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## STRATEGIES TO ACHIEVE TECHNOLOGY TRANSFER FROM FOREIGN COMPANIES TO LOCAL COMPANIES IN MEXICO TO INCREASE REAL INCOME AND EMPLOYMENT

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### ABSTRACT

This research examines strategies to enhance technology transfer from foreign companies to local businesses in Mexico to boost income and employment. Despite significant foreign direct investment (FDI), Mexico has seen limited improvements in wages and high-skill job opportunities. The study will find solutions to identified problems including the dominance of foreign firms, which contribute to these challenges. Using a combination of qualitative and quantitative methods, the research will collect data from 15 local and foreign companies, focusing on patent purchases, staff qualifications, and intellectual property charges. A Structural Equation Model (SEM) will be used to analyze the relationships between education, human capital, and firm performance in facilitating technology transfer. The findings will inform policy recommendations to improve local productivity, wages, and Mexico's competitiveness in the global economy.

### KEYWORDS

JEL Codes: O33, F23, F21, O40, O47, J31, E24, J21.

### INTRODUCTION

In this research, a study will be conducted to analyze the means through which technology transfer can be

effectively and optimally achieved to ensure that local companies in Mexico attain a higher level of



productivity, the capacity to compete in the industrial market and to become key players in the global market. More importantly, a major target is to ensure an increase in the income level of the populace in Mexico while generating more employment and elevating the citizens above the designation, job positions, duties and/or activities to which many are currently assigned or within the limit of their skillset and technological knowledge.

Several studies (Enrique, 2013; Garriga, 2017) have reached conclusions and reported an inverse relationship between wages and foreign direct investment in Mexico –sometimes marginal increase in low skill and no statistical effect on high skilled employees as reported in a study by Saucedo et al (2020) – since the bulk of the highest earning companies are high tech foreign companies that hire cheap labour in Mexico and have sufficient funds for capital-intensive production while concurrently applying innovations and rapidly changing technologies.

Manufactured exports are a major export-oriented strategy in Mexico with significant exports that contribute substantially to its economy. The exports encompass a wide range of goods, including machinery and transport equipment, steel, electrical equipment, chemicals, food products, and petroleum products. Notably, approximately four-fifths of

Mexico's petroleum production are being constantly exported to the USA.

Hence, the trade relationship between Mexico and USA is crucial to both countries as evident

in the NAFTA deal which started on January 1, 1994, which expanded export activities such that in 1995, Mexico's gross domestic product (GDP) stood at \$250 billion, constituting approximately 3.2 percent of the North American economic economy. In contrast, Canada's economy, valued at \$569 billion, made up a significant 7.3 percent of the total, while the United States represented GDP of \$6,952 billion, contributed the remaining substantial share of 89.5 percent to the overall North American economy (United Nations Development Program 1998, 182, 204, as cited in Cameron & Brian, 2002).

Currently, there are approximately 18,000 US companies in Mexico, and these include chemical industries, electronic companies, automobile companies, industrial and construction material producers, transport, retail and wholesale, mining and quarrying industries. Other major foreign companies originate from Germany, Spain, Japan, and Canada. Some other investing countries include China and Russia. A surge in the influx of Information, Communication and Technology –ICT companies has been recorded around 2000. According to World Bank data, foreign investment net inflow is 38.59 billion in



Mexico as of 2022. However, a reduction in the ICT service exports is observed, falling from 10.1% in 2000 to 2.3% in 2022 and this indicator represents computer and telecommunications, information services, postal and courier services, and information services.

In spite of the profile of Mexico as a viable environment for FDI, the income per capita has not received sufficient boost rather, minimum wage has been restricted to maintain the comparative advantage of cheap labour which appears to be the only negotiation power of Mexico. The possibility of a connection between this situation and the rate of tertiary education attainment along with skillsets cannot be ruled out. Also, determining the rate of technology transfer by the level of charges on intellectual property in Mexico is pertinent to drawing accurate conclusions.

Regardless, the ultimate goal of this research is to unravel other bargaining powers through which Mexico can strike better deals in the trading relationship with high income countries. Discussions on several factors necessary to achieve this goal will be found in the literature review such as the educational profile of Mexico. What are the market incentives in Mexico currently, are exports from local companies in Mexico higher skill content and technology content? When did Mexico start growing at a higher acceleration and what is the performance of rural township and village enterprises as well as

their nature if they exist? The literature review will present the answers to these questions including the topic of agglomeration in Mexico which is an important prerequisite for technology diffusion and industrial growth.

The discussions will be connected to existing studies and writings on China – an outstanding model of a country that accomplished the goal of technology transfer, experienced increase in individual income and ramped up the attainment of education and skills along with reforms and industrial policies that encouraged diffusion of technology and large-scale production.

## Problem Statement

This section discusses the economic issues that this research aims to address through solutions and recommendations. These issues include low wages and limited job advancement, the crowding-out effect of foreign companies on local businesses, the reluctance of foreign companies to invest further in the local environment, and the Mexican government's laxity in promoting knowledge transfer.

### a). Low Wages and Cadre

Workers in Mexico earn low wages in spite of the presence of foreign companies when compared to countries such as USA and China. A disproportionate



percentage of workers roughly 54.5% or more are working in low skill jobs.

According to the Mexico data, the official website of the Mexican government on economic statistics, workers in Mexico earn an average monthly salary of MXN3580 pesos –an equivalent of US\$211.22 (1 peso = 0.059 US dollars), the equivalent using Purchasing Power Parity conversion rate (PPP) is US\$344.98 in 2023. In contrast to the United States where the Median weekly earnings of full-time workers were \$1,100 in the second quarter of 2023 according to the US labour statistics data. Average monthly salary in Texas, a border state to Mexico is US\$ 4775.

Moreover, low skill jobs account for more than 30% of the workforce in Mexico which is disproportionately higher than the percentage of workforce employed as ICT specialists, electricians, engineers, scientists, researchers, and all other groups who are the most relevant group for the diffusion of technology and application in production. This category forms approximately 3.89%. Besides, there is a possibility that workers with the right qualifications are working in different job fields due to scarce hiring opportunities.

### **b). Competition against Local Companies**

Foreign companies with established production and distribution techniques, along with a steady flow of funding to maintain capital intensive production or

expansion have the tendency to compete effectively against local companies that have only recently acquired factors of production and technology transfer through available means. With the capacity to produce high quality goods and capital to maintain large scale production, the competition for the consumer market will be a landslide as well as the factor market through which supply of materials as well as resources for production are purchased.

### **c). Capital Flight**

Foreign investors are highly likely to send their profits back to their originating countries in form of savings. Basically, they can make any decisions with their profits such as purchasing new technology from research centers and teams with which they can create joint ventures, paying for licensing agreements and partnerships in any other location. Moreover, profits can be used to boost the wages of workers in their homeland companies rather than investing them in Mexico or increasing employment and income.

### **d). Insufficient efforts to ensure technology transfer by the Mexican government**

A publication by the Secretaría de Economía confirms that the government has only recently started gearing efforts towards revamping the curricula in the relevant areas of study, creating specialties according to types of industries that bring investments into the



currently to ensure supply of required talent (Secretariate de Economia, 2023).

Existing strategies such as the linking of universities to companies set up by the government may have inherent problems as pointed out by Puerta-Sierra & Jasso (2020); reasons such as organizational factors deter desirable outcome because researchers observed a poor management of knowledge and technology transfer. They reported insufficient information about the functions of the Technology Transfer Office (TTO) relating to the commercial value of research output and licensing, and intellectual property rights.

Furthermore, other negative factors reported by researchers that impede a concrete partnership with the industries are the lack of internal and external funding and bottle neck bureaucracy, geographical distance among other factors.

### 1.3 Research Questions

The research aims to explain how income growth can be achieved by optimizing the presence of foreign corporations in Mexico and to identify Mexico's potential and to find the leverage Mexico can employ to strike better deals for technology transfer.

I. Is the level of education and skills among the Mexican labour force sufficient to attract higher wages in high tech companies?

II. What is the existing rate of technology transfer between Mexico and foreign companies based on the account of charges on intellectual property?

III. What other bargaining leverages can be explored to attain higher technology transfer to local companies in Mexico?

### 1.3 Objectives

General objective of this study is to detect the factors contributing to the stagnation of wage growth in the presence of foreign corporations in Mexico and to identify Mexico's potential negotiation strengths to facilitate technology transfer from foreign companies.

I. To determine if the current skillset and education attainment in Mexico is sufficient to attract higher wages in high tech companies.

II. To ascertain, through qualitative and quantitative analysis, the current rate of technology transfer between local companies and foreign companies in Mexico based on the charges on intellectual property in Mexico.

III. To identify more efficient leverages with which Mexico can negotiate for faster transfer of technology to local companies, students, and workforce in the country.

### 1.4 Hypothesis of Study



Ho : The rate of charges for the use of intellectual property payments and receipts does not imply the progress of technology transfer in Mexico.

HA: The rate of charges for the use of intellectual property payments and receipts imply the progress of technology transfer in Mexico.

### 1.5 Justification of the Study

A number of countries that have developed through the inflow of foreign direct investment have undergone the process of rural to urban migration sector as described by the Lewis Two Sector model, however, a significant rise in wages have occurred. According to Todaro & Smith (2015), before the 1980s, an important feature of urban job markets and how wages were set in nearly all developing nations was the consistent increase in wages.

This increase occurred over time, and it was both in terms of the actual wage amounts and in comparison to the average incomes in rural areas. This trend persisted even as the number of people unemployed in the modern sector was rising, and agricultural productivity in rural areas remained stagnant or declined. Institutional factors, such as the strength of labour unions, the wage levels in the civil service, and the hiring practices of multinational corporations, tended to offset the influence of competitive market forces in the labour markets of the modern sector in developing countries.

However, foreign direct investment has, although grown increasingly since 1975 in Mexico and the presence of many Maquiladoras is a proof of the establishment of manufacturing plants and factories, a large percentage of Mexican workers remain low-income earners or occupy low rank job positions in these establishments.

In addition, charges for the use of intellectual property have grown over the years from US\$280 million in 2012 to US\$1.71 billion in 2022 according to World Bank data; this increase could signify an increase in technology transfer or in the value of the intellectual property acquired by local companies. If adequate technology transfer is occurring, there should be a direct impact on the output and exports from local companies, also on the capacity of such local companies to hire more labour either low or high skill with an observable impact on wages. However, this impact and benefits are not clearly observable in the economy of Mexico. Therefore, a thorough investigation is necessary to ensure concrete growth and development is truly occurring in Mexico.

Local companies in Mexico have not exhibited adequate absorption of technology, innovation and techniques, the capacity to compete globally at a close level with reputable companies that command a large share of the global market. This should be a cause for concern based on the profile of Mexico as a country with a commendable level of competitiveness



in regard to the presence of infrastructure, accessible roads, electricity among others.

Therefore, it is imperative to create strategies through which Mexico will experience the full benefits of foreign direct investment rather than the disadvantages such as capital flight.

## LITERATURE REVIEW

In this section, discussions are presented on the current characteristics of the labour force of Mexico; the population of individuals who are economically active and participate in labour. Characteristics such as level of education attainment, category of occupation and level of income (wages). As the research progresses, the discussion on Intellectual Property Protection (IPR) law in Mexico and the effectiveness of its enforcement.

Previous works in the topic of technology transfer such as Branstetter, Fisman and Foley (2006) on how IPR law reforms could be a determinant factor in encouraging foreign multinational to transfer patents and more trade secrets to local companies and even invest more in Research and Development (R&D) and sell the knowledge off to local companies in turn. The study covered 16 countries that implemented IPR reforms between 1982-1999. It also tried to unravel the questions surrounding how changing prices of patents might not represent the volume of

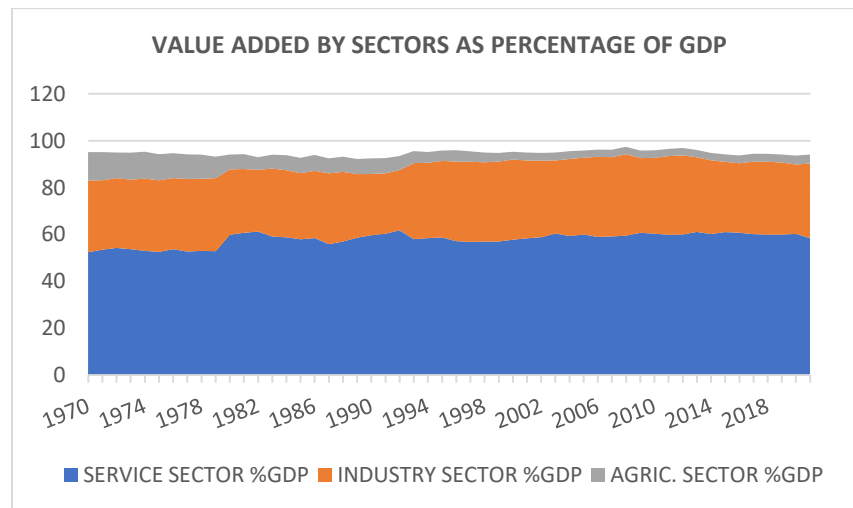
technology transfer and therefore incorporated spending of parent companies on R&D in the regression analysis.

Further discussions will entail the experiences in countries that rapidly achieved growth and development through technology transfer with emphasis on China as a case study.

### 2.1 Labour force participation and Structure in Mexico

Efforts have been made throughout the past years by the Mexican government to boost education, skill acquisition and vocational training for the purpose of achieving growth such that government expenditure on education between 1970 to 2018 reached a peak at \$US69.19 billion in 2014 for all levels of education and by 2016, a significant rise in tertiary enrolment occurred at 27% rate of increase, secondary enrolment increased by 5.6% but primary enrolment reduced by -2.4%. The outcome of primary, secondary and tertiary in the labour market in Mexico can be seen in the number of labour force participation among the three levels of education attainment on Fig. 2 and the data obtained from the World Bank on the value added to gross domestic product by the various sectors of the economy in Mexico on Fig. 1; the industry, agricultural and service sector shows that the service sector contributes the largest part of Mexico's GDP.

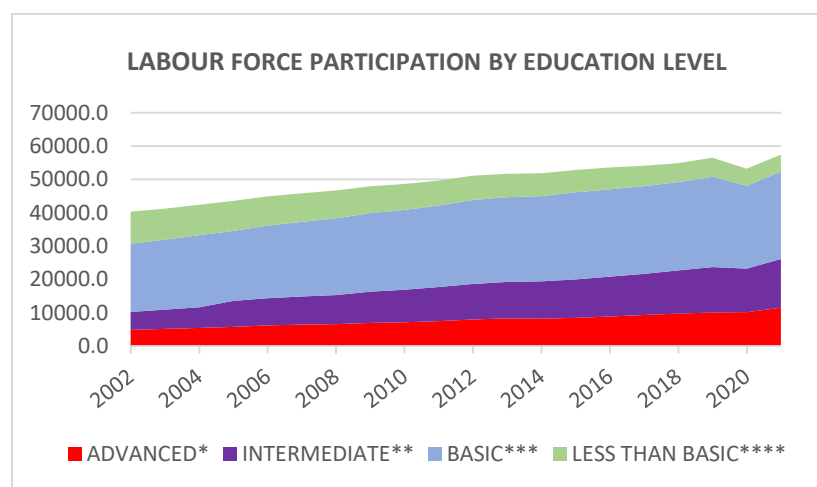
Fig. 1



Source: author, data compiled from World Bank

As shown on Fig. 2, individuals with secondary education comprises the largest portion of the labour force while Fig. 3 indicates that the service sector is the highest employer of labour and this infers that a large portion of secondary school holders are employed in the service sector as well as other sectors and generate a large portion of the GDP and hence, GNI.

Fig. 2



Source: author, data compiled from International Labour Organization, 2022.





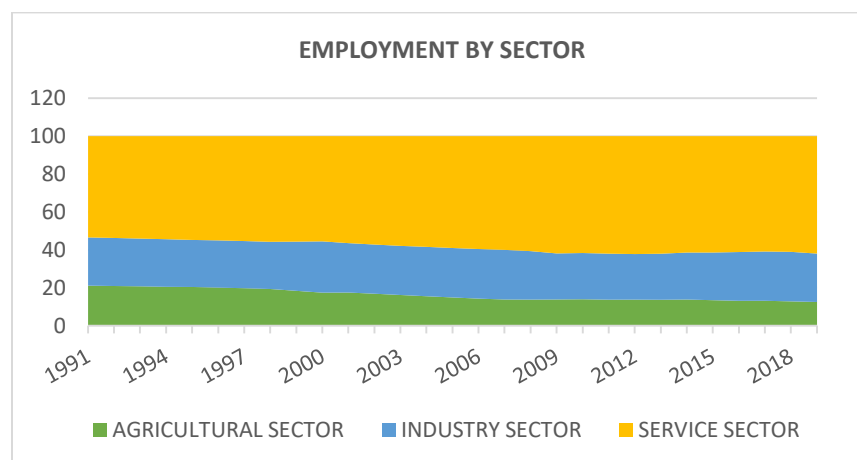
**\*Advanced:** first stage of tertiary education (not leading directly to an advanced research qualification) and Second stage of tertiary education (leading to an advanced research qualification).

**\*\*Intermediate:** upper secondary education.

**\*\*\* Basic:** Lower secondary (or second stage of basic education) and primary education (or first stage of basic education).

**\*\*\*\*Less than basic:** No schooling and pre-primary education.

Fig. 3



Source: author, data compiled from World Bank website.

Regardless of the analysis above, based on the latest report on monthly wages of Mexico workers in the second quarter of 2022, the highest earners among workers fall into the category of Directors of Surveillance and Security Services followed by Directors and Managers in Health Services, Civil Protection and Environmental with a monthly wage (Mexican pesos) within the range 32400≥W≥26400, they form only 0,05% of the total workforce and are

perceived or expected to have attained tertiary education.

The next group of high earners fall within the range 25800≥W≥24800 and comprises of Supervisors, Artisans and Workers in the Processing and Manufacture of Metal, Workers in Renting Movables (Crockery, Movies, Video Games, Etc.), Directors and Managers in Construction, Repair and Maintenance, they compose the 0,073% of the workforce and are



likely to be a mixture of secondary and tertiary education holders.

The third group of high earners are Brass workers, Painters and Metal Cobreros, Agronomists, Funeral Directors and Managers and other Services, Directors and Managers in Research and Technological Development, Appraisers, Auctioneers and Auctioneers and are within the range 21020 ≥W≥18000. This group is clearly a juxtapose of people with advanced education, secondary, primary and people with no schooling at all.

The fourth group falls within the range of 17000 ≥W≥13000 and the occupation in the category include Assistants and Technicians in Construction and Architecture, Electrical Engineers, Technicians in the Installation, Repair and Maintenance of Refrigeration Equipment, Climates and Air Conditioning, Installers of Insulating Material, Waterproofing, Glass and other Materials, Support Workers in the Electrical Industry,

Electronics and Communications, Supervisors of Electrical Technicians, Electronic and Telecommunications Equipment and Electromechanical, Industrial Engineers, Supervisors and Workers in Personal Care and Household, Coordinators and Department Heads in Museums, Cinemas, Sports and Cultural Services (Data Mexico, 2022). The group is likely to be comprised mostly of people with vocational education, also people with secondary and tertiary education. The job roles are in many cases carried out by individuals who have attained tertiary education but work in the same capacity as individuals with secondary education.

The full details of the categories and monthly wages of all categories of workers can be found on the link [Monthly Wages of Workers by Category, 2022 Q2](#). The summary of monthly wages in Mexican pesos of occupations across various categories are shown on Table 1.1.

**Table 1.1 Average Monthly Wages Among Categories of Occupation in Mexico**

	Category								
	AAAW	CW	IMOADTD	ODH	PT	TESSA	WALFHF	WESA	WPSS
	Mean	Mean	Mean	Mean	Mean	Mean	Mean	Mean	Mean
Monthly Wage	5952,09	8030,31	6693,36	10829,32	8289,45	7607,60	5754,10	5951,53	6908,22
Percentage	0,0080	0,0003	0,0016	0,0009	0,0022	0,0032	0,0003	0,0119	0,0209



IMOADTD => Industrial Machinery Operators, Assemblers, Drivers and Transport Drivers, Source: author, data compiled from Data Mexico, 2022

WALFHF => Workers in Agriculture, Livestock, Forestry, Hunting and Fishing

TESSA => Traders, Employees in Sales and Sales Agents

AAAW => Administrative Activities Auxiliary Workers

WESA=> Workers in Elementary and Support Activities

ODH =>Officers, Directors and Heads

PT=> Professionals and Technicians

CW => Craft Workers

The deduction from the illustrations and categorisations above is that there is no clearly defined or distinguished difference in the wages earned by tertiary workers and the job roles of tertiary education holders in comparison to primary and secondary education holders.

The literature review will be expanded further to include various empirical results in previous studies as the research continues.

## THEORETICAL REVIEW

The related theories are classified under the endogenous growth model which includes a set of theories developed by various proponents. These theories outline the interactions among different production factors to facilitate increased output. In this context, output is synonymous with economic growth. Notably, human capital, considered as an integral part of this growth, has played a pivotal role in the countries under examination. Within the endogenous growth model, economic expansion hinges on the specific characteristics of the economic environment. This framework takes into account

sustained technological advancements and increased productivity. Without these two crucial factors, the growth trajectory would eventually encounter limitations due to diminishing returns on capital and labour.

One illustrative example is the AK paradigm, which emphasizes that to maintain high growth rates, a substantial portion of GDP must be saved. These savings are then channelled into funding further technological progress, thereby accelerating economic growth (Aghion & Howitt, 2009).

Romer's (1990) product-variety model, is an “innovation-based” growth model, in which innovation fosters productivity growth by introducing new product varieties, even if these varieties may not necessarily represent improvements over existing ones. This paradigm evolved from the emerging field of international trade theory and underscores the significance of technology spill overs.

In the model, the degree of product variety represents the economy’s aggregate productivity



and its growth rate signifies the per capita output growth in the long run within the economy. A higher degree of product variety enhances the economy's capacity for production because it permits the allocation of a fixed capital stock across a greater number of applications. Each of these applications experiences diminishing returns over time. Therefore, an increase in product variety is the key driver that sustains growth in this framework.

The emergence of new product varieties, essentially innovations, results from investments in research and development (R&D) made by entrepreneurial researchers. These individuals are incentivized by the potential for long-lasting monopoly profits should their innovations prove successful.

In the Schumpeterian Model, each intermediate product is exclusively produced and sold by the latest innovator. When an innovator succeeds in a certain sector, they enhance the technology parameter, displacing the previous product until the next innovator takes its place. As a result, one of the primary implications of the Schumpeterian paradigm is that faster economic growth typically leads to a higher rate of firm turnover. This dynamic process, known as creative destruction, involves the entry of new innovators and the exit of previous ones.

In this model, innovation depends on two main inputs: private expenditures made by potential innovators and the stock of innovations from past innovators, which constitutes the publicly available knowledge base for current innovators. This theory accommodates different scenarios for the contribution of past innovations. It can represent cases where an innovation significantly advances existing technology or cases where innovation catches up to the global technology frontier, which represents the global technological knowledge

available to innovators in all sectors and countries. In the latter case, the innovation typically involves implementing or imitating technologies developed elsewhere.

Schumpeterian theory recognizes that the growth effects of various policies are context-dependent, as innovations can interact differently based on country-specific factors. It provides a framework to analyse how a country's growth performance is influenced by its proximity to the technological frontier, how it tends to converge toward that frontier, and what policy changes are necessary to sustain convergence as the country approaches the frontier. However, Schumpeterian theory determines innovation frequencies endogenously by considering the profit-maximization problem faced by prospective innovators. This problem and its solution depend on institutional characteristics of the economy, such as property rights protection, the financial system, and government policies. Moreover, the equilibrium intensity and mix of innovation often rely on institutions and policies, with variations based on the country's distance from the technological frontier.

In the Lewis model, an underdeveloped economy is divided into two sectors: a traditional, densely populated rural sector where labour has zero marginal productivity, meaning that labour can be withdrawn from this sector without affecting its output, and a modern, high-productivity urban industrial sector where labour from the rural sector gradually transitions. The main focus of this model is on the process of shifting labour and the growth of output and employment in the modern sector, which we'll refer to as the "industrial" sector for brevity. The movement of labour and growth in the industrial sector are driven by its output expansion.



The rate at which this expansion occurs is determined by the level of investment and capital accumulation in the modern sector, made possible by the surplus of profits over wages, assuming that capitalists reinvest all their profits. Additionally, Lewis assumed that wages in the urban industrial sector remain constant and are set as a fixed premium above a standard subsistence wage level in the traditional agricultural sector. The model also posits that the supply of rural labour to the modern sector is perfectly elastic at this constant urban wage.

However, when we consider factors such as the labour-saving nature of modern technology transfer, significant capital flight, the decreasing presence of surplus labour in rural areas, the growing surplus labour in urban settings, and the tendency for wages in the modern sector to rise rapidly even in the presence of substantial open unemployment, we must recognize that the Lewis two-sector model, while useful in illustrating early development processes, requires significant adjustments in assumptions and analysis to align with the realities of most contemporary developing nations (Todaro & Smith, 2015).

## METHODOLOGY

### Scope of the Study

This study focuses on both local and foreign companies operating in Mexico City, one of Mexico's primary business hubs. The city hosts a wide range of foreign brands across various sectors, including automotive, confectionery, medical technology, and hospitality. The parent companies are from highly developed regions such as the United States, Spain, Japan, and China. The number of registered foreign companies in Mexico City is at least 844 while Mexican companies with foreign investment in their share capital as of August 23, 2024, is recorded to be over 3,145,507. The website Data Mexico accounts for 193, 423 small businesses in Mexico City.

Covering a 13-year period from 2010 to 2023, the study will compile government policies, laws, and reforms on Intellectual Property Protection (IPR) relevant to local and foreign companies in Mexico City within this timeframe.

The sample size is determined based on the formula:

$$n = \frac{n}{1 + \frac{z^2 * \hat{p} * (1 - \hat{p})}{\epsilon^2 * N}}$$

where n is the Cochran's recommended sample size = 365, z is the z-score = 1.96,  $\hat{p}$  is the population proportion = 50% or 0.5,  $\epsilon$  is the margin of error = 0.05, N is the population size = 844 (foreign companies), and 3,145,507(local companies).

Hence the sample size of foreign companies for data collection will be 250.83, while the sample size of local

companies will be 364.96, the total sample size will be 615.79  $\approx$  616.

### COLLECTION OF DATA

The data collection will be achieved by administering questionnaires to 251 local companies and 616 foreign companies in Mexico City. The questionnaires to be



administered to local companies should gather key information on various aspects of their operations and affiliations. Essential data includes details on the purchase of patents from parent or multinational companies, such as prices, payments, and the dates of these purchases. Additionally, information on staff members in production and IT departments is crucial, including their field of study, professional certifications, level of education, and source of education. The questionnaires should also cover previous salaries within the company, the company’s profit size, and specific data on affiliated foreign companies.

For foreign companies, the questionnaires should focus on similar details regarding staff in production and IT, specifically their educational background, certifications, and source of education. It is also important to gather data on the companies' research and development (R&D) expenditure, patent sales, and information about affiliated local companies, including the year their contract was established. Collecting these data points will provide a comprehensive understanding of the transfer of knowledge, skills, and resources between local and foreign companies. The survey will cover companies from the listed industries on Table 4 depending on accessibility and availability.

**Table 1.2 List of Industries**

Agriculture	Automotive Manufacturing	Aerospace	Banking and Finance
Biotechnology	Chemicals	Construction	Consumer Electronics
Energy (Oil and Gas)	Entertainment & Media	Environmental Services	Food and Beverage
Healthcare and Pharmaceuticals	Mining and Metals	Information Technology (IT)	Internet and E-commerce
Manufacturing	Petroleum Refining	Music and Recording	Retail
Packaging	Textiles & Apparel	Biomedical	Utilities (Water, Gas, Electricity)
Telecommunications	Automotive Retail	Consumer Goods	Dental Care
Aerospace and Defense	Computer Hardware	Medical Devices	Green Technology
Clean Energy	Financial Services	Environmental Technology	Forestry and Lumber

**Model Specification**

The SEM model can be used to analyse how various factors such as human capital, innovation, education source, and affiliation with foreign companies

influence company performance and patent-related activities. Fig. 4 is an illustration of a Structural Equation Model where there is more than one dependent variable.



**DEPENDENT AND INDEPENDENT VARIABLES:**

Dependent variables in the study (Endogenous):

- A. Profits in local and foreign companies (SoP)
- B. Wages of workforce in local and foreign companies (CS)

**Local Companies:**

**1. Staff Members:**

- Field of Study (FS): The field of study of staff members in the production and IT departments.
- Professional Certificate (PC): Whether staff members have professional certificates.
- Level of Education (LE): The educational level of staff members.
- Source of Education (SE): The source of education for staff members (e.g., local universities, foreign universities).
- Previous Salaries (PS): The previous salaries of staff members within their companies.

2. Size of Profits (SoP): The size of profits earned by local companies.

3. Prices of Patents (PoP): The prices paid by local companies for patents.

4. Payment on Patents (PoPa): Payments made by local companies for the use of patents.

**Foreign Companies:**

**1. Staff Members:**

- Field of Study (FS): The field of study of staff members in the production and IT departments.

- Professional Certificate (PC): Whether staff members have professional certificates.
- Level of Education (LE): The educational level of staff members.
- Source of Education (SE): The source of education for staff members.

2. Size of Profit (SoP\_F): The size of profit earned by foreign companies.

3. Companies' Expenditure on R & D (RD): The expenditure of foreign companies on research and development.

4. Companies' Sales of Patents (SoP\_P): The number of patents sold by foreign companies.

**Hypothetical Pathways and Model Components**

Pathways for Local Companies

1. Educational and Professional Attributes of Staff Members (FS, PC, LE, SE) → Wages (CS) → Profits (SoP) → Wages (PS, CS) ← Patent Purchase-Related Factors (PP, PoP, PoPa, DoPP) ← Patent Payments (PoPa).
2. Educational and Professional Attributes of Staff Members (FS, PC, LE, SE) → Expenditure on R&D (RD) → Patent Sales (SoP\_P) → Profits (SoP\_F) → Wages.

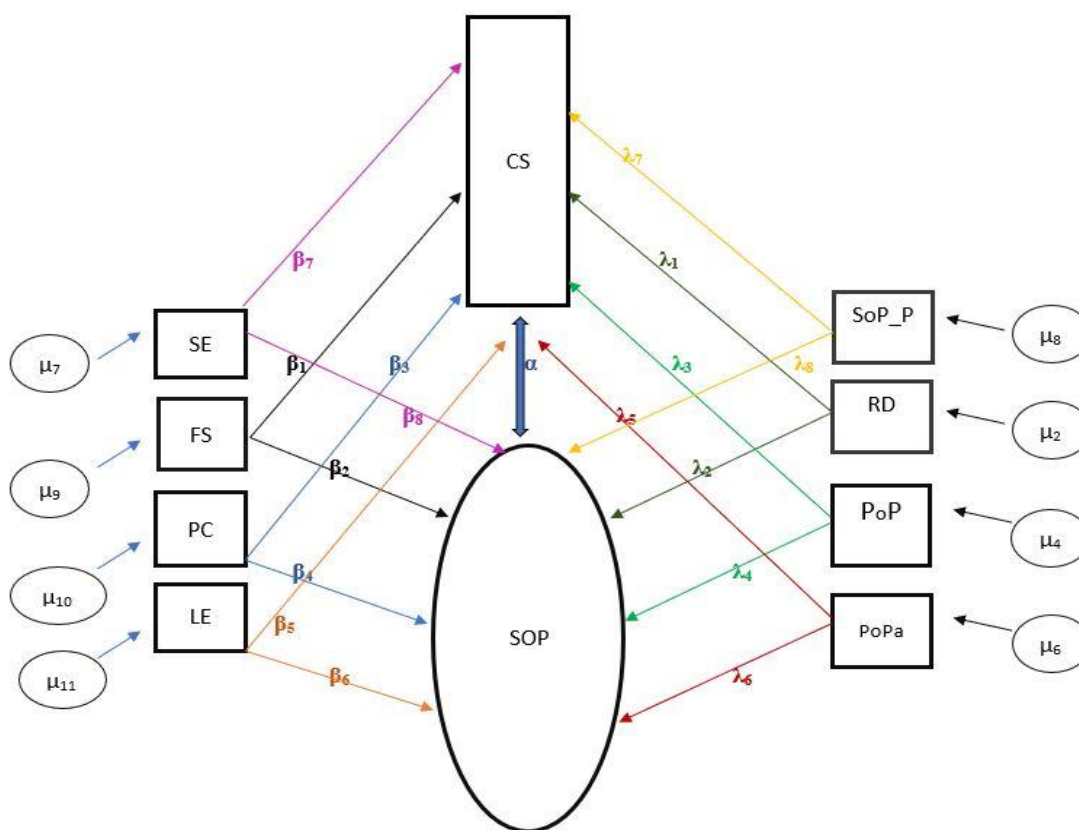
Fig. 4 is an illustration of the structural equation model for the pathways or interrelationship between the independent variables and dependent variables. The lines with arrows and parameter estimates represent the direct effect of each independent variable on the dependent variables. The standard

software for generating graphic pathways include the Amos (Analysis of Moment Structures) on SPSS or Mplus (Keith, 2019). Additional components of the structural SEM are usually the latent variables (or disturbances) in the ovals which represent unmeasured variables or unobserved variables that predict exogenous variables in the model. The paths beside the ovals simply set the scale of measurement for the disturbances. Unmeasured variables do not

have a natural scale, hence the scale can be set to any number but 1 is often used, this will then mean that the SEM program should set the disturbance to have the same scale as the other variables.

Lastly, an important aspect of the research will involve a compilation of laws and reform will be gathered from government publications and literature to understand or determine their impacts on the industrial and service sectors in Mexico.]

Fig. 4 Structural Equation Model



Source: Designed by author





## CONCLUSION

The proposed research aims to address one of the critical challenges facing Mexico's economy: the limited impact of foreign direct investment (FDI) on local wage growth, employment, and technological development. By analyzing how technology transfer from foreign companies to local businesses can be optimized, the study will provide valuable insights into strategies that can elevate Mexico's productivity, enhance its global competitiveness, and ensure a more equitable distribution of the benefits from FDI.

This research also seeks to identify ways to reduce the dominance of foreign companies in key sectors and promote the growth of local firms through improved technological capabilities and innovation. By investigating factors such as intellectual property charges, educational attainment, and labour skillsets, the study aims to offer a framework for policymakers to enhance bargaining power in trade and investment negotiations. Ultimately, the findings are expected to guide Mexico in fostering sustainable economic growth, boosting real income, and increasing employment opportunities in high-tech industries.

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