A within-country analysis of the relationship between female labour force participation and different stages of economic development: micro-level evidence from Mexico. [[1]](#footnote-1)

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Abstract

This descriptive paper is the first to evaluate a specific hypothesis of the U-shaped female labour force function, which indicates that in middle-income countries like Mexico, low FLPRs are associated with its high percentage of industrial jobs and a social stigma towards women working in blue-collar occupations. The regression analysis relies on an innovative empirical strategy based on microdata from Mexico’s ENOE household survey. Using repeated cross-sectional data from the first quarters of 2005, 2010, 2015, and 2019, I ran probit regressions to estimate women’s likelihood of being economically active based on the percentage of agricultural, industrial, and service jobs in the municipality where they live. Contrary to the hypothesis, the results show that a higher percentage of industrial jobs at the municipal level is associated with higher female labour participation after controlling for individual, household, and municipal characteristics. Moreover, a higher percentage of jobs in the service sector exhibits an even stronger positive relationship. Conversely, women’s probability of being economically active decreases as the percentage of agricultural jobs in the municipality increases. Using disaggregated data, I show that the lack of participation of women in agricultural activities is an underlying reason behind low FLPRs in Mexico. Further analysis shows that the lack of female labour demand in rural areas of Mexico could be one of the drivers for the lack of involvement of women in agricultural activities. The within-country analysis confirms that agricultural regions of Mexico have the lowest FLPRs, while service-oriented regions have the highest. Hence, this paper shows that there is an upward trend between FLPRs and different stages of economic development within Mexico, in contrast with the U-shaped relationship observed across countries.

**Keywords:** Female labour force participation, sectoral distribution of employment, economic development, structural transformation, labour demand

**JEL Codes:** J16, J20, J21, O53

# Other abstract proposals

A repeated cross-sectional dataset

Due to the abundance of industrial jobs, since the economic activities in this sector are usually performed by men, as there is a social stigma towards women working in blue-collar jobs, especially those married.

# Introduction

The U-shaped female labour force function in economic development indicates that female labour participation rates (FLPRs) are high in agricultural countries, tend to decline in countries with a high percentage of industrial jobs, and then rise again in developed countries with a service-oriented economy (Goldin 1994). After the publication of this popular and rigorous research paper, several studies have examined this theory following different approaches. Those studies that have made a simple cross-country analysis using cross-sectional data typically validate the existence of the U-shaped relationship (Clark et al, 2003; Verick, 2014; Heath & Jayachandran, 2016). Studies that have evaluated the hypothesis making a cross-country analysis using panel data have also found evidence to support the hypothesis (Mammen and Paxson 2000; Luci 2009; Lundberg 2010; Olivetti 2013). Moreover, some studies have analysed if FLPRs have been following a U-shaped trajectory within a specific country across time, although in this case some authors have been evidence both in favour Goldin (1986; Olivetti 2013) or against the hypothesis (Lahoti and Swaminathan 2016).

On the other hand, there is a lack of studies making a within-country analysis of the relationship between female labour participation and different stages of economic development in a specific point in time. To fill this gap in the literature, this paper makes a within-country analysis of Mexico during the 21st century to evaluate a specific hypothesis of the U-shaped female labour supply function in economic development. The hypothesis to be evaluated indicates that one of the reasons behind low FLPRs in middle-income countries like Mexico is the abundance of industrial jobs in the labour market, since jobs in this sector tend to be occupied by men as there is a social stigma towards women working in blue-collar jobs. Most of the research papers analysing the U-shaped relationship have taken this specific hypothesis as a stylized fact, even when there are no studies from middle-income countries that have empirically evaluated it.

This is a relevant research topic because, while there are numerous studies examining how female labour force participation varies depending on different levels of economic development, there is a lack of empirical assessments specifically investigating the relationship between female labour participation and the sectoral distribution of employment within a country. Therefore, the research questions that this analysis aims to answer are: Do Mexican regions with a higher percentage of industrial jobs have the lowest female labour force participation rates? Do women living in Mexicans regions with a high percentage of industrial jobs have a lower likelihood of being part of the workforce? Are women less likely to work in industrial jobs rather than in agricultural or service jobs?

The main goal of this paper is to evaluate if there is currently a negative relationship between female labour participation and a high percentage of industrial jobs in certain regions of Mexico. Therefore, this paper should not be considered an empirical evaluation of the U-shaped feminisation hypothesis, since the paper is not undertaking a historical analysis to determine if FLPRs in Mexico have been following a U-shaped pattern across time. It is also not studying the evolution of Mexico’s FLPRs from the time when agriculture predominated to modern times where in industry and services jobs predominates. Instead, this paper aims to study if, in recent years, Mexican women show lower likelihood of working in regions with a high percentage of jobs in the industrial sector.

Mexico is an interesting case study to answer these research questions for several reasons. First, because the country has one of the lowest female labour participation rates in Latin America (See Figure 1), and it is part of the declining portion of the U-shaped relationship observed across countries (See Figure 2). Second, because researchers could argue that low FLPRs could be related to the fact that Mexico is the Latin-American country with the highest percentage of jobs in the industrial sector (See Figure 3). Third, because Mexico has regional disparities, where the northern and central states have labour markets dominated by the industrial or the service sectors, while in the southern part of the country there is still a large percentage of jobs in the agricultural sector (See Figure 4). Finally, because Mexico has incredible microdata with a level of disaggregation that allows me to study the current relationship between FLPRs and different levels of economic development not only across-states but also within them.

The data source of this research is the ENOE household survey, which is the largest survey in the country and the main source of information about Mexico’s labour markets. This survey has been conducted quarterly since 2005, but the extended version is only available in the first quarter of each year. Therefore, this paper considered the datasets from the first quarters of 2005, 2010, 2015, and 2019 to cover a period of 15 years and evaluate the hypothesis at four different points in time.

Moreover, I developed an empirical strategy to answer the research questions using micro-level data. While most of the studies in this subject perform the econometric analysis using aggregated data obtained from time-series, this paper uses highly disaggregated data obtained from household surveys to study the role played by sectoral distribution of employment in female labour participation. Consequently, the econometric analysis is based on a probit model where the dependent variable takes value of 1 if the respondent is economically active and 0 otherwise. The three main independent variables are the percentage of jobs in agriculture, industry, and services at the municipal level. These variables capture the sectoral distribution of employment at a local level and their sum is always equal to 100.

It is worth noting that an advantage of using microdata is that it allowed me to control for other variables that could be affecting female labour participation at the individual level. These control variables encompass individual characteristics of the respondent such as age, marital status, level of education, number of children, among others. The analysis also considers variables related to household characteristics, such as the number of members in the household, sex, age, and marital status of the household head, whether the household is located in rural or urban areas of Mexico, among other things. Lastly, the analysis also includes control variables at the municipal level, such as XXXX..

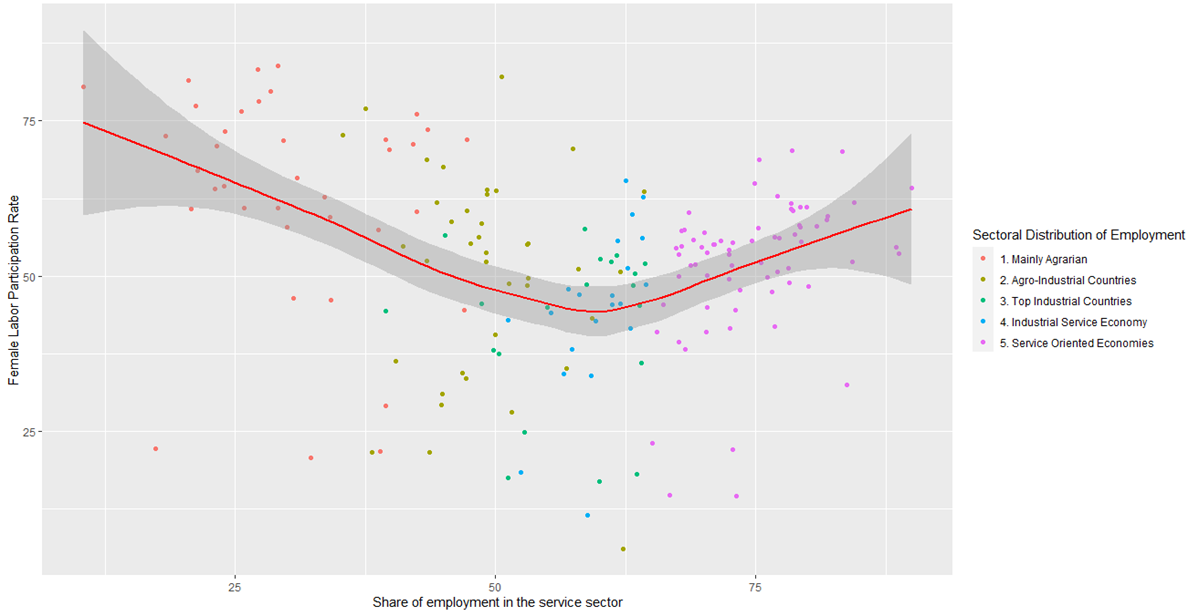
After controlling for individual, household, and municipal characteristics, the econometric analysis reveals interesting results. First,

This research makes several contributions to the literature that studies the relationship between female labour force participation and different stages of economic development. First, my findings contradict the “stilyzed fact” indicating that low FLPRs in a country like Mexico are related to the high percentage of jobs in the industrial sector. Instead, it shows that one of the underlying reasons behind low FLPRs in Mexico is the lack of participation of women in agricultural activities. Additionally, this is the first paper en proponer que la literatura en este tema se estudie considerando usando la variable sectoral distribution of employment en lugar de utilizar GDP per capita or sector specific growth. Además, es el primer en estudiar la relación entre la participación laboral femenina y distintos niveles de desarrollo económico dentro de un país haciendo uso de microdatos en lugar de utilizar series de tiempo, lo que permite un nivel de desagregacion que no se puede encontrar en estudios cross-country.

This research is organized as it follows.

**Figure 3XXX: Female labour participation rates in Latin American Countries (2019)**

Source: World Bank, WDI – Female Labour Participation (% of female population ages 15+).

**Figure 2: Jobs in the industrial sector as a share of total employment in Latin American countries (2019)**

Mexico

Source: World Bank, World Development Indicators - Employment in industry (% of total employment).

A map of mexico with different colored states

Description automatically generated**Figure 5: Map of the sectoral distribution of employment in Mexican states (2019)**

# Literature Review

Goldin (1994) developed a whole theory of how the structural transformation process in combination with factors such as fertility rates, educational attainment, marital status, and other sociological and cultural factors, are playing a role in the U-shaped pattern of FLPRs observed across countries. Since then, other authors have found evidence to support the feminisation U hypothesis observed across countries using both cross-sectional data (eg Psacharopoulos & Tzannatos, 1989; Clark et al, 2003; Verick, 2014; Heath & Jayachandran, 2016) and panel data (Mammen and Paxson 2000; Luci 2009; Lundberg 2010; Olivetti 2013).

On the other hand, Gaddis and Klasen (2014) argued that most of the empirical assessments that have validated the U-shaped relationship observed across countries have several methodological problems. First, they criticized those studies based on simple cross-sectional correlations between FLPRs and GDP per capita as a proxy of economic development (e.g. Psacharopoulos & Tzannatos, 1989; Clark et al, 2003; Verick, 2014; Heath & Jayachandran, 2016). They argue that using cross-sectional data leads to the ‘Kuznets fallacy’ since the relationship should also hold in a time-series context.

Gaddis and Klasen (2014) also highlighted various mistakes in the empirical strategy or in the econometric methods that previous researchers had employed to support the feminisation U. They criticised Çağatay and Özler (1995) for not exploiting the panel feature of their data, Mammen and Paxson (2000) for using a static model rather than a dynamic panel method, and Luci (2009) and Tam (2011) for not taking into consideration the potential endogeneity of GDP. Finally, they also mentioned that estimates of GDP per capita adjusted at purchasing power parities (PPP) have large margins of error, so they should not be used to make empirical evaluations of the U-shaped feminization hypothesis.

Based on these critiques, they decided to use ‘sector-specific growth’ as an alternative measure of the structural transformation process. Additionally, their analysis was done using dynamic panel data methods instead of using a static model. Their results show that the U-shaped vanishes when they use a dynamic model. Their results also indicated that changes in sector-specific growth in agriculture, industry and services have different effects on FLPRs, but that they are particularly small in magnitude, so they concluded that there is little evidence to consider them as key drivers of FLPRs.

Gaddis and Klasen (2014) also recognised that some authors might judge their data on sector specific growth as a ‘noisy’ measure of structural change. They also mentioned that a potential concern of the results is that other researchers could consider that using sectoral growth as the main dependent variable could bias the coefficients towards zero. However, they argued that their data is “at least as problematic” as the data that had previously been used in other studies to test the U-shaped feminisation hypothesis.

In a more recent study, Klasen (2019) also argued that the U-shaped hypothesis would not hold in within-country studies. He presented as an example the study by Lahoti and Swaminathan (2016), which followed a similar approach to Gaddis and Klasen (2014). They executed a state-level analysis in India using data from 1983 to 2012 to assess the U-shaped hypothesis. To do so, they analysed the relationship of FLPRs with net state domestic product (NSDP), as well as with sector-specific growth in value-added and employment across the 28 Indian states. However, they did not find evidence to support the U-shaped hypothesis.

On the other hand, some studies have found evidence of FLPRs following a U-shaped pattern within countries across time. For instance, Goldin (1986) showed that FLPRs in the United States followed a U-shaped pattern between 1890 and 1940. To do so, she had to make an economic history assessment, which showed that FLPRs were high when the United States was primarily agricultural, there was a decline during the industrialization process, and finally, there was a rise of FLPRs during the service sector expansion. Olivetti (2013) provided additional evidence showing that from 1890-2005 both the United States and 16 developed countries showed a consistent U-shaped relationship between FLPRs and different stages of economic development.

Gaddis and Klasen (2014) argued that while today’s advanced economies may have experienced the U-shaped pattern during their process of economic development, today’s developing countries may not be following the same path. This is in line with Olivetti (2013), who mentioned that the U-shaped pattern is more muted when early OECD countries are not included in the cross-country analysis. She mentioned that a possible explanation to these results is that today’s developing countries are not stigmatizing industrial jobs as much as today’s advanced economies did, since industrial jobs are less brawn intensive than before.

Considering the previous discussion, the goal of this paper is to contribute to the literature by following a different approach. First, instead of doing another cross-country analysis, or making another within-country analysis examining FLPRs since Mexico was predominantly agricultural, this is the first paper conducting a within ­­country analysis of the relationship between FLPRs and different stages of economic development. Second, instead of using GDP per capita or sector-specific growth, the paper uses ‘sectoral distribution of employment’[[3]](#footnote-3) as an alternative measure to capture the different stages of economic development. Third, instead of using time-series data, the paper relies on micro-data obtained from Mexico’s National Household Surveys on Employment and Occupations (ENOE). Finally, this paper develops an innovative empirical strategy to be the first one showing the current dynamics between FLPRs and the sectoral distribution of employment across different regions within a country.

# Methodology

This sections outlines fundamental aspects regarding the methodology followed to perform this analysis. It commences with a description of the databases utilised. Then, it explains all the details of the empirical stategy. Despues se presentan las estadisticas descriptivas de la base de datos. Por ultimo, culmina with all the details of the econometric model.

## Dataset

Most of the studies that have analysed the U-shaped hypothesis are based on aggregated data. Conversely, this study uses micro-level data obtained from the extended version of the ENOE survey, which is carried out by the National Institute of Statistics and Geography (INEGI), Mexico’s national statistical office. The ENOE household surveys are the main source of information for most of the labour market statistics for the country. They were introduced in 2005 and collect employment statistics in quarterly periods by making household surveys. The sample in each dataset is large enough to adequately represent rural and urban areas in each of Mexico's 32 states. In addition, the surveys include information on the labour status of individuals and also integrate socio-demographic information like educational level, marital status, number of children and access to social security, among others.

It is worth noting that, during the first quarter of each year, INEGI conducts an amplified survey, while in the second, third and fourth quarters, it conducts a basic survey. Therefore, this study considered four cross-sectional datasets using the ENOE surveys from the first quarters of 2005, 2010, 2015 and 2019. I chose to utilize surveys from the first quarter of these years because they provide the most detailed information, whereas surveys conducted during the other three quarters omit specific questions that are exclusively available in the amplified survey.

Although there is usually a five-year difference between the selected surveys, I used the survey from the first quarter of 2019 because no survey was conducted during the first quarter of 2020 due to the covid-19 pandemic. Additionally, I considered relevant to have five-year intervals since this could help to take into account possible changes in the sectoral distribution of employment across Mexican municipalities during the past 15 years. Therefore, such period spanning capture both the structural transformation of local economies and the changes in female labour participation over the years.

## Empirical strategy

It is important to start this section emphasizing that this research is not an empirical evaluation of the U-shaped hypothesis, as it is not carrying out an economic history analysis to determine whether FLPRs were high when Mexico was an agricultural country, if they decline during the industrial boom, or if they have been increasing during the service sector expansion. If such an approach had been chosen, this research would have turned into a similar analysis to the previous ones, using time-series data and performing an economic history analysis to make an empirical evaluation of the U-shaped feminisation hypothesis. Instead, I have chosen to follow a different approach that allows me to make an original contribution to the literature.

The goal of this paper is to evaluate an specific hypothesis that tries to explain the reasons behing the declining portion of the U-shaped relationship observed across countries. This specific hypothesis indicates that labour markets in middle income countries like Mexico tend to have a high percentage of jobs in the industrial sector, and that women tend not to participate in this sector for several reasons. To make an empirical evaluation of this hypothesis, I had to develop an empirical strategy that allowed to make a within-country analysis of the relationship between sectoral distribution of employment and female labour participation. Hence, the goal of this paper is to make a within-country analysis of the current relationship between female labour force the sectoral distribution of employment observed at different stages of economic development.

I am following this approach to fill another gap in the literature. Klasen (2019) noted that when using cross-country data, it is difficult to disaggregate labour force participation rates to identify and differentiate the level of participation of men and women in each economic sector. Consequently, I decided to perform a within-country analysis using micro-data, since doing so offers a level of disaggregation that cannot be find using time series data or doing cross-country regressions.

One of the limitations of following this approach is that it is necessary to delimit the study to the dates on which data are available. Given that Mexico’s ENOE household survey started in 2005, I discarded the idea of making a long-run analysis and decided to study the current within-country dynamics of FLPRs under different scenarios of the sectoral distribution of employment. Therefore, while the paper takes some of the theoretical underpinnings of the U-shaped feminisation hypothesis, its goal is not to make an empirical evaluation of it.

### Estimation of sectoral distribution of employment

One of the main points to highlight from the empirical strategy is that I estimated the sectoral distribution of employment at the municipal level to use it as a proxy of economic development at the local level. The sectoral distribution of employment is based on three main variables, namely the percentages of jobs in agriculture, industry, and services as a share of the total employment in each municipality. Previous studies analysing the feminisation U-shaped hypothesis have used GDP per capita, as well as sector-specific growth in value-added or in employment as a proxy of the structural transformation process. As previously explained, Gaddis & Klasen (2014) criticised the studies that used GDP, proposing ‘sector-specific growth’ as an alternative variable to test the U-shaped hypothesis. However, they recognised that this variable might raise concerns among some researchers because it could be considered a noisy measure of the structural transformation process.

Due to the lack of consensus on this subject, my research proposes an alternative way to analyse the relationship between FLPRs and different stages of economic development. As stated above, Goldin (1994) implied that the proportion of jobs at the local level has an influence on FLPRs. She argued that in agricultural economies women participate in the labour market to a great extent, while in countries with a high percentage of jobs in industry, FLPRs decline. Finally, she argues that FLPRs rise again during the expansion of the service sector, as there is no social stigma attached to white-collar jobs.

Based on the previous explanation, my research considers that the percentage of jobs in each economic sector is an appropriate variable to capture both the structural transformation process and the different stages of economic development across time. This is in line with Perkins et al (2013) who argued that, at the lowest levels of income per capita, agriculture dominates both as a share of GDP and as a share of total employment. However, when the industry and the service sectors start growing, agriculture will account for a smaller share of both GDP and total employment.

In addition, I argue that sector-specific growth does not necessarily reflect the stage of the structural transformation process. For example, in a low-income country where most of the jobs are in the agricultural sector, there might be employment growth in the industrial sector at some point, but that does not mean that the industrial sector is more relevant than the agricultural sector. Therefore, my argument is that the structural transformation should also consider the size of each sector as a share of total employment.

To estimate the sectoral distribution of employment at the municipal level, I considered all individuals who reported being employed within each municipality, regardless of their sex. After doing this, I used the ‘expansion factor’ provided by INEGI to indicate the weight of each individual in the sample. More precisely, the ENOE household survey indicates that the ‘expansion factor’ can be interpreted as the number of units in the population that each unit in the sample represents. For instance, if a person in the sample is categorised as ‘non-economically active’ and their ‘expansion factor’ is equal to 308, this means that there are 308 people in Mexico that are non-economically active and share the same socio-demographic characteristics. Hence, ‘expansion factor’ is a variable that assigns a certain weight to each individual in the sample, and it can be used to obtain more precise estimations.

It is important to mention that the individuals interviewed in household surveys are selected through a random process and they also have different probabilities of selection. Hence, National Statistical Offices estimate the weight of each individual in the sample, which is equal to the inverse of the probability of being sampled. Omitting these sampling weights leads to biased estimates, which are far from the true values. Consequently, using sampling weights is useful to have a more precise estimation of the percentage of jobs in agriculture, industry, and services at the municipal level.

One of the main advantages of using the weight variable, is to have a more precise estimation of the people living in rural areas. Table 1 shows a comparison between the respondents from rural and urban areas in comparison with the estimations of the urban and rural population in Mexico after using the weight variable. The table shows that there is a higher proportion of respondents from urban areas than from rural areas. However, after using the weight variable the estimations show that there is a higher proportion of people living in rural areas than in urban areas.

**Table 1: Rural and urban respondents compared with rural and urban populations**



One of the main limitations of using the weight variable is that the ENOE survey is not representative at the municipal level, so the biggest municipalities are more likely to have a precise estimation of the sectoral distribution of employment, as they have a larger sample size. Meanwhile, the small municipalities will have larger measurement errors, as they have fewer respondents. Nevertheless, I addressed this concern to a certain degree by devising a novel approach. After estimating the percentage of jobs in agriculture, industry and services for each municipality in the sample, all the individuals who were surveyed in municipality “*x”* get the corresponding values of the sectoral distribution of employment in that municipality. Therefore, if they live in a small municipality, where only a few people reported having a job, the estimation may be less reliable, but their weight in the total sample will also be smaller. For instance, each ENOE survey considered for this analysis had more than 300,000 respondents. Thus a municipality with more than 8,000 employed individuals has 100 times more weight in the sample than a municipality where only 80 employed individuals answered the survey.

Despite recognising the innovation inherent in this empirical strategy, it is important to note that it is also a modest solution. Having a precise estimate of the sectoral distribution of employment at the municipal level would require the use of Small Area Estimation Methods, which is beyond the scope of this research. Nevertheless, I want to highlight the relevance of the weight variable to provide precise estimations of the sectoral distribution of employment. In the appendix I include three figures showing a comparison between the estimations of the sectoral distribution of employment at the state level during the first quarter of 2019 (Figures A5–A7). These include the official statistics published by INEGI, as well as my estimations using and not using the weight variable. These figures illustrate that, if the weight variable is not employed, the agricultural sector is underestimated, while the service sector tends to be overestimated. They also show that the estimations obtained using the weight variable are very similar to the official statistics published by INEGI. The figures demonstrate the utility of the weight variable at estimating the sectoral distribution of employment at the state level. Nonetheless, it is imperative to note again that the ENOE surveys are not representative at the municipal level.

## Econometric model

*Los siguientes párrafos deben especificar como se responderá la pregunta de investigación. Busca ejemplos que te ayuden de inspiración. Upasak recomienda que los parrafos 5, 6, 7 deben explicar informacion sobre tus datos, estrategia empírica y modelo empírico.*

Ejemplo del paper:

**Economic status of women in India: paradox of paid–unpaid work and poverty**

Design/methodology/approach – For addressing the above-mentioned issues, this study has used the data of 50th, 55th, 61st and 68th surveys conducted from 1993–1994 to 2011–2012 by National Sample Survey Office. In the first stage of analysis, the magnitude of unpaid work by women has been estimated. Subsequently, the relative contributions of socio-economic and demographics on the work status of women (paid and unpaid) in India have been assessed by using logistic regression model. In the second stage, the level of poverty among paid and unpaid women has been measured by using poverty estimation methodology. Furthermore, the incidence of poverty among unpaid women has been decomposed, and the contribution of socio-economic predictors has been measured.

As it was mentioned before, the main objective of this research is to analyze if there is a negative relationship between female labour participation and a high percentage of jobs in the industrial sector in local labour markets.

study is only analysing the current relationship between these

two variables is that it is only necessary to study a specific point in time.

One advantage of following this

que se siguió para poder realizar un análisis micro-econometrico, además de que incluye todos los detalles del modelo econométrico.

para poder emplear un análisis micro-econometrico, así como del

Para poder ejecutar el análisis econométrico, es necesario que la variable dependiente se equipare lo mas posible a los female labour participation rates. Para lograrlo, se tomo en cuenta la forma en que el INEGI y la organización internacional del trabajo calculan esta tasa, la cual muestra el porcentaje de la población mayor de 18 anios que es económicamente activa, en comparación con la población no

la base de datos a individuos mayores de 18 anios considerando una variable dummy que toma valor de 1 si la persona es económicamente activa y 0 otherwise.

Sin embargo, ninguna investigación ha evaluado si verdaderamente one of the underlying causes behind low FLPRs se debe a la que las mujeres no suelen participar en el sector industrial.

Esto indicaría que hay dos posibles explicaciones detrás de la baja participación laboral femenina en países de medianos ingresos con un alto porcentaje de empleos en el sector industrial. En algunos casos, la baja plf se debe a que en algunos países hay un estigma social muy fuerte contra mujeres trabajando en la industria. En otros casos, ciertos países de medianos ingresos no tienen un estigma hacia empleos de cuello azul, por lo que la baja participación laboral no se debe a un estigma hacia empleos en el sector industrial, sino a que hay una baja participación laboral femenina en el sector agrícola.

Además, se diferencia de estudios previos en esta área de investigación ya que propone una innovadora estrategia empírica en donde se emplea un análisis micro-econometrico, en lugar de realizarlo con series de tiempo.

La ventaja de estudiar una hipótesis especifica de la U-shaped relationship considerando un timeframe corto es que te permite hacer uso de microdatos, los cuales tienen un nivel de desagregacion que no se puede encontrar en estudios que utilizan series de tiempo, o que hacen comparaciones across-countries. Esto mismo lo menciona Klasen (XXX) quien menciona que seria interesante contar con un estudio que desagregue la participación laboral femenina en cada sector, ya que esto no es posible en cross-country studies.

Otro aspecto que diferencia a este estudio de investigación previas en esta área es que propone una forma alternativa distinta para estudiar la feminización U. En lugar de hacer uso de series de tiempo o datos agregados en un punto en el tiempo, este paper emplea un análisis microeconometrico

U-shaped relationship entre desarrollo económico y participación laboral femenina. Klasen (XXX) criticized those studies evaluating the hypothesis using GDP per capita because XXX. Instead, he proposes using sector-specific growth, aunque despues el mismo reconoce que esta medida es al menos igual de problemática que lo hecho anteriormente. Por lo tanto, the paper propone el uso de la variable 'sectoral distribution of employment' as an alternative measure to capture the different stages of economic development. This indicator is based on three variables that capture the percentage of jobs in agriculture, industry, and services as a share of the total employment in a given region.

Para lograrlo, propone dos variables de interés clave. La variable independiente

Adicionalmente estudio es que propone en lugar de utilizar series de tiempo, realiza un análisis micro-econometrico.

El modelo empírico para evaluar la hipótesis se divide en dos etapas. La primera etapa del analisis econometrico consiste en correr regresiones probit que muestren la probabilidad de que una mujer sea económicamente activa.

Por ultimo, este paper propone una innovadora estrategia empírica que se explica a detalle en la sección de metodología.

Los

Nuestra investigacion

utiliza las versiones extendidas del

primer trimestre de

investigacion utiliza cuatro repeated cross sectional datasets de 2005, 2010,

o answer the research question and address some of the criticism to previous studies on this research area.

Second, instead of using time-series data, the paper relies on micro-data obtained from Mexico's ENOE surveys, which are the main data source for estimating Mexico's labor market conditions. Third and last, instead of carrying out an economic history analysis to determine whether FLPRs were high when Mexico was an agricultural country, the original contribution of this paper is to show the current dynamics between FLPRs and the sectoral distribution within the country.

It is important to emphasise the last point. This study should not be considered an empirical evaluation of the U-shaped feminisation hypothesis in its entirety, since the paper is not undertaking a historical analysis of FLPRs when Mexico was an agricultural country. As previously mentioned, the study is based on micro-data from Mexico’s ENOE surveys available from the first quarter of 2005 onwards. According to World Bank data, the sectoral distribution of employment in Mexico during 2005 was 15% in agriculture, 26% in industry and 59% in services. Hence, this paper is just taking some theoretical underpinning of the female labour supply function in economic development to evaluate a specific hypothesis. This hypothesis indicates that in Mexico – a middle-income country with a high percentage of jobs in the industrial sector – one of the reasons behind low FLPR should be related to a social stigma towards married women working in blue-collar jobs.

Parrafo 6:

El modelo empírico para responder a la pregunta de investigación emplea un análisis microeconometrico considerando a los distintos individuos que contestaron las encuestas de hogares.

The dependent variable of the model is the binary variable “economically active”, which is used as a proxy of FLPRs and takes a value of 1 if they are part of the economically active population, and 0 if they are part of the non-economically active population.

The independent variables that capture the percentage of jobs in agriculture, industry, and services se utilizan como proxy de distintos niveles de desarrollo economico a nivel municipal en Mexico.

Los coeficientes obtenidos en las regresiones nos permitirán saber si un mayor porcentaje de empleos en el sector industrial a nivel municipal están relacionados con menor participación laboral femenina.

The empirical model to answer the research question utiliza micro-econometria y regresiones probit considerando a las distintas mujeres (y hombres) en el sample.

o evaluate the U-shaped hypothesis in Mexico, it would be necessary to have historical data on FLPRs when most of the jobs in Mexico were in agriculture.

Considerando esto,

con un alto porcentaje de empleos en el sector industrial.

se han tomado como hechos estilizados que automáticamente se trasladan a la realidad within-country.

En ocasiones se ha pensado que los resultados encontrados across-country o across-time significa que todas las hipotesis planteadas también se cumplen within-country en un specific point in time.

Las distintas hipotesis planteadas en la

Las distintas hipotesis planteadas se han tomado como hechos estilizados que automáticamente se trasladan a la realidad within-country.

Enhancing female labour force participation is essential for propelling both economic growth and economic development (XXX). Hence, having a clear understanding of the factors causing low FLPRs within a country is critical for crafting well-designed policies. One of the theoretical underpinnings of the U-shaped hypothesis is that in those places with abundance of industrial jobs, female tend to have the lowest probabilities to participate in the labour force. Nevertheless, there are no studies evaluating how the sectoral distribution of employment in local labour markets affects women’s likelihood of being economically active.

Los estudios que han estudiado la hipótesis realizando un análisis within-country a través del tiempo

han apoyado la hipótesis realizando análisis cross-country en un punto especifico en el tiempo.

Due to the lack of literature evaluating specific hypothesis of the U-shaped relationship

To answer the research questions this research present a

This paper answers the research question by conducting a brief cross-country analysis and an extensive within-country analysis using Mexico as a case study.

Taking the various U-shaped hypotheses as a stylized fact, it could be inferred that the low female labor force participation in Mexico is due to the high percentage of jobs in the industrial sector.

Due to the lack of literature studying how the sectoral distribution of employment in local labour markets affects female labour participation.

Most of the research in this subject has conducted its analysis using aggregated data from different countries and have found evidence to support the feminization U.

Due to the lack of literature studying specific hypotheses of the female labour supply function, this paper answers the previous questions using

Conclusión

This has led researchers to take the rest of the hypotheses that conform the U-shaped hypothesis as stylized facts that are fulfilled homogeneously within countries depending on their stage of economic development.

Without an empirical evaluation of the hypothesis, it could be inferred that the FLPR in Mexico one of the lowest in the region as it also has the highest percentage of jobs in the industrial sector.

Nevertheless, this paper shows que las regiones de México con un mayor porcentaje de empleos en el sector agrícola son las que muestran los niveles mas bajos de participación laboral femenina.

# Results

1er set de regresiones  
Hombres vs mujeres sin variables de control

2do set de regresiones   
Hombre vs mujeres con variables de control a nivel individual y hogar.

3er set de regresiones   
Solo mujeres.   
Variables de control a nivel individual, hogar y municipio y comparando…   
1) SDE sin interacción y 2) SDE con interacción SDE##SDE

4to set de regresiones – Robustness check  
Solo mujeres.   
Variables de control a nivel individual, hogar y región.   
1) SDE en 32 estados diferenciando zonas rurales y urbanas   
2) SDE en 32 estados diferenciando 4 tamanios de población (t\_loc)

5to set de regresiones – Robustness check   
Analizar la relacion a nivel municipal usando datos del censo 2010.   
El Censo 2010 si es representativo a nivel municipal.

# Exploratory Data Analysis

En esta sección vamos a poner

# Conclusion

While subsequent research may confirm that female labour force participation levels in Mexico were high during its agricultural era, decreased during its industrial boom, and have been increasing as the service sector has grown, my research reveals that the underlying reasons behind these patterns may be different from those outlined by theory.

Hence, this paper suggest than within Mexico there is an upward trend between FLPRs and different levels of economic development and labor force participation. In agricultural municipalities, female labor force participation is particularly low, in industrial municipalities female labor force participation increases, and in service sector-oriented municipalities, female labor force participation is even higher. This contrasts with what is currently observed in cross-country analyses that show a U-shaped relationship.

This descriptive paper is the first to provide an overview of the current relationship between female labour participation rates (FLPRs) and different stages of economic development within a country.

Most of the analysis in this research area have used aggregated data conducted its analysis using aggregated data considering different countries, and when finding evidence to support the hypothesis, it has been thought that the different aspects that generate the rise or decline of female labour participation are homogeneously fulfilled within the countries. Nevertheless, the U-shaped female labour supply function introduces numerous hypotheses that have been accepted as stylized facts without been empirically evaluated in within-country analyses. One of the hypotheses within the U-shaped theory indicates that FLPRs decreases significantly in middle-income countries with a high percentage of jobs in the industrial sector due to a social stigma towards women working in blue-collar jobs, especially if they are married. This paper evaluates this hypothesis by answering the following research questions: Do the regions of Mexico with a higher percentage of jobs in the industrial sector have the lowest female labour force participation rates? Do women living in regions of Mexico with a high percentage of jobs in the industrial sector have a lower likelihood of being part of the workforce?

Hence, the major contribution of this paper is that it can be considered a within-country study that offers an overview of the current dynamics between FLPRs and the sectoral distributions of employment commonly observed at different stages of economic development.

show the current trends on FLPRs in relation to the sectoral distribution of employment across Mexican municipalities.

on FLPRs in relation to the sectoral distribution of employment across Mexican municipalities.

Rather, it is the first study – to the best of my knowledge – to examine the current within-country patterns of FLPRs and different distributions of employment at the local level.

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2. Ph.D. Candidate in Development Policy & Management, Global Development Institute, University of Manchester, UK. [↑](#footnote-ref-2)
3. This indicator is based on three variables that capture the percentage of jobs in agriculture, industry, and services as a share of the total employment in a municipality. [↑](#footnote-ref-3)