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# How Do Female Labor Force Participation Rates Change During Episodes of Globalization and Marginalization? Global Evidence from 1990 to 2019

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## ***Abstract***

*Despite the overall economic globalization we have seen during the last few decades, which for example is evident by the increase in the share of world exports to world GDP, it is now well-established that the exports-to-GDP ratios have been decreasing for about one third of the world's countries during the last three decades. This paper examines how labor force participation rates (LFPRs) have changed during episodes of significant globalization and significant marginalization based on the experience of 137 countries and territories from 1990 to 2019. We examine female LFPRs, male LFPRs, and the difference between female and male LFPRs. To reduce the distortion resulting from changes in tertiary education rates, we focus on LFPRs between ages 25 to 64. Our regression results indicate that both globalization and marginalization had a negative impact on female LFPRs between ages 25-64, which increased the difference between female and male LFPRs.*

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## I. Introduction

There is a large amount of literature examining the impact of globalization on gender, including examining the relationship between globalization and female labor force participation rates (FLFPRs). However, this literature is far from conclusive. For example, contrary to the mainstream view in the literature, Wacker, Cooray and Gaddis (2017) found that both foreign direct investment (FDI) and trade have a generally negative impact on female labor force participation. Similarly, Sauré and Zoabi (2014) developed a theoretical model to argue that the FLFPRs can actually decline when international trade expands in sectors which use female labor intensively. In addition to various cross-country studies, there are also many country-specific studies, which come to all kind of sophisticated conclusions on the relationship between globalization and FLFPRs.

Despite the large literature, what is missing is a comprehensive global study that is based on all kinds of countries, not just a specific group of countries, like developing countries (see for example, Klasen, 2017) or industrialized countries (see for example, Dvorkin and Shell, 2015). This paper covers all countries and territories for which the World Bank's (2020) World Development Indicators (WDI) database has a nearly complete time series from 1990 to 2019 for female and male labor force participation rates (which are two of our key endogenous variables), and exports-to-GDP ratios (which are the basis for our key exogenous variables). It turns out that such data is available for 137 countries and territories, covering all continents and all income groups.<sup>1</sup>

Various papers concluded that the different ways globalization is defined make a difference for how globalization impacts FLFPRs. For example, Fatima and Khan (2019) concluded that taking cumulative measures of exports and imports often camouflages the impact of trade on female employment and that the disintegration of export and import share according to their trading partners reveals that exports and imports from the developed world alone contribute to higher female employment. Similarly, Li, Su, Tao and Hao (2019) have pointed out that there might be a difference between looking at the relationship between a) exports-to-GDP ratios and FLFPRs and b) imports-to-GDP ratios and FLFPRs. However, instead of differentiating our analysis between exports and imports, we limit our analysis to exports-to-GDP ratios, but then differentiate our analysis between periods during which countries experienced a significant globalization and periods during which countries experienced a significant marginalization.

Building on the contribution by Wacker, Cooray and Gaddis (2017), this paper takes into account that the effects of globalization and marginalization may be different for certain age groups of women. More specifically, we take into account that FLFPRs between ages 15-64 might be distorted by changes in female tertiary school enrollments (especially in developing countries). Hence, we limit our analysis initially to LFPRs between ages 25-64.<sup>2</sup>

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<sup>1</sup> These 137 countries and territories cover countries with large populations (like China) and countries with tiny populations (like St. Kitts and Nevis), 31 of the 37 members of the Organisation for Economic Co-operation and Development (OECD), 34 of the 46 countries of Sub-Saharan Africa (SSA), and 9 of the 13 members of the Organization of the Petroleum Exporting Countries (OPEC).

<sup>2</sup> Given that the World Bank's (2020) WDI database does not provide any data for labor force participation rates for ages 25-64, the authors calculated these rates based on population ratios and labor force participation rates for ages 15-24 and ages 15-64. Furthermore, given the large gaps in national estimates for labor force participation rates, we used the modeled estimates of the International Labor Organization (ILO), as provided in the WDI database.

Following this introduction (Section I), the paper is structured into four sections. Section II provides some explanations on the methodology for defining episodes of significant globalization and episodes of significant marginalization. Section III details the various regression specifications, while Sections IV.1 and IV.2 provide, respectively, the regression results for examining the relationship between various LFPRs and globalization and marginalization. Section IV.3 reports on the results for using the LFPRs between ages 15 to 24 as the endogenous variable. The last section (Section V) offers some conclusions.

## **II. Methodology for Defining Globalization and Marginalization**

To reduce the volatility and noise of annual data, all of the variables have been averaged over three years: 1990-1992, 1993-1995, and so on until 2017-2019.<sup>3</sup> Given our 137 countries and 30 years of observation (1990-2019) and that the data was averaged over three years, we have a total of 1370 observations for LFPRs (i.e., a complete set of 10 three-year averages for 137 countries/territories) and 1362 observations for exports-to-GDP ratios (i.e., a nearly complete set of data).

We first checked if there is any relationship between various LFPRs and exports-to-GDP ratios. We run a variety of regressions using three alternative endogenous variables (the difference between female and male LFPRs, female LFPRs, and male LFPRs), a variety of exogenous variables (including the exports-to-GDP ratio), and a variety of country dummies (like for OECD countries, SSA countries, and OPEC member states). However, as expected, no such relationship could be established for our 137 countries and territories.

We then ran another set of regressions for which all the observations for exports-to-GDP ratios were split into two parts: a.) episodes of increasing exports-to-GDP ratios (which are defined as country-specific three-year periods during which the exports-to-GDP ratio increased compared to the previous three-year average), and b.) episodes of decreasing exports-to-GDP ratios (which are defined as country-specific three-year periods during which the exports-to-GDP ratio decreased compared to the previous three-year average). But as expected, no significant relationship could be found between any of the labor force participation rates and either increasing or decreasing exports-to-GDP ratios.

Building on Gunter and Wilcher (2020), we then define an episode of significant globalization as a three-year period during which a country's exports-to-GDP ratio increased twice as much in percentage points as the ratio of world exports-to-world GDP increased between two three-year averages. For example, at the global level, the exports-to-GDP ratio has increased by 0.97 percentage points between 1987-89 (17.72 percent) and 1990-92 (18.69 percent). Hence, a country is considered to have experienced an episode of significant globalization during this period (i.e., during 1990-92 relative to 1987-89) if the country's export-to-GDP ratio has increased by at least 1.94 percentage points (i.e., two times the world average of 0.97 percentage points). On the other hand, a country is considered to have experienced an episode of significant marginalization if the country's export-to-GDP ratio has decreased by at least 0.97 percentage points during 1990-92 compared to 1987-89 (i.e., the negative value of the world average percentage point increase).<sup>4</sup>

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<sup>3</sup> For the few cases in which data for 2019 is missing but data is available for 2017 and 2018, the 2017-19 average has been calculated based on the average of the data for 2017 and 2018.

<sup>4</sup> For periods during which the world exports-to-GDP ratio decreased, an episode of significant marginalization is defined as a three-year period during which a country's exports-to-GDP ratio has

Using this methodology for defining episodes of significant globalization and significant marginalization, it turns out that among our 1359 observations,<sup>5</sup> 458 observations (33.7 percent) are episodes of significant globalization, 424 observations (31.2 percent) are episodes of significant marginalization, and 477 observations (35.1 percent) are considered neither one.

Based on these definitions for episodes of significant globalization and significant marginalization, which are our two key alternative exogenous variables, we then ran a consistent set of regressions for three alternative endogenous variables: the difference between female and male LFPRs, the female LFPR, and the male LFPR.

### III. Regression Specifications

We are first interested to find out if there is a robust relationship between episodes of significant globalization and the difference between female and male LFPRs (our first key endogenous variable). Hence, excluding a variety of country dummies (see details in the regression results below), which serve as robustness checks, our first basic regression specification is provided in equation (1):

$$DLFPR_{t,i} = \alpha + \beta GLOBI_{t,i} + \gamma FERT_{t-1,i} + \delta UNC_{t-1,i} + \zeta PCYL_{t-1,i} + \eta RURAL_{t-1,i} + \varepsilon_{t,i} \quad (1)$$

whereby

$\alpha$  is a constant;

$DLFPR_{t,i}$  is the difference between female and male LFPR (defined as male LFPR minus female LFPR) for a three-year average for country  $i$ ;

$GLOBI_{t,i}$  stands for a significant episode of globalization (as defined above) for a three-year average for country  $i$ ;

$FERT_{t-1,i}$  stands for fertility rate for the previous three-year average for country  $i$ ;

$UNC_{t-1,i}$  stands for macroeconomic uncertainty (approximated by the volatility of the nominal exchange rate) during a previous three-year average for country  $i$ ;

$PCYL_{t-1,i}$  stands for the log of per capita GDP for the previous three-year average for country  $i$ ;

$RURAL_{t-1,i}$  stands for the share of the rural population in the previous three-year average for country  $i$ ; and

$\varepsilon_{t,i}$  is a time and country-specific error term.

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decreased twice as much in percentage points as the ratio of world exports-to-world GDP has decreased between two three-year averages, while an episode of significant globalization is defined as a three-year period during which a country's exports-to-GDP ratio has increased by at least the same percentage points the world exports-to-GDP ratio has decreased.

<sup>5</sup> Another three observations were lost due to additional data gaps for exports-to-GDP ratios for 1987-1989, to which the exports-to-GDP ratios for 1990-1992 had to be compared with.

These exogenous variables have been included in the regression specification based on the literature examining LFPRs and the limited data gaps for these exogenous variables, which nevertheless reduce the number of observations for the regressions to 241 in the case of examining globalization and 208 in the case of examining marginalization. Given the robust regression results provided in the next section, we then run similar regressions with the female and male LFFR being alternative endogenous variables (respectively, equations 2 and 3), to explore potential sources for the robust relationship between episodes of significant globalization and the difference between female and male LFPRs.

$$FLFPR_{t,i} = \alpha + \beta GLOBI_{t,i} + \gamma FERT_{t-1,i} + \delta UNC_{t-1,i} + \zeta PCYL_{t-1,i} + \eta RURAL_{t-1,i} + \varepsilon_{t,i} \quad (2)$$

$$MLFPR_{t,i} = \alpha + \beta GLOBI_{t,i} + \gamma FERT_{t-1,i} + \delta UNC_{t-1,i} + \zeta PCYL_{t-1,i} + \eta RURAL_{t-1,i} + \varepsilon_{t,i} \quad (3)$$

Following the examination between various LFPRs and significant globalization, we were also interested in examining if there is a robust relationship between various LFPRs and episodes of significant marginalization. Hence, our fourth to sixth basic regression specifications are similar to equations (1) to (3), though replacing episodes of significant globalization (GLOBI) with episodes of significant marginalization (MARGI):

$$DLFPR_{t,i} = \alpha + \beta MARGI_{t,i} + \gamma FERT_{t-1,i} + \delta UNC_{t-1,i} + \zeta PCYL_{t-1,i} + \eta RURAL_{t-1,i} + \varepsilon_{t,i} \quad (4)$$

$$FLFPR_{t,i} = \alpha + \beta MARGI_{t,i} + \gamma FERT_{t-1,i} + \delta UNC_{t-1,i} + \zeta PCYL_{t-1,i} + \eta RURAL_{t-1,i} + \varepsilon_{t,i} \quad (5)$$

$$MLFPR_{t,i} = \alpha + \beta MARGI_{t,i} + \gamma FERT_{t-1,i} + \delta UNC_{t-1,i} + \zeta PCYL_{t-1,i} + \eta RURAL_{t-1,i} + \varepsilon_{t,i} \quad (6)$$

We also included fixed effects for countries that belong to the Organization of the Petroleum Exporting Countries (OPEC), Organisation for Economic Co-operation and Development (OECD) or Sub Saharan Africa (SSA) to control for the time-invariant differences across these groups of countries that might affect the labor force participation rate.

## IV. Empirical Results

### IV.1. Empirical Results for Episodes of Significant Globalization

As Table 1 shows, episodes of significant globalization (as defined in Section II above) are robustly correlated with an increase in the difference between female and male LFPRs, controlling for fertility rates, macroeconomic uncertainty, GDP per capita, the share of rural population and various country dummies. For all four alternative regression specifications, the level of significance for the globalization indicator is at least 95 percent, twice even above 99 percent. Given that the difference between female and male LFPRs is defined as male LFPR minus female LFPR, the positive sign for the globalization variable indicates that the difference between female and male LFPRs have increased during episodes of significant globalization (though regressions do strictly speaking of course not imply any causality).

It is important to keep the definition of episodes of significant globalization in mind when interpreting these results. First, it should be stressed that episodes of significant globalization should not be confused with major growth episodes. Though there is a tiny positive correlation (the correlation coefficient is 0.05) between episodes of significant globalization and GDP per

capita growth, an episode of significant globalization only implies that exports have grown faster than GDP, hence, resulting in an increase in the exports-to-GDP ratio. There actually are some episodes of significant globalization during which GDP per capita growth has been negative (while exports continued to grow), hence, resulting in a significant increase in the exports-to-GDP ratio.

Second, the increase in exports does not have to be gender-neutral in terms of labor employed to produce the increased exports. Some export sectors may employ more female labor (like is for example the case in Bangladesh's garments sector), while other export sectors may employ more male labor (like is typically the case for Nigeria's oil sector). The positive sign for the globalization variable could indicate that export sectors employing more male workers have grown faster than export sectors employing more female workers. It does not imply that there are no female workers in export sectors.

**Table 1: Regression Results for Episodes of Significant Globalization using the Difference between Female and Male LFPRs (between ages 25 to 64) as Endogenous Variable**

	(a)	(b)	(c)	(d)
Globalization	0.088** (0.038)	0.111*** (0.033)	0.070** (0.033)	0.078*** (0.029)
OECD Dummy				-5.049* (2.731)
SSA Dummy			-37.739*** (4.197)	-33.006*** (3.556)
OPEC Dummy		35.704*** (3.768)		29.991*** (3.375)
Fertility rate (lagged)	1.626 (1.048)	-1.962** (0.970)	7.963*** (1.147)	4.137*** (1.047)
Uncertainty (lagged)	0.017 (0.011)	0.021** (0.009)	0.004 (0.009)	0.009 (0.008)
GDP pc (log, lagged)	-12.941*** (2.868)	-13.310*** (2.444)	-11.247*** (2.485)	-8.378*** (2.783)
Rural Pop. (lagged)	-0.462*** (0.093)	-0.286*** (0.082)	-0.367*** (0.081)	-0.210*** (0.070)
Observations	241	241	241	241
R-squared	0.151	0.386	0.369	0.559

Standard errors are in parenthesis:

\*\*\*  $p < 0.01$ , \*\*  $p < 0.05$ , \*  $p < 0.1$

Third, at this point, looking at the results of Table 1, we do not know the source for the positive sign of the globalization variable. The sign could be positive because female LFPRs are decreasing while male LFPRs are increasing during episodes of significant globalization; or the sign could be positive simply because male LFPRs are increasing faster than female LFPRs. A positive sign is

even consistent with both, female and male LFPRs decreasing, as long as the female LFPRs are decreasing more than the male LFPRs. To shed more light on the source of the positive sign for the globalization variable, we ran regressions examining the relationship between globalization and female LFPR and then examining the relationship between globalization and male LFPR.

Table 2 shows that episodes of significant globalization are robustly correlated with a decrease in female LFPRs, controlling for fertility rates, macroeconomic uncertainty, GDP per capita, the share of rural population and various country dummies. Similar as in Table 1, for all four alternative regression specifications, the level of significance is at least 95 percent, twice even above 99 percent for the globalization variable.

**Table 2: Regression Results for Episodes of Significant Globalization using the Female LFPR (between ages 25 to 64) as Endogenous Variable**

	(a)	(b)	(c)	(d)
Globalization	-0.096** (0.037)	-0.122*** (0.030)	-0.082** (0.034)	-0.093*** (0.028)
OECD Dummy				4.921* (2.598)
SSA Dummy			31.870*** (4.242)	26.493*** (3.384)
OPEC Dummy		-39.449*** (3.444)		-34.555*** (3.212)
Fertility rate (lagged)	-0.854 (1.017)	3.111*** (0.886)	-6.205*** (1.159)	-1.813* (0.996)
Uncertainty (lagged)	-0.013 (0.010)	-0.017** (0.008)	-0.002 (0.009)	-0.007 (0.007)
GDP pc (log, lagged)	13.127*** (2.785)	13.535*** (2.234)	11.697*** (2.512)	8.989*** (2.648)
Rural Pop. (lagged)	0.505*** (0.091)	0.311*** (0.075)	0.425*** (0.082)	0.248*** (0.067)
Observations	241	241	241	241
R-squared	0.154	0.458	0.318	0.577

Standard errors are in parenthesis:

\*\*\*  $p < 0.01$ , \*\*  $p < 0.05$ , \*  $p < 0.1$

On the other hand, as Table 3 shows, there is no robust relationship between episodes of significant globalization and the male LFPR. The negative sign for the globalization variable in Table 3 seems to indicate a negative correlation between globalization and male LFPRs. However, given that the globalization variable is not significant in Table 3, this is far from certain. In any case, comparing the results across Tables 1 to 3, we can conclude that episodes of significant globalization are highly correlated with lower female LFPRs and given that there is no robust correlation with the

male LFPR, this then implies that episodes of significant globalization cause an increase in the difference between female and male LFPRs.

The reduction in female LFPRs during episodes of significant globalization can be due to either lower female LFPRs in the tradeable or non-tradeable sectors. In countries with relatively low export-to-GDP ratios, there is some indication that the lower female LFPRs are coming from the non-tradeable sectors, given the relatively strong and robust reduction in female LFPRs.

**Table 3: Regression Results for Episodes of Significant Globalization using the Male LFPR (between ages 25 to 64) as Endogenous Variable**

	(a)	(b)	(c)	(d)
Globalization	-0.009 (0.009)	-0.011 (0.009)	-0.011 (0.009)	-0.015* (0.009)
OECD Dummy				-0.128 (0.843)
SSA Dummy			-5.869*** (1.130)	-6.513*** (1.098)
OPEC Dummy		-3.745*** (1.058)		-4.564*** (1.042)
Fertility rate (lagged)	0.772*** (0.257)	1.149*** (0.272)	1.758*** (0.309)	2.324*** (0.323)
Uncertainty (lagged)	0.004 (0.003)	0.004 (0.003)	0.002 (0.002)	0.001 (0.002)
GDP pc (log, lagged)	0.186 (0.703)	0.225 (0.687)	0.449 (0.669)	0.611 (0.859)
Rural Pop. (lagged)	0.043* (0.023)	0.025 (0.023)	0.058*** (0.022)	0.038* (0.022)
Observations	241	241	241	241
R-squared	0.183	0.225	0.268	0.327

Standard errors are in parenthesis:

\*\*\*  $p < 0.01$ , \*\*  $p < 0.05$ , \*  $p < 0.1$

#### IV.2. Empirical Results for Episodes of Significant Marginalization

As shown in Tables 4 to 6, the regression results for episodes of significant marginalization (as defined in Section II above) are very close to the results for episodes of significant globalization, shown in Tables 1 to 3. Table 4 shows that episodes of significant marginalization are robustly correlated with an increase in the difference between female and male LFPRs, controlling for fertility rates, macroeconomic uncertainty, GDP per capita, the share of rural population and various country dummies. For all four alternative regression specifications provided in Table 4, the level of significance for the marginalization indicator is at least 95 percent, twice even above 99 percent.

Table 5 shows that episodes of significant marginalization are robustly correlated with a decrease in female LFPRs, controlling for fertility rates, macroeconomic uncertainty, GDP per capita, the share of rural population and various country dummies. Similar as in Tables 1, 2 and 3, the level of significance is at least 95 percent, twice even above 99 percent for the globalization variable. And similar to Table 3, Table 6 shows that there is no robust relationship between episodes of significant marginalization and the male LFPR, which then again indicates that the increase in the difference between female and male LFPRs is caused by the decreasing female LFPRs.

**Table 4: Regression Results for Episodes of Significant Marginalization using the Difference between Female and Male LFPRs (between ages 25-64) as Endogenous Variable**

	(a)	(b)	(c)	(d)
Marginalization	0.105** (0.049)	0.128*** (0.044)	0.098** (0.045)	0.105*** (0.040)
OECD Dummy				-4.282 (3.115)
SSA Dummy			-28.151*** (4.562)	-29.095*** (3.971)
OPEC Dummy		29.916*** (4.319)		29.394*** (4.004)
Fertility rate (lagged)	-1.432 (1.209)	-3.557*** (1.131)	3.695*** (1.387)	1.899 (1.237)
Uncertainty (lagged)	0.388* (0.222)	0.183 (0.202)	0.204 (0.206)	0.013 (0.182)
GDP pc (log, lagged)	-9.229** (3.627)	-12.176*** (3.294)	-8.700*** (3.335)	-9.107*** (3.490)
Rural Pop. (lagged)	-0.170* (0.092)	-0.111 (0.083)	-0.153* (0.085)	-0.087 (0.074)
Observations	208	208	208	208
R-squared	0.067	0.247	0.216	0.414

Standard errors are in parenthesis:

\*\*\*  $p < 0.01$ , \*\*  $p < 0.05$ , \*  $p < 0.1$

**Table 5: Regression Results for Episodes of Significant Marginalization using the Female LFPR (between ages 25-64) as Endogenous Variable**

	(a)	(b)	(c)	(d)
Marginalization	-0.105** (0.048)	-0.132*** (0.040)	-0.099** (0.045)	-0.124*** (0.038)
OECD Dummy				0.745 (2.911)
SSA Dummy			24.030***	25.445***

			(4.581)	(3.711)
OPEC Dummy		-36.366*** (3.961)		-37.021*** (3.742)
Fertility rate (lagged)	2.128* (1.187)	4.712*** (1.038)	-2.248 (1.393)	0.104 (1.156)
Uncertainty (lagged)	-0.355 (0.218)	-0.105 (0.185)	-0.198 (0.207)	0.063 (0.171)
GDP pc (log, lagged)	9.834*** (3.561)	13.416*** (3.022)	9.382*** (3.349)	12.573*** (3.261)
Rural Pop. (lagged)	0.170* (0.090)	0.099 (0.076)	0.156* (0.085)	0.081 (0.069)
Observations	208	208	208	208
R-squared	0.074	0.347	0.185	0.473

Standard errors are in parenthesis:

\*\*\*  $p < 0.01$ , \*\*  $p < 0.05$ , \*  $p < 0.1$

**Table 6: Regression Results for Episodes of Significant Marginalization using the Male LFPR (between ages 25-64) as Endogenous Variable**

	(a)	(b)	(c)	(d)
Marginalization	-0.000 (0.013)	-0.005 (0.012)	-0.001 (0.013)	-0.018 (0.012)
OECD Dummy				-3.536*** (0.946)
SSA Dummy			-4.122*** (1.321)	-3.650*** (1.206)
OPEC Dummy		-6.450*** (1.225)		-7.627*** (1.216)
Fertility rate (lagged)	0.696** (0.329)	1.155*** (0.321)	1.447*** (0.402)	2.002*** (0.376)
Uncertainty (lagged)	0.033 (0.060)	0.078 (0.057)	0.006 (0.060)	0.076 (0.055)
GDP pc (log, lagged)	0.605 (0.986)	1.240 (0.935)	0.682 (0.966)	3.466*** (1.060)
Rural Pop. (lagged)	0.001 (0.025)	-0.012 (0.024)	0.003 (0.024)	-0.005 (0.022)
Observations	208	208	208	208
R-squared	0.032	0.149	0.077	0.242

Standard errors are in parenthesis:

\*\*\*  $p < 0.01$ , \*\*  $p < 0.05$ , \*  $p < 0.1$

Given the very close results between Tables 1 to 3 and Tables 4 to 6, the comments made on the results provided in Tables 1 to 3 apply also to the results provided in Tables 4 to 6, though after replacing references to episodes of significant globalization with episodes of significant marginalization and stressing that episodes of significant marginalization should not be interpreted as episodes of negative GDP per growth. While the correlation coefficient between episodes of significant marginalization and GDP per capita growth is negative, the value of -0.03 indicates that the two are basically not correlated, neither positively nor negatively.

### IV.3. Empirical Results for LFPRs between ages 15 to 24

Finally, we run the same six regressions as specified in equations (1) to (6) and detailed in Tables 1 to 6 for the LFPRs between ages 15 to 24 (instead of using the LFPRs between ages 25 to 64). However, there were no robust results for the LFPRs between ages 15 to 24, with exception of the regression specification provided in equation 5. As Table 7 shows, episodes of significant marginalization are robustly correlated with a decline in the female LFPR between ages 15 to 24, which are essentially the same results as those provided in Table 5 for the female LFPR between ages 25 to 64, except that both, the fertility rate and the share of rural population are far more significant determinants for the female LFPR between ages 15 to 24 than for the female LFPR between ages 25 to 64. One among many other explanations is that females between ages 15 to 24 may choose tertiary education during episodes of significant marginalization, though as stressed before, episodes of significant marginalization should not necessarily be interpreted as episodes of economic decline.

**Table 7: Regression Results for Episodes of Significant Marginalization using the Female LFPR (between ages 15-24) as Endogenous Variable**

	(a)	(b)	(c)	(d)
Marginalization	-0.085** (0.041)	-0.110*** (0.033)	-0.082** (0.040)	-0.090*** (0.033)
OECD Dummy				4.748* (2.577)
SSA Dummy			10.479** (4.123)	11.514*** (3.285)
OPEC Dummy		-33.638*** (3.279)		-32.300*** (3.312)
Fertility rate (lagged)	2.700*** (1.018)	5.090*** (0.859)	0.792 (1.254)	2.765*** (1.024)
Uncertainty (lagged)	-0.151 (0.187)	0.081 (0.153)	-0.082 (0.186)	0.128 (0.151)
GDP pc (log, lagged)	12.440*** (3.054)	15.754*** (2.501)	12.243*** (3.014)	12.665*** (2.887)
Rural Pop. (lagged)	0.218*** (0.077)	0.152** (0.063)	0.212*** (0.076)	0.139** (0.061)
Observations	208	208	208	208
R-squared	0.102	0.411	0.130	0.455

Standard errors are in parenthesis:

\*\*\*  $p < 0.01$ , \*\*  $p < 0.05$ , \*  $p < 0.1$

## V. Conclusion

This paper confirms that there is no systematic relationship between LFPRs and the ratio of exports-to-GDP at the global level (even though some country-specific examinations may have found such a relationship). However, limiting the analysis to episodes of significant increases in the exports-to-GDP ratios, using a global data set that includes all countries and territories for which there is a nearly complete set of data available from 1990 to 2019, we find that female LFPRs between ages 25 to 64 are negatively correlated with episodes of significant globalization, while there is no robust relationship between episodes of significant globalization and male LFPRs between ages 25 and 64. This then also implies that there is a robust relationship between episodes of significant globalization and increasing differences between female and male LFPRs between ages 25 to 64.

Similarly, we find the same relationships between the various LFPRs between ages 25 and 64 and episodes of significant marginalization. On the other hand, there is no robust relationship between globalization or marginalization and LFPRs between ages 15 to 24, with exception of a robust negative correlation between the female LFPR between ages 15 to 24 and episodes of significant marginalization. Further research would be useful to examine the sources for the declining female LFPRs during episodes of significant globalization and marginalization, including if they are due to changes in the tradeable or non-tradeable sectors.

## References

- Dvorkin, Maximiliano A. and Hannah G. Shell (2015). A Cross-Country Comparison of Labor Force Participation. *Economic Synopses*, No. 17, 2015; available at: <https://doi.org/10.20955/es.2015.17>.
- Fatima, Syeda Tamkeen and Abdul Qayyum Khan (2019). Globalization and Female Labor Force Participation: The Role of Trading Partners. *The Journal of International Trade & Economic Development*, Vol. 28, No. 3, pp. 365–390.
- Gunter, Bernhard G. and Britni Wilcher (2020). Three Decades of Globalisation: Which Countries Won, which Lost? *The World Economy*, Vol. 43, No. 4 (April 2020), pp. 1076–1102; available at: <https://onlinelibrary.wiley.com/doi/full/10.1111/twec.12915>.
- Klasen, Stephan (2017). What Explains Uneven Female Labor Force Participation Levels and Trends in Developing Countries? Paper presented at the 3rd IZA/DFID GLM-LIC Research Conference: New Research on Labor Markets in Low-Income Countries (October 20, 2017); available at: [http://conference.iza.org/conference\\_files/GLMLICNetwork\\_2017/klasen\\_s146.pdf](http://conference.iza.org/conference_files/GLMLICNetwork_2017/klasen_s146.pdf).
- Li, Zheng-Zheng; Chi-Wei Su, Ran Tao and Lin-Na Hao (2019). Enhance or Depress? The Effect of Trade on Active Females in the Labour Market. *Economic Research-Ekonomska Istraživanja*, Vol. 32, No. 1, pp. 2680–2698.
- Sauré, Philip and Hosny Zoabi (2014). International Trade, the Gender Wage Gap and Female Labor Force Participation. *Journal of Development Economics*, Vol. 111, pp. 17–33.
- Wacker, Konstantin M.; Arusha Cooray and Isis Gaddis (2017). Globalization and Female Labor Force Participation in Developing Countries: An Empirical (Re-)Assessment. In: Bent

Jesper Christensen and Carsten Kowalczyk (eds.) *Globalization* (Berlin, Heidelberg: Springer), pp. 545–583.

World Bank (2020). *World Development Indicators (WDI) Database* (Washington, DC: The World Bank); as posted on the World Bank website: <http://data.worldbank.org/data-catalog/> (downloaded on January 30, 2020).