, female employment averaged 26.4%, while female representation in manufacturing related employment averaged 12.3% over the same period.

Table 1.
Female Employment by Sector in Vietnam (% of Total Female Employment)

This table presents the share of female employment in agriculture, manufacturing and services as a percentage of total female employment. Self-employed females as a percentage of total female employment are presented in column 5.

Year	Agriculture	Manufacturing	Services	Self-employed
1996	70.4	8.8	20.7	86.1
1997	66.0	10.4	23.5	84.6
1998	65.6	9.2	25.2	82.0
1999	65.5	9.9	24.7	84.0
2000	66.3	10.1	23.6	83.4

Table 1.
Female Employment by Sector in Vietnam (% of Total Female Employment)
(Continued)

Year	Agriculture	Manufacturing	Services	Self-employed
2001	65.0	11.2	23.9	81.3
2002	63.2	11.7	25.1	82.1
2003	61.7	13.0	25.3	81.3
2004	60.0	13.7	26.3	78.8
2006	53.8	15.9	30.3	N.A
2012	49.5	16.8	33.7	70.9
2013	48.8	17	34.2	70.5
Average (1996-2004)	64.9	10.9	24.3	82.6
Average (2006-2013)	50.7	16.6	32.7	70.7

Source: World Bank Database, DXTime.

These sectoral trends depict the structural changes that have occurred in Vietnam over recent decades. The economic importance of agriculture in Vietnam has diminished amid a strong preference for growth in industries, including manufacturing, construction, electricity, water, and gas (see Table 2). Over the period 1990-1999, the agricultural sector on average contributed 30.2% to the Gross Domestic Product (GDP) of Vietnam. This fell to an average of 18.9% over the period 2007-2014. Over the same periods, the contribution of industry to Vietnam's GDP increased from an average of 28.9% in the period 1990-1999 to 34.7% in the period 2007-2014.

Table 2.
Average Share of Agriculture, Manufacturing, Industry and Exports to GDP in Vietnam (%)

This table presents mean share of agriculture, manufacturing, industry, and exports as a percentage of GDP. Industry as a percentage of GDP comprises the value added in mining, manufacturing (also reported as a separate subgroup), construction, electricity, water, and gas.

| Average	Agriculture	Manufacturing	Industry	Exports
1986-1989	41.7	20.6	26	10
1990-1999	30.2	15.2	28.9	38
2000-2005	21	18.4	36.3	54
2007-2014	18.9	15.3	34.7	76

Source: World Bank database, "http://data.worldbank.org/country/vietnam"

In the same way, exports have accelerated to become the main driver of economic activity in Vietnam (Figure 1). Over the period 1986-1989, total exports on average only contributed 10% to Vietnam's GDP, but by the period 2007-2014, the average share of exports to GDP grew to 76% (Table 2, column 5). Hence, economic growth in Vietnam is strongly driven by exports. As captured in Figure 1, export performance is closely linked to Vietnam's economic growth, with the troughs and peaks in economic growth coinciding with the respective dips and high points in export growth, with both series becoming more synchronized in the more recent years.

Figure 1.
Vietnam's Female Labour Force Participation (FLFP) Rate and its Determinants

Panel 1: Vietnam's Female Labour Force Participation (FLFP) rate, growth of nominal GDP and exports: 1985-2014 (%)
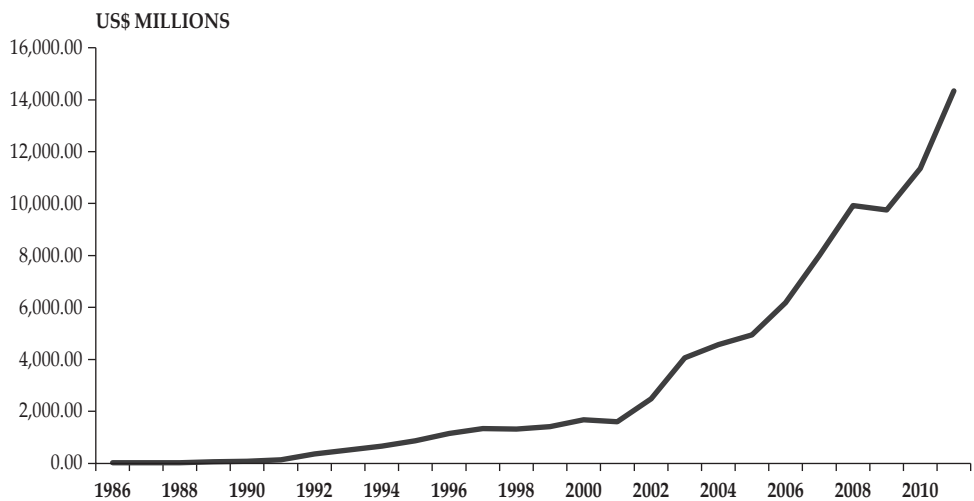This panel captures Vietnam's FLFP rate and growth of nominal GDP and exports.
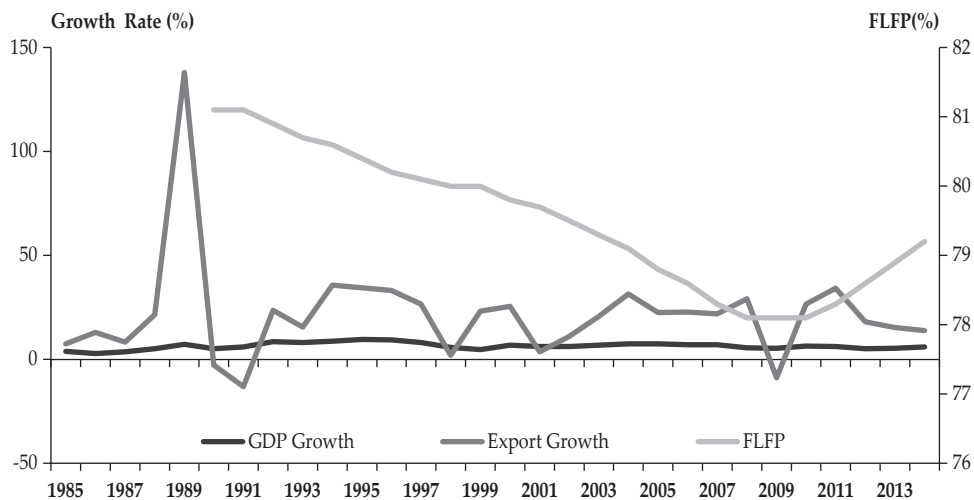
Source: World Bank WDI, Reuters DataStream and authors' calculations

Panel 2: Vietnamese exports for articles of apparel and clothing, SITC, Rev.2
This panel captures Vietnam's exports of apparel and clothing.

Source: United Nation Trade Statistics, 2012

Figure 1.
Vietnam's Female Labour Force Participation (FLFP) Rate and its Determinants
(Continued)

Panel 3: Vietnam's data on female labour force participation (FLFP) and its determinants
This panel captures the data series for Vietnam: government expenditure on education (*EDUEXP*); fertility rate (*FERTI*); female life expectancy, at birth (*FLE*); female labour force participation (*FLFP*); female adolescents out of secondary school (*FOUT*); and GDP per capita (*GDPP*).
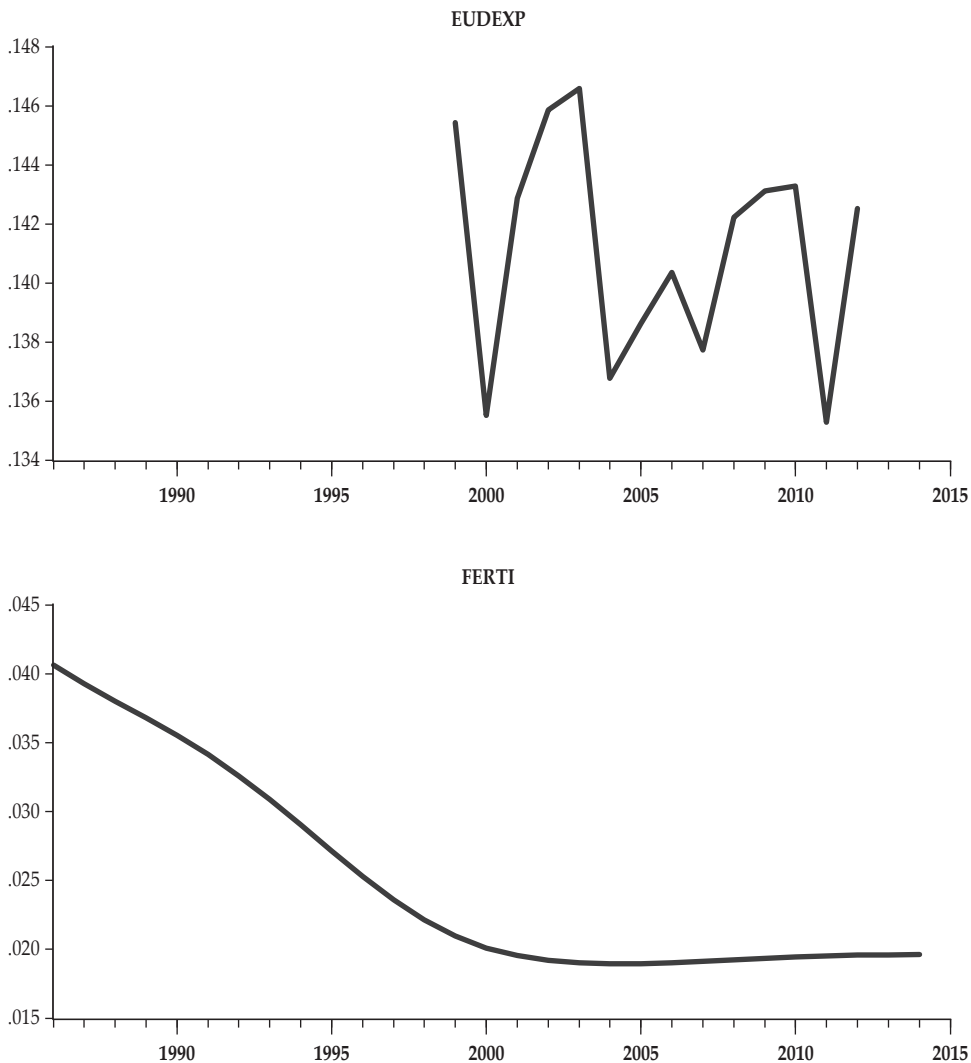

EUDEXP

FERTI

Figure 1.
Vietnam's Female Labour Force Participation (FLFP) Rate and its Determinants
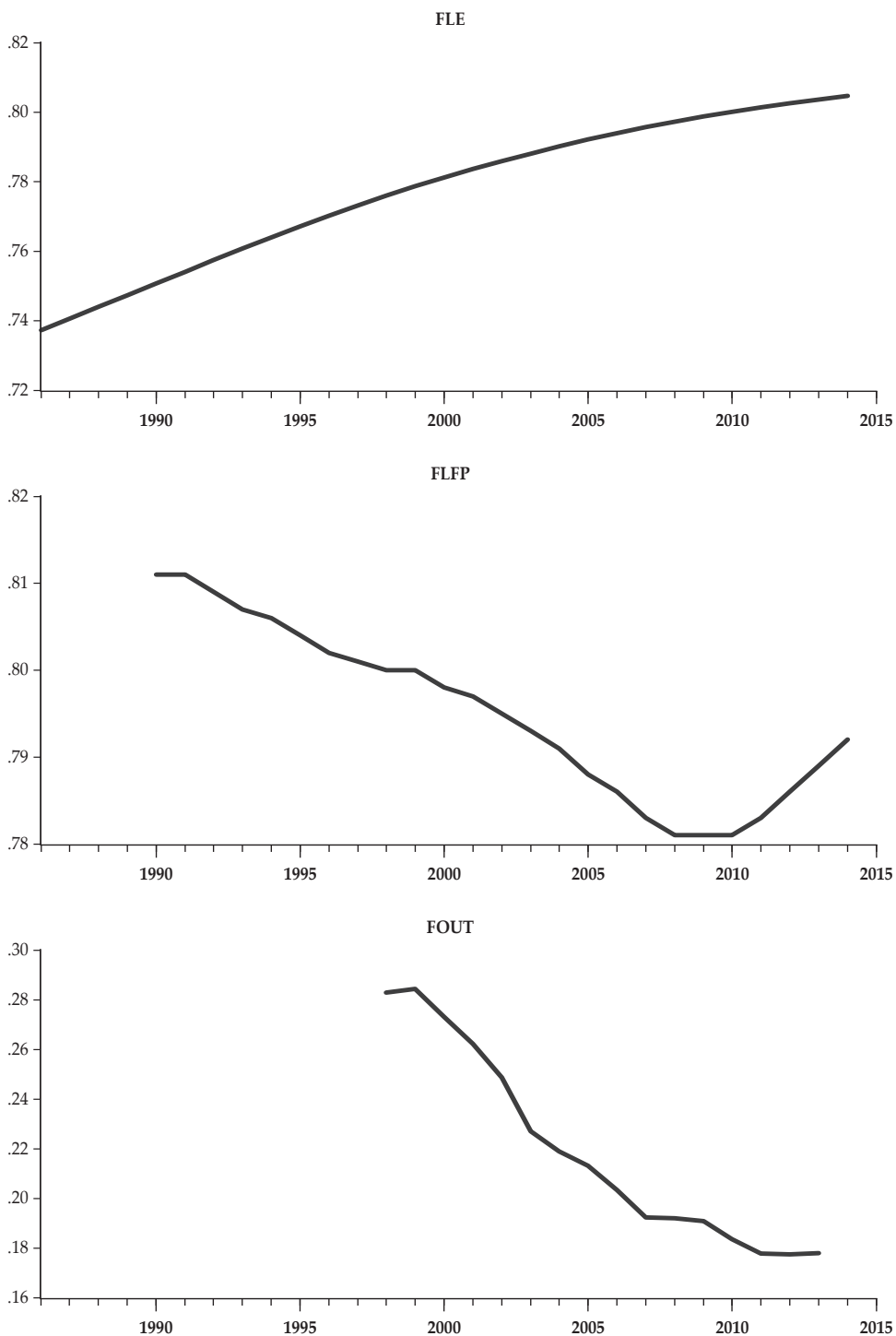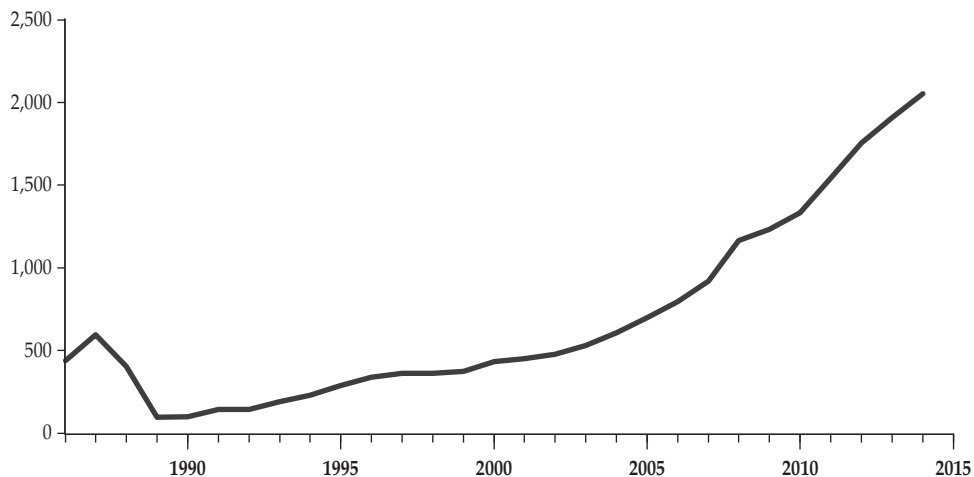**(Continued)**

FLE

FLFP

FOUT

Figure 1.
Vietnam's Female Labour Force Participation (FLFP) Rate and its Determinants
(Continued)

GDPP

Source: World Bank WDI and authors' calculations

Table 3 shows the evolution of exports through time for Vietnam since 'Doi Moi', the economic reforms instigated by the government in 1986. Average trade share (measured by share of exports to GDP) has expanded significantly: roughly by four times larger between the two periods (1986-1989) and (1990-1999); and about seven and a half times larger until the period (2006-2014) (Table 2; also see Narayan and Nguyen, 2016). One of the reasons for this impressive trade growth and integration into the world economy has been Vietnam's membership of different trade blocs, including the ASEAN (membership since 1995), the APEC (1998), and the WTO (2007).[4]

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[4] Narayan and Nguyen (2016) show that Vietnamese exports have improved over the period 1999-2010 due to WTO, APEC, and ASEAN memberships. The study applies gravity trade models to quantify the impact of economic integration on Vietnamese bilateral exports for a sample of 54 trading partners of Vietnam. This research reports that ASEAN and APEC memberships can boost bilateral exports from Vietnam to those trading partners classifying as low and lower middle-income countries and high-income countries in the long run. Further examination of the regional trade suggests that ASEAN and APEC preferences can improve Vietnamese bilateral trade to trading partners in Asia and Europe. Although WTO membership discouraged bilateral trade in the long-run, in the short-run this membership positively stimulated bilateral exports to most of regional and income-trading partners during the study period (also see, Narayan and Nguyen, 2019; Narayan and Bui, 2020).

Table 3.
Timeline and Events for Economic Integration, Vietnam (1986-2016)

This table outline the key events for economic integration in Vietnam.

Years	Events
1992	Trade agreement with EU signed
1994	The US lifted its embargo on Vietnam
1995	Vietnam joined Association of South East Asian Nations (ASEAN); WTO application submitted
1996	Co-founder of Asia-Europe Meeting (ASEM); Tariff reduction began – following AFTA/CEPT designed by ASEAN
1998	Vietnam joined Asia-Pacific Economic Cooperation (APEC)
1999	MFN agreement with Japan
2000	Bilateral Trade Agreement (BTA) between US and Vietnam signed
2002	US-Vietnam BTA implemented
2003	Vietnam joined the Pacific Economic Cooperation Committee
2004	Bilateral Trade Agreement between EU and Vietnam on WTO accession
2006	Final bilateral agreement for WTO Accession reached; CEPT/AFTA started by ASEAN
2007	Vietnam became a formal member of WTO
2008	Vietnam-Japan Economic Partnership Agreement
2015	Vietnam-South Korea Free Trade Agreement
2016	TPP (Trans-Pacific Partnership Agreement)
2018	Expected: Comprehensive and Progressive Agreement for Trans-Pacific Partnership Agreement (CPTPP)

Source: Globalization crisis, trade, and development in Vietnam, Abbott and Tarp (2012), Narayan and Nguyen (2016), and authors' compilation.

It is also true that Vietnamese exports are strongly driven by foreign owned companies (through Foreign Direct Investment (FDI)). By 2005, foreign invested sectors surpassed the domestic economic sectors as main contributors to Vietnamese exports (see Table 4). The FDI flows into Vietnam have surged over the last two decades, during which FDI has flowed into production of goods and services for the purpose of export to the world market. The positive effect of FDI on Vietnamese exports is also empirically evident (see, Anwar and Nguyen, 2011; Athukorala and Tien, 2012).

Table 4.
Goods Export by Domestic or Foreign Counterparts: Vietnam (1995-2015)

This table displays the value of goods exports by domestic and foreign owned companies in Vietnam.

	1995	2000	2005	2010	2015
TOTAL ($US Mil.)	5,448.9	14,482.7	32,447.1	72,236.7	162,016.7
Domestic economic sector	3,975.8	7,672.4	13,893.4	33,084.3	47,636.3
Foreign invested sector	1,473.1	6,810.3	18,553.7	39,152.4	114,380.4
TOTAL (%)	100.0	100.0	100.0	100.0	100.0
Domestic economic sector	73.0	53.0	42.8	45.8	29.4
Foreign invested sector	27.0	47.0	57.2	54.2	70.6

Source: General Statistics Organization of Vietnam, 2017.

Further, studies show that foreign firms have a stronger tendency to hire female employees than domestically owned firms, or they provide better opportunities for paid employment (see, Villarreal and Yu, 2007 – for the case of Mexico; Braunstein and Brenner, 2007 – for China; and Kodama, 2018 – for Japan). While we did not find any direct evidence for Vietnam, it is not unreasonable to expect similar trends.[5]

In Vietnam, one of the largest contributors to exports and a main source of female employment is textiles and clothing, is strongly influenced by the MFA, which was introduced in 1974 to control the exports of textiles and ready-made garments from developing countries to the EU and the US. To protect their domestic industry, developed countries regulated trade policy by imposing quotas or other technical regulations on imports of yarn, textiles, and apparel from developing countries (Robertson and Lopez-Acevedo, 2012). This mechanism varied significantly in bilateral negotiation between importers and suppliers (see, Chaudhary, 2011). The MFA is seen as an instrument that broke perfect competition in the world market for textiles and ready-made garments (Sharma and Prashant, 2009). It is seen as hampering production capacity of textile and garment-rich countries, namely, Korea, China, and India, and discouraging production in less-developing countries like Bangladesh. In their study of the impact of the MFA on Eastern European countries' exports, Erzan and Holmes (1992) note that once the MFA was relaxed, exports of labour intensive goods in these countries would more than proportionately increase and the degree of specialization could be substantially improved.

To gradually eliminate the barrier in international trade for fiber manufactured products, an Agreement on Textiles and Clothing (ATC) was made during the Uruguay Round for the purpose of phasing out the MFA over the ten-year period from 1995 (see, Chaudhary, 2011; Goto et al., 2011). Indeed, by the end of 2004, the MFA's successor, the Agreement on Textiles and Clothing (ATC)[6] had provided a decade of transition, from 1995, securing the integration of trade in textile and clothing into GATT (General Agreement on Tariffs and Trade) regulation.

The MFA and WTO arrangements impacted exports of apparel and clothing from Vietnam in different ways. Table 5 captures Vietnam's total exports and share of exports of apparel and clothing to its top ten trading partners. In the MFA and transition period (up to the end of 2004) apparel and clothing exports only began to receive a significant boost in the 1993-2004 period (also see Figure 1, panel 2). Until the collapse of the USSR in 1991, Vietnam had a firm basis of trade (including textiles and garments) with Soviet Bloc members (Goto et al., 2011), but then needed to look for new export markets.

During the period 1993-2004, Vietnam's bilateral trade agreement with the European Union of 1992 had allowed increased access to the EU market, with preferential quotas on garment exports (see, Goto et al., 2011; Nadvi et al., 2004). Further, the 19-year long US trade embargo to Vietnam was lifted in 1994. By 2000, Vietnam had signed a trade agreement with the US, allowing better access to the US market through a fall in tariffs on Vietnamese exports to the US from

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[5] See footnote 2.
[6] See https://unctad.org/en/Docs/edmmisc232add21_en.pdf

35% to only 5% (Abbott and Tarp, 2012; Nadvi et al., 2004). At about the same time Vietnam had access to the Japanese market for its garment exports as a most favored nation (MFN), with an agreement signed in 1999.[7]

Table 5.
The Top Ten Trading Partners of Vietnam with Respect to Bilateral Exports, by Selected Periods (1986-2011), Sector 'Articles of Apparel and Clothing, SITC, Rev.2

Partners	1986-1992		Partners	1993-2004		Partners	2005-2011	
	Value ($US Mil.)	Shares (%)		Value ($US Mil.)	Shares (%)		Value ($US Mil.)	Share (%)
Germany	261.70	38.55	US	6,558.75	34.19	US	35,126.76	61.45
Japan	142.15	20.94	Japan	5,358.29	27.93	Japan	6,941.57	12.14
Fmr DR Germany	98.13	14.45	Germany	3,060.59	15.95	Germany	3,900.28	6.82
France	38.36	5.65	France	1,224.16	6.38	United Kingdom	2,368.26	4.14
Germany	36.76	5.41	United Kingdom	728.93	3.80	France	2,039.21	3.57
Poland	34.27	5.05	Netherlands	611.61	3.19	Spain	1,922.18	3.36
Hungary	24.18	3.56	Spain	519.12	2.71	South Korea	1,750.80	3.06
Czechoslovakia	22.24	3.28	South Korea	413.43	2.16	Canada	1,525.59	2.67
Canada	10.84	1.60	Italy	399.77	2.08	Belgium	796.47	1.39
Sweden	10.26	1.51	Canada	308.88	1.61	Italy	790.85	1.38

Source: United Nations Trade Statistics, 2011

The MFA and preferential quota system with the EU were abolished fully by 2005 with the onset of Vietnam's membership with the WTO. As can be discerned from Figure 1, panel 2, the value of exports extraordinarily improved during the WTO (non-MFA) period, compared to the MFA period. Membership of the WTO (the non-MFA period) has been attributed with a surge of textiles and garments exports from Vietnam to the world market since 2007, during which period the largest importers of Vietnam's garments switched from the EU and Japan to the US market (see, Goto et al., 2011). In terms of the top ten trading partners of apparel and clothing displayed in Table 5, during the period 1993-2004 (in the MFA period) the share of total exports of apparel and clothing was highest for the US at around 34%; Japan (28%); and the EU (30%). Over the period 2005-2011 (in the WTO period), the US accounted for more than 60% of Vietnamese exports of apparel and clothing while exports to Japan and the EU were close to 12% and 16% respectively.

Female labour force participation, defined as the proportion of the female population aged 15-64 that is economically active, has averaged 80% over the

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[7]   Vietnam's exports of textile and clothing were not fully regulated by the MFA. For instance, exports to Japan, a non-quota market, were outside the purview of the MFA (Nadvi et al., 2003; Nadvi et al., 2004).

period 1990-2014 (Tables 6 and 7). In the 1990s, average female labour force participation was slightly higher at 81% but this fell in the 2000-2014 period to 79% (see Table 7). We note that there were slight changes in the average female labour force participation during the WTO (non-MFA) and non-WTO (MFA) periods.

The average female labour force participation was higher in the MFA (1990-2004) versus non-MFA (2005-2014) period (see Table 7). In the MFA (non-WTO) period, average female labour force participation was 80% compared to 78% in the non-MFA (WTO) period.

Our empirical tests below further investigate the relationship between female labour force participation and MFA and WTO, after controlling for other factors, including exports.

III. LITERATURE REVIEW

The theoretical time allocation models of Mincer (1962) and Becker (1965) are primarily used to explain female labour force participation. Becker's (1965) theory posits that women not only arbitrate between leisure and labour, but also between leisure, labour and home production of goods and services, which includes caring for their children. Home production is seen as the key factor influencing female participation in the labour force. Women will supply labour as long as the fruits of their labour are greater than the lost home production and leisure. Hence women with children may disengage from the labour force temporarily or permanently.

Consistent with the outcomes of the time allocation theory, studies have explored factors that encourage (or discourage) women's supply of labour. We explain the literature surrounding the Female Labour Force Participation (FLFP) determinants covered in the study.

A. Fertility

The link between fertility and FLFP is one of the most intensively studied relationships in this area. As noted in the literature, at some point in their lifetime women may spend time away from work to have children, often taking primary responsibility for their upbringing. Therefore, standard labour theory suggests that this reduced workforce participation is related to female fertility, although as noted in the previous sections, various authors show contradictory results.

Several studies found support for a negative relationship between fertility and FLFP in OECD nations (see Engelhardt and Prskawetz, 2004; Evan and Vozárová, 2018; and Adserà, 2004; Evans and Kelley, 2008; and Bailey, 2006) A few study provide global evidence on the matter (see Tsani et al., 2013; Bloom et al., 2009). In contrast, other such as Kinoshita and Guo (2015) for Japan and Da-Rocha and Fuster (2006) for some OECD nations, show that fertility has a positive effect on FLFP. Da-Rocha and Fuster (2006) investigated the role of labour market friction and the timing of births in explaining this positive relationship between fertility and FLFP. The authors found unemployment forces females to postpone and space births, which reduces the fertility rate.

A number of studies note a two-way relationship between FLFP and fertility. Cramer's 1980 study is one of the earliest to test and find the inverse relationship

between fertility and FLFP. Siah and Lee (2015) explained that women having children may be discouraged from participating in the labour market by a shortage of work-family support but on the other hand, stay in the workforce because of the costs associated with bearing and raising a child. While higher fertility is likely to exert a negative impact on FLFP, having children may prompt women to find paid work to meet the needs of their family (Siah and Lee, 2015). This reciprocal relationship is also supported by Cheng (1996a) for African American women's labour force participation. On the contrary, Cheng (1996b) and Cheng et al. (1997) found uni-directional causality running from fertility to FLFP in the US and Japan.

McNown and Ridao-Cano (2005) noted that the relationship between fertility and FLFP may also be affected by age. In their study of UK females, McNown and Ridao-Cano (2005) divided data on fertility and FLFP into age-specific groups to study the relationship between FLFP, fertility and female and male wages. They confirmed a uni-directional causality from fertility to FLFP in the long-run for women aged 25-34. However, this link is not present in the case of women aged 20-24. Narayan and Smyth (2006) found one-way Granger causality from fertility rate to workforce participation for Australian women. Mishra et al. (2010) confirmed this uni-directional causality from fertility to FLFP for G7 countries. In an extended study of high-income countries, Mishra and Smyth (2010) applied the Granger causality test for 28 OECD countries and found a bi-directional causality between fertility and labour force participation for women aged 15-64. Their study also found that for a subset of the group, specifically females aged 15-34, there is only a one-way causality, running from FLFP to fertility. In the US, Salamaliki et al. (2013) found evidence in support of a bi-directional causality between fertility and FLFP for two groups of women, those aged between 25-34 and above 16. Cheng (1999) tested for a bi-directional link between fertility and FLFP in Taiwan but failed to find any significant connection between the two variables.

B. Health Status and Education
Women in good health and with a better education background (or higher level of schooling) may have a better chance of participating in the labour market. Iregui et al. (2016) found a strong link between FLFP and health status in Colombia. They noted that outcomes relating to FLFP may vary because of age. Young females with better health and education are more likely to have a job than women with a child under five, or who are married. Similarly, Cameron, et al. (2001) noted the important role played by culture in determining the link between education and FLFP in a country.[8]

In terms of causation, Iregui et al. (2016), found bi-directional causation between health conditions of workers and workforce participation for urban low- and middle-income individuals in Colombia. Narayan and Smyth (2006) found one-way Granger causality from mortality rate to FLFP in Australia. Similarly, Cai (2010) found a bi-directional relationship between health (measured based on self-reported health status) and FLFP in Australia.

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[8] While female labour force participation may be sensitive to the age of female workers, number of children, or marital status, as mentioned in the previous section, consistent data on these variables for Vietnam were not found for our study.

C. Government Policy on Education

Some authors have examined the role of government policy around education and training in boosting workforce participation. Generally, family decisions on schooling, or continuing schooling, in low-income countries such as Vietnam, have been biased towards boys (Liu, 2000, 2004). In these countries, cultural expectations that sons will support their elderly parents lead to higher anticipated returns on boys' education, and investment in education, than on girls'. Himaz (2009) found a bias in India towards boys in terms of school enrolments, as well as extra tuition fees, among children aged 10-14 and 15-19. Liu (2000) and Liu (2004) found supporting evidence of this gender discrimination in education expenditure in Vietnam. In its latest report, the Institute for Social Development Studies (ISDS, 2015) confirms that parents aged over 40, as well as poor parents, are more likely to sacrifice their daughter's education in favor of their son's. Additional support from the government, therefore, can be an impetus for female education in a developing nation, such as Vietnam.

Caliendo and Schmidl (2016) examined the implications in European countries of active labour market programs, including government funded schemes such as public work programs and job search assistance and monitoring. With respect to government programs, the authors found that job search assistance and monitoring had a positive long-run influence on labour market participation because these schemes helped young people to find jobs faster and fostered higher quality employment for youths. The study also noted that public sector work programs are frequently funded by governments to create temporary employment opportunities for young people.

Several other studies found that government expenditure (which includes public transfer, sectoral subsidies, and job training or schooling funded schemes) has a positive linkage with FLFP (Cameron et al., 2001; Cavalcanti and Tavares, 2011; Kanjilal-Bhaduri and Pastore, 2018). Schultz (2002) found that female labour force participation in OECD countries responded more positively to education (or more schooling) than male workforce participation. Moreover, the study found that female labour force participation had a causal effect on the government budget, since more women (with a higher level of schooling) are entering the labour market, broadening the tax base.

D. Economic Growth

In theory, improvement in the standard of living promotes higher education, improved health conditions, better training and support systems for working women, and the substitution of labour with technology for household chores, all of which should improve female labour force participation. Several studies show evidence of a positive relationship between economic growth and FLFP (Grabowski and Self, 2014; Tsani et al., 2013). Mujahid and Uz Zafar (2012) found, in Pakistan, the case of uni-directional causality running from economic growth to female labour force participation in both the long run and short run.

However, it has also been found that economic growth can discourage female labour force participation, and vice versa. Steel (1981) attributed the rise in female labour force participation in Ghana during the 1960s to its sluggish economy,

which brought per capita income to a standstill and, at times, lower levels (1964-1967). Steel noted that lower per capita income, together with falling wages, forced women to find a job in order to maintain their family income. Goldin (1994) posited that female labour force participation varies with the stages of a country's economic development. During the initial stages of development, women spend their time on household chores and working on the family farm. As the domestic economy improves, increases in family income encourage working women to take on more household responsibilities and reduce their activities in the labour market. The contraction of sectors that traditionally employ women may provide a push factor at this stage of development. Later stages of development bring increased opportunities that compel female labour force participation to rise. Goldin (1995) validated the U-shaped hypothesis using data from 180 countries and found that while the poorest nations were at the falling section of the U-shape, their middle-income and high-income counterparts were at the bottom and rising portion, respectively. The existence of this U-shape relationship between income and female labour force participation is also confirmed by studies such as Mammen and Paxson (2000) and Tsani et al. (2013). Given that Vietnam is in the process of transforming from a low-income to a lower middle-income country, it can be expected to be in the the falling part of the U-shape, which is confirmed by Sanjukta (2010).

E. Economic Integration: Trade/Trade Liberalization
The effect of trade/trade liberalization on net job growth, which accounts for job creation and job destruction, has been examined in depth by some studies.[9] In the literature, trade liberalization is seen as not only increasing the number of jobs created in the economy, but also causing job destruction. Exporting companies may enjoy greater access to larger and international markets, resulting in higher profits and more jobs created; but when confronted with fierce competition from international businesses, domestic firms may be forced to cut back on their production or leave the market (Ranjan, 2012). It is, therefore, unclear whether trade liberalization will exert positive or negative effects on the labour market. Empirical evidence seems to confirm this. For India, Hasan et al. (2012) found evidence of a negative relationship between unemployment and lowered tariffs in the short-run but a positive linkage in the long-run. By examining firm-level data on employment in China's Annual Surveys of Industrial Enterprises, Ma et al. (2015) asserted that the openness to, and integration with, the world economy helped drive China's job creation and resulted in net job growth. Ma et al. (2015) also showed that industries or sectors more exposed to openness are likely to enjoy more job creation and less job destruction.

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[9] In their study, Mortensen and Pissarides (1994) define job creation as when a firm is trying to fill a vacancy to begin a production process, and job destruction as when a person leaves a position and the market. While this data provides more detailed information around labour market entry and exit, it is unavailable by gender for Vietnam, hence we do not cover this aspect of the labour market but briefly explain the key findings of the net job growth literature with respect to economic integration.

Rashid and Akram (2017) examined the impact of international trade competitiveness on the UK manufacturing sector, focusing on both trade liberalization and the exchange rate. Exchange rate is an indirect channel through which trade may have an impact on a firm's performance and employment decisions (also see Dogan et al., 2018). The authors found that contributions to job creation and job destruction are dependent on the size of the firm. Small businesses are more likely to contribute more to job creation and less to job destruction than large corporates.

Gender-specific study of the impact of trade/trade liberalization on the workforce is currently thin, probably owing to a lack of consistent data. In her study of trade and gender, Korinek (2005) reported that trade creates jobs, particularly in export-oriented sectors. Sauré and Zoabi (2014) developed an elaborate theoretical model where they show that trade between a capital-poor and a capital-rich economy widens the gender gap in the capital-rich country, and under the equilibrium factor allocation, this decreases aggregate female labour force participation in the capital-rich country. Taking the case of the US and Mexico over the period 1990-2007, which also coincides with the NAFTA agreement between the two countries, the authors find support for their theory. Grabowski and Self (2014) examined the link between trade and female labour force participation for 171 countries divided into income groups for the period 2000-2010. The authors found that in low income countries trade increases female labour force participation in non-agricultural sectors.

IV. EMPIRICAL MODEL

In light of the literature and data availability, the basic Female Labour Force Participation (*FLFP*) model with traditional and trade related determinants takes the following form:

$$FLFP_t = \alpha + \beta_1 FLFP_{t-1} + \beta_2 \text{FLE}_t + \beta_3 \text{FEOUT}_t + \beta_4 \text{FERTI}_t + \beta_5 \text{DGDPP}_t + \beta_6 EDUEXP_t + \beta_7 \ TRADE_{ij,t} + \beta_8 MFA_t + \beta_9 WTO_t + \epsilon_t \tag{1}$$

Here, all variables, except *MFA* and *WTO*, are in logarithmic form. The dependent variable is *FLFP* of Vietnam; α and the βs are the parameters to be estimated; and ϵ_t captures the residuals of the model. The one-period lag of *FLFP* accounts for omitted variables and possible endogeneity issue. The key independent variables of interest are the bilateral trade (*TRADE*) of Vietnam, country *i*, with its 54 trade partners, countries *j*, and *WTO* and *MFA* which are binary variables that take the value of 1 between 1986-2004 and 2007-2014, respectively, and zero, otherwise.

The traditional determinants of *FLFP* are as follows. Health of the female labour force is measured with Female Life Expectancy at birth (*FLE*). *FLE* is the average number of years a newborn is expected to live if mortality patterns at the time of its birth remains constant. Education opportunity is captured as female

adolescents out of secondary school as a percentage of females of lower secondary school age (*FEOUT*).[10] Fertility rate (*FERTI*) is births per woman.

We capture the direct government policy impact on *FLFP* through government expenditure on education as a percentage of total government expenditure (*EDUEXP*), which is the only available variable with consistent data for Vietnam. The level of development or standard of living is depicted using GDP per capita (*DGDPP*).

To capture the dynamics of bilateral trade relations between Vietnam and each of her trading partners and at the same time provide average coefficients, we run Equation (1) under a panel construct. Here, the variations in the cross sections identify with Vietnam's trade with trading partners captured in bilateral export data ($Trade_{ij}$). On the basis of these trading partners, four panels are developed for estimating equation (1): the full sample; and three income groups. The full sample panel captures Vietnam's exports to all top 54 trading partners (*j*s). Consistent with Narayan and Nguyen (2016), the income-based panels cover Vietnam's bilateral trade from high-income trading partners (SMHI); the upper middle-income countries (SMUMI); and the low and lower middle-income countries (SMLMI). In this set-up, bilateral exports ($Trade_{ij}$) vary by cross section (or trading partner). All other determinants of *FLFP* only relate to Vietnam, and are, therefore, repeated for each cross section (*i*) in the panel. In the full sample, there are 54 cross sections, while income groups, SMHI, SMUMI, and SMLMI, comprise of 30, 16, and 9 cross sections, respectively.[11]

Finally, equation (1) captures contemporaneous (zero lag) effects of the determinants (of *FLFP*) within a year. To allow for the possibility of lagged effects (or the lingering effects of determinants of FLFP in the following year), equation (1) is re-estimated with one-period lag of the determinants mentioned above. Given the small sample period and the large number of determinants of *FLFP*, only one-year lag could be allowed in the estimations.

V. DATA AND PRELIMINARY ANALYSIS
A. Data

This study covers annual data over the period 1999-2014.[12] Our data on the bilateral exports of Vietnam to 54 trade partners (*TRADE*) are sourced from the international Monetary Fund's eLibrary, while all data relating to the Female Labour Force Participation of Vietnam (*FLFP*) and its traditional determinants are sourced from the World Bank's online database. The definitions and sources of the variables are clarified in Table 6. It should be noted that our choice of traditional determinants of *FLFP* was dictated by the literature and by the availability of consistent data for Vietnam.

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[10] Education is captured in the literature with schooling data such as: the percentage of female labour force completing at least primary education; and female labour force with secondary education, (% of female labour force). Consistent time series schooling data are not available for Vietnam.

[11] Further information on trading partners are provided in Table 8.

[12] *EDUEXP* and *FOUT* come with limited historical data, starting from 1998 and 1999 respectively. Hence, we re-estimated the models excluding these two variables, which gave us a bigger sample (1990-2015). These results are available on request. The empirical findings reported below are robust across both samples.

Table 6.
Data and Sources

Variables	Definition	Source
FLFP	Female Labour Force Participation rate: Labour force participation ratio is the proportion of the population aged 15-64 that is economically active: all people who supply labour for the production of goods and services during a specified period. This series is modelled on ILO estimates.	The World Bank Database http://data.worldbank.org/ indicator/SL.TLF.ACTI. FE.ZS retrieved on September 28, 2016. Note that the WB discontinued this series after that date.
FLE	Female Life Expectancy at birth: Life expectancy at birth indicates the number of years a newborn infant would live if prevailing patterns of mortality at the time of its birth were to stay the same throughout its life.	The World Bank Database http://data.worldbank.org/ indicator/SP.DYN.LE00.FE.IN
FERTI	Female fertility rate: Total fertility rate represents the number of children that would be born to a woman if she were to live to the end of her childbearing years and bear children in accordance with age-specific fertility rates of the specified year.	The World Bank Database http://data.worldbank.org/ indicator/SP.DYN.TFRT.IN
FOUT	Females out of secondary school: Female adolescents out of school as a ratio of lower secondary school aged adolescents	The World Bank Database http://data.worldbank.org/ indicator/SE.SEC.UNER. LO.FE.ZS
EDUEXP	Expenditure on education as a ratio of total government expenditure: Total general (local, regional and central) government expenditure on education (current, capital, and transfers), expressed as a percentage of total general government expenditure on all sectors (including health, education, social services, etc.).	The World Bank Database http://data.worldbank.org/ indicator/SE.XPD.TOTL.GB.ZS
GDPP	GDP per capita: GDP per capita is gross domestic product divided by midyear population. Data are in constant 2010 US dollars.	The World Bank Database http://data.worldbank.org/ indicator/NY.GDP.PCAP.KD
TRADE	Bilateral exports	IMF elibrary: Direction of trade

B. Preliminary Analysis

Some standard descriptive statistics on the *FLFP* for Vietnam and the traditional drivers of *FLFP* are provided in Table 7 (also see Figure 1, panel 3). Strong changes in the variables can be seen over time. *FLFP* was stronger during the 1990s (81%) than in the period 2000-2014 (79%) (Table 7). Incidentally, government spending on education as a ratio of GDP, fertility rate, and female adolescents out of school as a percentage of females of lower secondary school age were also stronger in the 1990s than in the period 2000-2014. In contrast, female life expectancy at birth and the standard of living were stronger in the 2000-2014 period compared to the 1990s.

Table 7.
Vietnam's Female Labour Force Participation (FLFP) and its Determinants: 1990-2014

This table presents mean values of our dependent variable FLFP (*FLFP*) of Vietnam, country *i,* and the independent variables relating to Vietnam: health of the female labour force, measured with female life expectancy at birth (*FLE*); education measured by female adolescents out of school as a ratio of female at lower secondary school age (*FOUT*); direct government policy impact on *FLFP* is captured through using government expenditure on education as a ratio of total government expenditure (*EDUEXP*); fertility rate, total (births per woman) (*FERTI*); and GDP per capita (current US$) (*GDPP*) is used to capture level of development or standard of living.

Mean	FLFP	EDUEXP	FERTI	FLE	FOUT	GDPP
1990-2014	0.795	0.141	0.025	0.777	0.219	688.128
1990-1999	0.81	0.145	0.028	0.765	0.284	252.576
2000-2009	0.79	0.141	0.019	0.791	0.222	730.945
2010-2014	0.79	0.140	0.020	0.803	0.179	1718.137
MFA (1990-2004)	0.80	0.142	0.025	0.772	0.257	334.857
Non-MFA (2005-2014)	0.78	0.140	0.019	0.799	0.190	1340.305
WTO (2007-2014)	0.78	0.141	0.019	0.801	0.185	1488.360
Non-WTO (1990-2006)	0.80	0.142	0.024	0.775	0.246	383.472

Source: World Bank Database; Authors' calculations

Government spending on education (*EDUEXP*) averaged 14.5% of GDP in the 1990s, falling by half a percentage point over the period 2000-2014. Fertility rate, measured as births per woman, fell from 2.8 in the 1990s to 1.9 in the period 2000-2009, only to increase by a percentage point to 2% in the period 2010-2014. Similarly, female adolescents out of school as a percentage of females of lower secondary school age was at 28% in the 1990s, falling to 22% in the period 2000-2009, and falling further, to 18%, in the period 2010-2014. GDP per capita (and female life expectancy) rose from an average of US$252.58 (77 years) in the 1990s to US$730.95 (79 years) in 2000-2009 and rose further to $US1717.14 (80 years) in the period 2000-2014.

Table 8.
Common Statistics on Bilateral Exports by Trading Partner Income Group

This table presents the common statistics on trade measured as bilateral exports of goods between Vietnam, country (*i*) and countries *j* (*TRADE*). Countries *j* make up the top 54 trading partners of Vietnam. We group them by income: high income (SMHI); upper middle income (SMUMI); and low and lower middle income (SMLMI) groups. A total of 30 nations belonging to SMHI are: Australia, Austria, Belgium, Canada, Hong Kong, the Czech Republic, Denmark, Finland, France, Germany, Greece, Hungary, Ireland, Israel, Italy, Japan, South Korea, the Netherlands, New Zealand, Norway, Poland, Portugal, Saudi Arabia, Singapore, Spain, Sweden, Switzerland, United Arab Emirates, United Kingdom, United States; the 16 countries belonging to SMUMI are: Algeria, Argentina, Brazil, Bulgaria, Chile, China (Mainland), Cuba, Iran, Malaysia, Mexico, Panama, Romania, Russian Federation, South Africa, Thailand, Turkey; and the nine countries classified as SMLMI are: Cambodia, Egypt, India, Indonesia, Lao People's Democratic Republic, Nigeria, Pakistan, the Philippines, and Vietnam.

	Full sample		SMHI		SMUMI		SMLMI	
	Exports (US$)	Export share (%)	Exports (US$)	Export share (%)	Exports (US$)	Export share (%)	Exports (US$)	Export share (%)
Mean	2,188,478	1.852	2,972,696	2.555	1,293,605	1.035	1,037,405	0.847
Median	2,411,762	0.292	475,875.5	0.384	190090.2	0.002	4.3,749.7	0.003
Maximum	2,607,782	42.300	49,802,456	42.300	19,327,702	13.725	6,205,210	4.787
Std. Dev.	534,059	0.042	6,082,269	0.052	284,7420	0.022	1,296,529	0.010
Observations	1620	1620	900	900	480	480	240	240

   Some basic statistics on the exports and export share by trading partner income group are provided in Table 8. Vietnamese exports flowing to high-income trading partners (SMHI) are, on average, strongest. This is followed by upper middle-income (SMUMI) and low and lower middle-income (SMLMI) trading partners.[13]

C. Unit Root Test

As part of our preliminary analysis, we conducted tests to examine the stationarity of the variables. Given that equation (1) is examined as a panel construct, panel unit root (or non-stationarity) tests, namely Im, Pesaran, Shin, IPS, (IPS, 2003); Levin, Lau, Chu, (LLC, 2002); and the Fisher test – Augmented Dickey Fuller (ADF) – Maddala and Wu (1999) are applied. These tests have the common null hypothesis of a unit root (non-stationarity) and are conducted with an intercept and a trend.[14] For all variables, except GDP per capita (*GDPP*), the tests reject the null. GDP per capita becomes stationary in first difference form, that is, in growth form (*DGDPP*). As a result, *GDPP* appears in our empirical model in first differenced form while the rest appear in level form. These results are available on request.

C. Granger Causality

In light of the literature, we conducted pair-wise Granger causality tests to examine whether each of the factors identified above Granger cause *FLFP* in Vietnam, and vice versa. Variables enter the Granger causality test in stationary form. Equations (2) and (3) are estimated with autoregressive lag lengths 1-4:

$$FLFP_t = \delta_{1t} + \sum_{n=1}^{4} \emptyset_1 FLFP_{t-n} + \sum_{n=1}^{4} \emptyset_3 X_{t-n} + \varepsilon_{i,t} \tag{2}$$

$$X_t = \delta_{2t} + \sum_{n=1}^{4} \emptyset_1 X_{t-n} + \sum_{n=1}^{4} \emptyset_3 FLFP_{t-n} + \varepsilon_t \tag{3}$$

   Here, the dependent variable is female labour force participation of Vietnam (*FLFP*); δ_t, and φ_t are parameters to be estimated; ε_t is the error term; and X is a determinant of *FLFP*, namely, *EDUEXP, FERTI, FLE, FOUT, or GDPP.* Since *EDUEXP, FERTI*, *FLE, FOUT*, and *GDPP* relate to Vietnam only, Granger causality tests, as described in equations (1) and (2), are carried out. Recall that *TRADE* data comprises 54 bilateral export data series (for exports flowing from Vietnam to each of the 54 trading partners). Hence, the causality test between *FLFP* and *TRADE* was carried out after modifying equations (1) and (2) to suit panel estimation. All variables are expressed in logarithmic form.

   The results associated with models with lag length 1-4 indicate a strong case of bi-directional causality between *FLFP* and all its determinants listed above. Consistent with some evidence in the literature, our results suggest that in Vietnam there is a two-way relationship between *FLFP* and fertility, education, health, and income growth (see Section III). Exports (*TRADE*) is found to Granger cause

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[13] For statistical analyses, and discussion of trends and patterns in regard to Vietnam's exports of goods with these 54 trading partners see, Narayan and Nguyen (2016).

[14] For an explanation of the panel unit root tests, refer to Narayan and Nguyen (2019).

FLPF. At the same time, availability of a relatively low-cost female labour force in Vietnam, which is one of the pull factors for FDI in export industries, Granger causes exports (see discussion in Section II). These results are available on request.

VI. EMPIRICAL RESULTS

Four versions of equation (1) were estimated using the panel OLS method. Models (1) and (2) include depict contemporaneous effects between *FLFP* and the regressors while models (3) and (4) capture the one-year lagged effects. The economic integration variables are excluded in models (1) and (4) and included in (2) and (3) to help evaluate the importance (or not) of the economic integration variables. Table 9 presents estimated parameters for models (1-4) for the full sample while Table 10 presents the results for models (2-3) estimated for the trading partner groups.[15]

Our key results are as follows. First, models (2-3) with the economic integration variables show stronger adjusted R-squared, suggesting that economic integration has influenced *FLFP* in Vietnam. This result is true for the full sample (Table 9) and for the three income panels covered in the study (Table 10).

Higher exports were responsible for significantly encouraging *FLFP* in the case of all panels studied (Tables 9 and 10). Both contemporaneous and one-year lagged effect is noticed, suggesting that an increase in export-related activities improves *FLFP* within the year and the following year, with the effect being lower in the second year. Full sample results indicate that an increase in exports of goods from Vietnam to all 54 countries by 10% increases *FLFP* by 0.09% in the same year and 0.05% in the following year (Table 9). Table 10 suggests that activities relating to exports with high-income countries enable stronger increases in *FLFP* in Vietnam than those relating to exports to other trade partners. A 10% increase in Vietnamese exports flowing to trading partners of high income, upper middle income, and low and lower middle income increased *FLFP* by 0.05%, 0.04%, and 0.03% in the same year (Table 10). If we consider the implication of the lagged effect of exports by trading partners (model 3, Table 10), we find that exports flowing to high-income countries show an insignificant effect on *FLFP* in the second year while upper middle-income countries increase *FLFP* with the same vigor as in the first year. With respect to Vietnam's export trade with low and lower middle-income countries, our models could not capture their lagged effects on *FLFP*.

Like exports, *MFA* encouraged *FLFP*, which was higher in *MFA* period (1989-2004) compared to the non-MFA period (2007-2014) (Table 9, models (2-3)). However, *WTO* is found to have a negative effect on *FLFP*, such that *FLFP* fell during the *WTO* period (2007-2014), i.e. since Vietnam became a member of the WTO in 2007 (Table 9).[16] The *MFA* and *WTO* outcomes align for the full sample and trade partner-based panels.

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[15] All determinants of Vietnam's *FLFP* in models (1) and (4) relate to Vietnam only, these two models produced the same results for the full sample of trading partners and for the trading partner groups by their incomes. For brevity, we present results for models (1) and (4) in Table 9 only.

[16] We note that the size, not sign, effect of the *MFA* and the *WTO* on *FLFP* is sensitive to the inclusion of bilateral exports as a determinant of *FLFP*. The results are available on request. This exercise implied that the best fit model is one that covers all three variables that depict economic integration in Vietnam.

Table 9.

Determinants of Female Labour Force Participation (FLFP): 1999-2015 (Full Sample)

This table presents panel OLS results relating equation (1). Models (1) and (4) exclude economic integration variables (*TRADE, MFA* and *WTO*) while models (2) and (3) include these variables. Further models (1) and (2) cover contemporaneous effects and models (3) and (4) cover one-period lagged effects. The estimations cover the sample period 1999-2015. Our dependent variable is female labour force participation (*FLFP*) of Vietnam. The explanatory variables are health of the female labour force in Vietnam, measured with female life expectancy at birth (*FLE*); education and skills of the female labour force in Vietnam, measured as female adolescents out of school (as a ratio of female in lower secondary school age) (*FEOUT*); government expenditure on education as a ratio of total government expenditure in Vietnam (*EDUEXP*); fertility rate in Vietnam, total (births per woman) (*FERTI*); and GDP per capita of Vietnam (current US$) (*GDPP*) captures level of development or standard of living. D denotes the first difference of the variable. Of key interest are the newly introduced independent variables: exports between Vietnam, country *i* and trading partner countries *js* (*TRADE*); the Multi Fiber Agreement (*MFA*); and membership of the *WTO*. *MFA* and *WTO* are binary variables that take the value of 1 between 1986-2004 and 2007-2014. The *P-values* are in italics.

	(1)		(2)			(3)		(4)	
Variable	**Coef.**	**Prob.**	**Coef.**	**Prob.**	**Variable**	**Coef.**	**Prob.**	**Coef.**	**Prob.**
C	0.627	0.000	0.015	0.768	C	0.168	0.000	0.510	0.000
FLFP (-1)	1.438	0.000	0.991	0.000	FLFP (-1)	0.853	0.000	1.184	0.000
FERTI	0.071	0.000	0.036	0.000	FERTI (-1)	0.046	0.000	0.047	0.000
FOUT	0.017	0.000	0.019	0.000	FOUT (-1)	0.023	0.000	0.035	0.000
DGDPP	-0.010	0.000	-0.016	0.000	DGDPP (-1)	-0.001	0.362	0.008	0.000
FLE	0.910	0.000	0.054	0.453	FLE (-1)	0.473	0.000	0.961	0.000
EDUEXP	0.003	0.031	0.005	0.000	EDUEXP (-1)	-0.015	0.000	0.002	0.097
TRADE			0.009	0.000	TRADE (-1)	0.005	0.000		
MFA			0.003	0.000	MFA	0.005	0.000		
WTO			-0.002	0.000	WTO	-0.003	0.000		
$\bar{R}^2$	0.992		0.997		$\bar{R}^2$	0.998		0.986	
Obs.	756		756		Obs.	756		756	

Overall, our results suggest that economic integration via exports (that are produced in Vietnam mainly with the support of foreign investment) has improved *FLPF*. The *MFA* (non-WTO) period is seen as improving *FLFP* and the non-MFA (*WTO*) period is seen as reducing *FLFP*. Our findings, that economic integration can create and destroy jobs even for female workers, support existing evidence on the labour market. *WTO* can be seen as being part of the process of further deepening economic integration of Vietnam with other WTO members, and as predicted by studies including Goldin (1990, 1994), Mammen and Paxson (2000), Steel (1981), and Tsani et al. (2013), Vietnam has experienced a fall in female workers during the WTO period.

During the MFA period, Vietnam's labour intensive industries were heavily supported by trade agreements with the EU, and improved relations with the US, which benefited the female workforce. During the WTO period, while the strength of trade relations between the US and Vietnam saw new levels almost every year – except for the period tainted by the Global Financial Crisis (GFC) – our results suggest that female labour force participation has fallen. First, WTO was directly responsible for this. The preferential treatment that labour intensive industries had been enjoying in the MFA period were lost with Vietnam's WTO membership. Second, the share of technology intensive products and human capital intensive products to total exports had increased sharply during the period of 1997-2008,

while the share of agricultural resource intensive products and unskilled labour intensive products either decreased or were at a standstill (Nguyen, 2011).[17] This means that by the time Vietnam became an official member of the WTO, the nation had moved on to technology intensive manufacturing, as reported by Le (2010), which is a sector that is not a traditional employer of females. Third, in the technology intensive industries, men were preferred over women for technical, highly skilled and outdoor jobs (ILO, 2015). In a policy brief, the ILO (2015) reported that gender discrimination in job advertising is common in Vietnam. Reviewing job postings in the few months from November 2014 to January 2015, the ILO concluded that about 20% of job advertisements had gender requirements, and of these 70% required male workers. Fourth, many women, who are hired in technology intensive industries, particularly in the electronics industry, end up at the lowest-paid end of the assembly line and face poor work conditions regarding health and safety.[18]

So far in the discussion we have noted that exports and the MFA agreement positively influenced female labour force participation while WTO negatively affected female labour force participation. Next, we examine the influence of the traditional factors on female labour force participation. As the traditional factors relate specifically to Vietnam, models (1) and (4), which cover the traditional factors only, produced the same results for the full sample and income panels. To avoid replication, we presented the estimated results (relating to the traditional factors only) for models (1) and (4) in Table 9 only.

The key findings are as follows. First, the effect of economic integration variables has been lower in magnitude than all traditional determinants of female labour force participation, except government spending on education. Second, if we compare models (1) and (4), with (2) and (3) respectively, it becomes apparent that the inclusion of the economic integration variables intensified the influence on female labour force participation of some traditional factors, namely, female adolescents out of school (*FOUT*), standard of living (*GDPP*), and government spending on education (*EDUEXP*). At the same time, the economic integration variables reduced the impact on female labour force participation of other traditional factors, namely the fertility rate (*FERTI*), and female life expectancy (*FLE*). These changes are in terms of size effects, and not in terms of the sign or the significance of the effect (Table 10).[19] We discuss these differences in some depth next as we examine the findings by each traditional variable.[20]

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[17] This shift towards technology-intensive industry was strongly backed by the Vietnamese government as seen in the approval of the Decision No. 55/2007/QD-TTg, as documented in Nguyen et al., (2016). According to this decision, three technology-driven industries, including, mechanical engineering (including, shipbuilding and automobiles), electronic, telecommunications and information technology, and products from new technology were listed as spearhead industries. Alas, these industries were not compatible with female labour force participation.

[18] See Research Center for Gender, Family, Environment Development (CFGED) && International Persistent Organic Pollutants Elimination Network (IPEN), 2017.

[19] These comparisons with and out economic integration variables should be treated as preliminary findings. More detailed analysis, for example one that uses survey data, can further shed light on the findings discussed here.

[20] These results hold when the models are re-estimated with the economic variables, trade, MFA, and WTO examined separately with the contemporaneous and one-year lagged effects of the traditional variables and trade. These results are available on request.

Table 10
Determinants of Female Labour Force Participation (FLFP): 1999-2015 (by Trading Partner)

This table presents panel OLS results relating to models (2-3) by trading partners, grouped in terms of their income: high-income trading partners (SMHI); upper middle-income trading partners (SMUMI); and low-to-lower-middle-income trading partners (SMLMI). The estimations cover the sample period 1999-2015. Our dependent variable is female labour force participation (*FLFP*) of Vietnam, country *i*. Our dependent variable is female labour force participation (*FLFP*) of Vietnam, country *i*. This is determined by: health of the female labour force in Vietnam, measured with female life expectancy at birth (*FLE*); education and skills of the female labour force in Vietnam, measured as female adolescents out of school (as a ratio of female in lower secondary school age) (*FEOUT*); government expenditure on education as a ratio of total government expenditure in Vietnam (*EDUEXP*); fertility rate in Vietnam, total (births per woman) (*FERTI*); and GDP per capita of Vietnam (current US$) (*GDPP*) captures level of development or standard of living. D denotes the first difference of the variable. Of key interest are the newly introduced independent variables: exports between Vietnam, *i* and trading partner countries, *j*s (*TRADE*); the Multi Fiber Agreement (*MFA*); and membership of the *WTO*. *MFA* and *WTO* are binary variables that take the value of 1 between 1986-2004 and 2007-2014.

| Variable | Model (2) | | | | | | Model (3) | | | | | |
| | SMHI | | SMUMI | | SMLMI | | SMHI | | SMUMI | | SMLMI | |
	Coef.	Prob.	Coef.	Prob.	Coef.	Prob.	Coef.	Prob.	Coef.	Prob.	Coef.	Prob.
C	0.315	0.000	0.201	0.007	0.319	0.002	0.420	0.000	0.130	0.000	0.540	0.000
FLFP (-1)	1.090	0.000	1.049	0.000	1.133	0.000	0.932	0.000	0.845	0.000	1.101	0.000
FERTI (-1)	0.062	0.000	0.052	0.000	0.044	0.002	0.063	0.000	0.044	0.000	0.059	0.000
FOUT (-1)	0.021	0.000	0.006	0.030	0.022	0.000	0.022	0.000	0.013	0.000	0.034	0.000
DGDPP (-1)	-0.012	0.000	-0.012	0.000	-0.010	0.000	0.005	0.000	-0.001	0.525	0.008	0.000
FLE (-1)	0.498	0.000	0.158	0.244	0.619	0.000	0.839	0.000	0.278	0.000	0.969	0.000
EDUEXP (-1)	0.001	0.503	0.014	0.000	0.001	0.506	-0.016	0.000	-0.004	0.007	0.004	0.313
TRADE (-1)	0.005	0.000	0.004	0.000	0.003	0.004	0.000	0.633	0.004	0.000		
MFA	0.003	0.000	0.003	0.000	0.003	0.000	0.004	0.000	0.004	0.000		
WTO	-0.002	0.000	-0.002	0.000	-0.002	0.000	-0.003	0.000	-0.003	0.000	-0.002	0.000
$\bar{R}^2$	0.997		0.997		0.997		0.998		0.999		0.988	
Obs.	420		224		112		420		224		112	

First, in contrast to general female labour force participation theory, we find that a lower fertility rate discouraged *FLFP*. A 1% decrease in *FERTI* is found to reduce *FLFP* by more than 0.07% (and 0.04%), in the same year without (and with) economic integration variables, and vice versa (Table 9). Models 3 and 4 show one-year lag effects of close to 0.05% with or without exports. Recent studies also tend to find a positive relationship between fertility rate and female labour force participation (see, Kinoshita and Guo (2015) in the case of Japan; and Da-Rocha and Fuster (2006) in the case of OECD nations). Da-Rocha and Fuster (2006) gave importance to labour market frictions to explain the positive association between fertility rate and female labour force participation in OECD countries. The authors argued that faced with job insecurity, specifically, unemployment, females postpone and space births, which reduces the fertility rate, bringing about a situation where lower fertility rate is associated with the lower female labour force participation in OECD countries. In Vietnam, similar conditions (i.e. lower fertility and female labour force participation) may have been triggered by events including the declining role of females in the agriculture sector (Table 1), the ending of MFA, and the shift from labour intensive to high-tech manufacturing.

The association between fertility rate and female labour force participation only slightly weakened once the economic integration variables were introduced. This is probably partially related to the previous discussion, that women working in emerging industries, such as electronics, are mainly in low paying jobs and are likely to be working long hours and in poor working conditions. As a result, the weakness in the positive relationship between *FLFP* and *FERTI* suggests that while women may have found employment in the export industries, they continued to postpone and space births. Nonetheless, notice that the (positive) influence of fertility on female labour force participation is strongest when this association is conditioned to exports flowing to high-income trading partners (*FLFP* falls by 0.06% after a 1% decrease in *FERTI*) and lowest when conditioned to exports to low and lower middle-income countries (*FLFP* falls by 0.04% after a 1% decrease in *FERTI*) (model 2, Table 10). Model (3), which captures only the one-year lagged effects, shows similar findings (Table 10). This probably implies that women working in industries that export to high income trading partners are least likely to be postponing fertility decisions.

Second, female adolescents out of school as a percentage of females of lower secondary school age (*FEOUT*) increases *FLFP*, with a 10% increase in young women out of secondary school increasing *FLFP* by 0.17% and 0.19% in the same year, before and after incorporating economic integration variables. The impact increased to 0.2% in the same year when we consider trade with high-income and low to lower middle-income countries (Table 10). For the same groups, the one-year lag impact of a 10% increase in *FEOUT* on *FLFP* is 0.2% and 0.3%, respectively. Overall. these results indicate that economic integration of Vietnam helped increase the chance of employment – in low skill and low paid jobs – for female adolescents leaving school early.

Third, higher female life expectancy (at birth), which is our measure of health status of the female labour force, led to significant contemporaneous and one-period lagged effects on FLFP. Women's health (*FLE*) is found to be the strongest determinant of *FLFP* in Vietnam. Excluding (including) the economic integration

variables, a 10% improvement in *FLE* led to a 9% (0.5%) increase in *FLFP* in the same year (Table 9). The lagged effects excluding (including) the economic integration variables are 10% (5%) (Table 9). A similar pattern is noticed for the income panels (Tables 9 and 10). Note that the role of life expectancy diminished somewhat after economic integration variables were introduced (Tables 9 and 10). Economic integration, particularly through FDI flows and local multinational operations, has facilitated technology transfer, which, in turn, has reduced the need for physical strength and the risk of injury to perform job tasks (see, Goldin, 1990; Sauré and Zoabi, 2014; Black and Spitz-Oener, 2010). Hence, while economic integration may – through the use of technology – have helped reduce some pressure on the health of workers, leading to a reduced correlation between health and female labour force participation, health, represented by life expectancy, is still the most important determinant of female labour force participation in Vietnam. This result is consistent with prior discussion of working conditions confronting Vietnamese women working in export industries.

Fourth, improvement in Vietnam's level of economic development has reduced female labour force participation. The apparent negative effect is slightly higher with economic integration, which confirms that economic integration played a role (Table 9). Trade with high- and upper middle-income countries was more strongly responsible for this than trade with low-income countries (Table 10). This negative outcome of economic development, as discussed in Sections (1) and (3), is featured widely in the literature, and we contribute to this literature by providing direct evidence that economic integration is contributing to the fall in FLFP for the transitioning Vietnam, putting it on the downward section of the U-shaped effect of economic growth (discussed in section 3.4 above).

Fifth, increased government spending on education (*EDUEXP*) in Vietnam has increased female labour force participation, and the role of government funded education programs for this labour force participation probably became more relevant after economic integration. It seems that as more jobs become available through economic integration, the effectiveness of government funded education programs becomes more apparent. Government spending on education seems to have empowered women to take on the challenges of working in the new industries. We also note that in Table 10, model (2) implies that the government's education programs' effectiveness in empowering women occurred within the first year of training for jobs that resulted from trade with upper middle-income countries, rather than trade with high- or low-income countries. The effectiveness of government programs is noticed after one year for jobs that rely on trade with high-income nations (Table 10, model 3).

VII. CONCLUSION

This study investigates the impact for Vietnam's female labour force participation of economic integration, in the form of trade with 54 trading partners (segmented into various income groups) over the period 1986-2014, where we also look at the impact of the MFA and joining the WTO. We add to the current knowledge on factors that improve female labour force participation through three key findings. First, while exports lead to higher female labour force participation, it is exports to

higher income countries that have more strongly driven this result than middle- or low-income countries. Second, developments during the MFA period, namely the EU preferential quota, the lifting of the US embargo, and improved US-Vietnam trade relations through a reduction of tariffs faced by Vietnamese exports in the US, have (on average) improved female labour force participation in Vietnam. It needs to be said that this period allowed Vietnam to become more competitive in labour intensive manufacturing, which helped increase female employment. Third, despite the growth in exports from Vietnam since their membership of WTO, the WTO period has had a negative impact on female labour force participation. This finding is probably related to the shifting comparative advantage from labour to technology-intensive manufacturing. These results were derived after controlling for other determinants of female labour force participation. The significant trade-female labour force participation relationship portrayed in this paper implies that trade policymakers should not discount their ability to influence the economic wellbeing of women. Our results on the WTO period suggest the need for effective legislation around trade agreements to empower females.

Our findings on the differences in the impact of trade by trading partners imply two things. First, the ranking of the impact by income group is consistent with Vietnam's export growth trends by income group. Over the years, Vietnam's exports to high-income nations have grown rapidly and are the strongest with these trade partners, and this trend is followed consecutively by middle- and low-income groups. In other words, women have been filling in for the increase in the demand for labour that is created by the growth in certain export industries. This is a positive sign for female economic wellbeing. But as our results with *FEOUT* (females of lower secondary school age) indicate, the jobs filled by women are those that are probably temporary and require low skill. Second, the actual percentage differences in the impact by different trading partner group highlight the fact that females are not equally favored in all export industries. We show that females are least favored in industries that export to low and lower middle-income countries and most favored in trade to high-income countries. Vietnam's female labour force characteristics match more to female labour forces in low- and middle-income groups than to those of high-income countries, hence our results are probably depicting that Vietnam has a stronger comparative advantage in employing females for exports to high-income trading partners than in the case of middle- or low-income trade partners. In terms of policy, this means that the government of Vietnam should consider focusing on industries that are exporting goods and services to high-income countries to create opportunities and better pathways for women to enter these industries.

Further, the positive influence of the *MFA* on *FLFP* suggests that economic integration during the MFA period encouraged the paid employment of women in Vietnam. The negative impact of *WTO* (or the non-MFA period) on *FLFP* suggests that Vietnam had lost some of the comparative advantage of what the female labour force produced, particularly in terms of textiles and clothing. It implies that while higher export growth provided the basis for more employment for women, and the MFA helped nurture the industry that primarily employs women (despite the industry's trade restrictions with the EU and US), the advent of freer trade has displaced some women from the work force. Going forward, Vietnamese

policymakers may wish to allow for this in trade policy changes. Further, government policy on training and education, and legislation that governs trade and the flow of investment into the country can support the female labour force in industries where Vietnam has a comparative advantage, specifically, as our study identifies, in export industries that cater for high-income trading partners.

An examination of the traditional determinants of female labour force participation led to the conclusion that health status not only has a positive effect, it is also an important determinant, more important than economic integration variables or the other variables examined here. Further, it seems that economic integration, through technology transfer, may have helped soften the effects of some traditionally negative health issues for female labour force participation, such as the opportunity of less arduous work conditions in new industries. Other results suggest that in Vietnam fertility rate (economic growth) was found to be positively (negatively) related to female labour force participation and this correlation reduced (increased) in the presence of economic integration. We also found evidence that economic integration variables probably had a role in strengthening the work force impact of female adolescents out of school, and that government spending on education affected female labour force participation, both of which imply that economic integration increased job opportunities for women in Vietnam in the studied period. Together, these findings on the economic growth, health status, and fertility rate of the Vietnamese female work force indicate that while economic integration is providing jobs and improving material wealth for women, there remain some serious concerns regarding women's health and safety, as well as job security, that seem to be blocking women from enjoying the full benefit of higher labour force participation. Our study relied on limited published macro-data. Future studies in this area that utilize more detailed labour market survey industry-based data would be able to shed more light on our findings.

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