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Economic structure and employment in Mexico: Proposed analysis for public policies

Estructura económica y empleo en México: propuesta de análisis para políticas públicas

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Abstract

The levels of employment in a society are an issue of utmost importance on which public policies should focus. In the perspective of the labor market, the literature has agreed that the best results are obtained with an adequate design of the programs, for which it is important to define the objective to be achieved and additionally establish a diagnosis of the economic structure and the interrelationships that occur between subsectors and that pay for the direct and indirect generation of employment. In this sense, the present research through the analysis of the Input-Product Matrix offers evidence that the subsectors of the food industry, building, agriculture, food and beverage preparation, transport equipment, construction of civil engineering works, manufacture of clothing and animal husbandry and exploitation are the ideal ones to propose a labor policy given their capacity to generate employment.

JEL Code: C67, E24, L80
Keywords: input-output matrix; labor market policy; Mexico

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Resumen

Los niveles de empleo en una sociedad son un tema de suma importancia sobre los cuales se deberían de enfocar las políticas públicas. En la perspectiva del mercado laboral la literatura ha coincidido en que los mejores resultados se obtienen con un adecuado diseño de los programas, para lo cual es importante definir el objetivo que se quiere lograr y de forma adicional establecer un diagnóstico de la estructura económica y las interrelaciones que se dan entre subsectores y que abonan a la generación directa e indirecta de empleo. En este sentido, la presente investigación mediante el análisis de la Matriz Insumo-Producto ofrece evidencia de que los subsectores de la industria alimentaria, edificación, agricultura, preparación de alimentos y bebidas, equipo de transporte, construcción de obras de ingeniería civil, fabricación de prendas de vestir y cría y explotación de animales resultan ser los idóneos para proponer una política laboral dada su capacidad generadora de empleo.

Código JEL: C67, E24, L80
Palabras clave: matriz insumo-producto; política en el mercado laboral; México

Introduction

The main objective of economic and social policies is to increase the employment component of economic growth. Policymakers can generate strategies to achieve this objective in a context where the relation between growth and the creation of quality jobs is weakening. In this regard, the International Labor Organization (ILO) points out that the experience acquired at the national level can contribute to constructing a common international framework, which requires the formulation of diagnoses to design a national employment policy that considers references from other countries.

In the case of Mexico, economic growth problems have increased unemployment, accentuating the labor gap. Therefore, the government must focus its efforts on supporting the sectors most closely linked to the economic structure to respond to the employment needs of the population. Given this environment, it is necessary to construct indicators that show the interrelationships of the economy and contribute to decision-making to develop employment policies.

In this context, the proposed analysis to identify the connectivity of the different economic activities that can boost employment is based on Leontief's open model, which considers economic relations and their link to final demand. In this way, it is possible to differentiate, from the total number of employed personnel registered in each economic activity, how many are direct jobs and how many are indirect jobs attributable to intersectoral linkages. These estimates and the construction of indicators will be carried out at the subsector level, which implies a broader network of relations between economic activities. The appropriate estimators for this purpose are the direct and indirect employment coefficients and the calculation of employment-product elasticities, which show the subsectors with the greatest impact on total employment in the face of changes in their demand. In addition, inter-industrial linkages are

incorporated into the analysis to classify the subsectors as key, strategic, driving, or independent as an additional characteristic to the proposed analysis.

Following up on the research agenda initiated by Arriaga et al. (2021), this document analyzes and quantifies employment based on Mexico's economic structure at the subsector level, showing a more disaggregated connection level between economic activities. Indicators such as direct and indirect employment coefficients and the calculation of employment-output elasticities are estimated based on the input-output model. Likewise, the subsectors are classified as key, strategic, driving, or independent as a characteristic of the level of connectivity of the economy and its capacity to generate employment. In addition to the introduction, the paper is composed of three sections: in the second, the theoretical approach and literature review; in the third, the methodological analysis for the productive interrelation of employment; and in the third, the analysis of results with a structural analysis of employment, ending with a conclusion on the subject.

Theoretical approach and review of the literature

Labor market policies

From the perspective of Keynesian thought, the idea of full employment is an objective that is not satisfactorily achieved by the market (Davidson, 2001). Meanwhile, according to Toporowski (2018), one of the most important contributions to political economy of Kalecki's wartime work was related to the political aspects of full employment and the restrictions that are established in a capitalist system where unemployment is an integral part of a normal capitalist system, so if at some point capitalism coincides with full employment that will be fundamentally different capitalism. Lerner, who coined the idea of functional finance (1943, 1944), assumes that the counterpart of inflation has to do with unemployment and assigns an important role to the action of the State as a regulator of spending that permits equilibrium in the economy. Likewise, under the theoretical umbrella of functional finance and some post-Keynesian principles, Modern Monetary Theory (MMT) also supports using monetary and fiscal policy to achieve employment objectives. As stated by Wray (2020), MMT favors spending aimed at achieving full employment, even though, according to Pérez and Vernengo (2020), attention must be paid to the peculiarities of the labor market in developing countries, such as structural or hidden unemployment.

In public policies related to the labor market (LMP), an important division has to do with how much the government intervenes in the labor market. Accordingly, a difference is made between active and passive policies (ALMP and PLMP, respectively) (see Table 1), where the difference in the objective

pursued is that passive policies aim to protect the needs produced by the lack of employment. In contrast, active policies balance labor supply and demand to reduce or eliminate unemployment (Álvarez, 2016).

Table 1
Classification of interventions by type of action

Labor market policies (LMP)	Description
Active Labor Market Policies (ALMP)	
Public employment service and management	Includes the various services and activities designed to help staff recruit job applicants and absorb the unemployed into the labor market.
Training	It aims to improve the skills of the target groups through face-to-face training measures and on-the-job training.
Employment incentives	Subsidies granted in the ordinary market; jobs that can be subsidized are often in the private sector.
Supported employment and rehabilitation	Integration of people with reduced working capacity into the labor market by providing employment support and rehabilitation.
Direct job creation	Aims to create additional jobs for the long-term unemployed or those facing particular difficulties in the labor market.
Start-up incentives	Encourage the unemployed and other target groups to start their businesses to become independent entrepreneurs through direct cash benefits, loans, and business consultancy.
Passive Labor Market Policies (PLMP)	
Maintenance and support of unemployment income	Compensating individuals for lost wages or salaries through unemployment benefits, partial unemployment benefits, part-time unemployment benefits, severance pay, and bankruptcy compensation.
Early retirement	Refers to all cash expenditure, including lump-sum payments, for retirement and survivors' pensions, and also includes conditional and unconditional early retirement.

Source: created by the authors with information from Shanoun and Abdennadher (2018)

Martínez (2008), based on a review of other authors, points out that the difference between active and passive policies is that the latter focus on an income substitution component of transfers whose objective is to maintain the income of the unemployed, while the former aim to establish a process of integration into the labor market so that while the logic of passive policies is to protect, compensate or indemnify, the objective of active policies is to achieve the participation or activation of people in the labor market. A trend seems to be emerging in favor of active policies over passive ones, given that PLMPs can generate perverse incentives by discouraging job search (Bucheli, 2005). Vooren et al. (2019) additionally mention that passive policies such as unemployment benefits can be more costly, in addition to the fact that they cannot shorten the gap between needs and skills that is achieved by ALMPs through programs such as training; additionally, they also favor employment and avoid the loss of income and the depreciation of human capital that is amplified as the worker becomes inactive.

In practice, the average spending on ALMP in OECD countries has been around 0.5% of their GDP, which has remained relatively stable and, at the same time, counter-cyclical since in the two moments of crisis occurring between 2004 and 2020, spending showed an increase, while in the case of the PLMPs, there was a greater increase in the setbacks and a more marked reduction than in the active policy, which shows its function as an automatic stabilizer (Figure 1). Also noteworthy is the increase in spending in 2020, which would be expected to return to levels similar to those of 2008 or 2018 as the economy recovers.

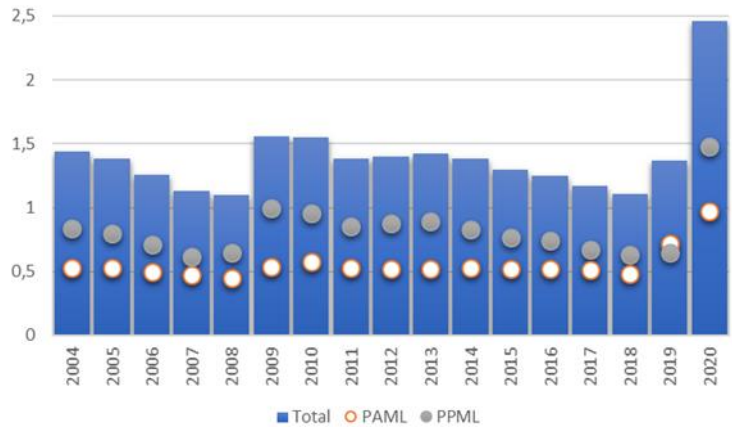

Figure 1. Spending on Assets and Liabilities in the labor market (%GDP)
Source: created by the authors with OECD data

On the other hand, Figure 2 provides information regarding expenditures made in 2018[1] by the OECD countries. In principle, only 9 countries of the total spending on LMP—more than 50%—is allocated to ALMP. Denmark together with France are the countries that allocated the largest number of resources to LMP, while the United States and Japan were the ones that allocated the least resources to that purpose. In the case of Mexico, although constitutionally, it establishes a broad reference to the issue of labor and social welfare,[2] in practice from 2004 to 2016 it allocated less than 0. 01%. Subsequently,

[1] It was decided to work with 2018 data so as not to generate a distortion in the distribution of spending between ALMPs and PLMPs, given the pandemic situation.

[2] In the Political Constitution of the United Mexican States, the entire Sixth Title is devoted to Labor and Social Welfare, where Art. 123 indicates that "Every person has the right to dignified and socially useful work; to this end, the creation of jobs and the social organization of work will be promoted, following the law." Nevertheless, the emphasis of the Constitution is lost due to the scant resources devoted to trying to compensate people who have no income or else try to achieve a balance between supply and demand in the labor market. Ramírez (2006) and Ramírez (2021) explain that an intervention through ALMP could improve stability in the labor market, in addition to establishing a floor for the minimum wage. Possibly the most relevant self-restriction is low revenue levels, but in

with the adjustment made in 2017 due to the increase in indebtedness, which framed the return to fiscal austerity, the budget allocation for LMP was less than 0.005%. Even in 2020 due to the pandemic crisis, spending on average increased by more than one percentage point relative to GDP in OECD countries, as seen in Figure 1. By way of comparison, Chile, since 2008, has recurrently increased the percentage of resources allocated to LMP: 0.26% in 2008, 0.5% in 2019, and 2020 1.24%.

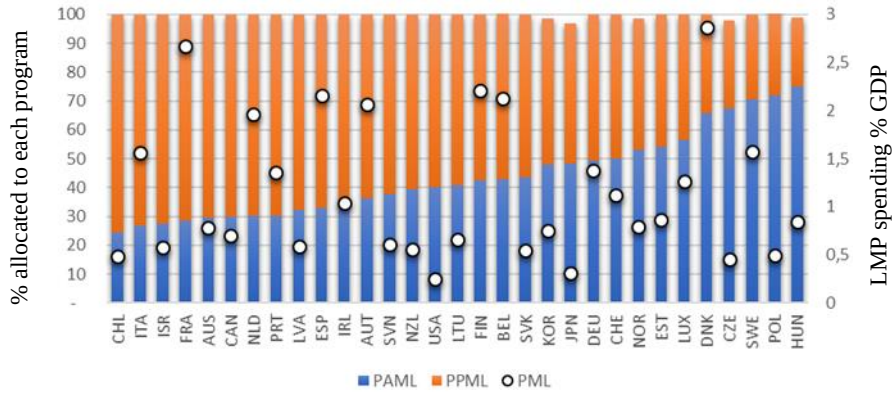

Figure 2. Total resources allocated to LMP (%GDP, 2018) and their composition
Source: created by the authors with OECD data

Finally, regarding Figure 2, in which of the categories mentioned in Table 1 is the spending concentrated in the countries that spend the most, namely France and Denmark: regarding ALMP, about a third is focused on training and supported employment and rehabilitation, respectively; in the case of PMLP, in Denmark 90% is allocated for maintenance and support of income without work, while in France it is 100%. In the countries at the extremes, Chile and Hungary, in terms of ALMP, both spend more on direct job creation with 33 and 63 %, respectively, while in PLMP, spending is similar to France.

Empirical evidence supports government participation in LMPs and especially in ALMPs; nevertheless, Bucheli (2005) states the need to pay attention to program design, considering the causes of unemployment, its duration, the profile of the unemployed, and their probability of finding employment. An appropriate design will lead to acceptable results. In evaluating ALMPs, the Public Employment Service and Management is considered one of the best performers (Bucheli, 2005). Regarding design, Calmfors (1995) mentions that a scheme should be sought that provides the unemployed with better

Mexico there is room to expand fiscal space through tax reform as mentioned in Ramírez (2020, 2022, and 2023). Similar conclusions are reached by Sovilla (2018). Bucheli (2005) argues that some countries participate in the generation of temporary employment to reduce poverty rather than for employment purposes, as was the case of Mexico and its temporary employment program. In Ramírez (2006) some details of this program are given.

opportunities for employment while avoiding the generation of perverse incentives that lead them not to do so, and the best way to achieve a good result is to have a portfolio of programs with all available policies since each of them offers different alternatives that can usefully complement each other.

Although there is some consensus on the benefits of ALMPs, there are also some questions related to the heterogeneity of the results according to the country in question, in addition to whether the programs that seek greater employability are also valid at times when labor demand is low or only for good times (Martín, 2014). According to Kluve (2010), a large part of the result that can be obtained will depend on the program chosen, where programs such as employment services and management can improve employability if they are accompanied by training and employment subsidies, while what should be avoided are direct employment policies in the public sector since they are not effective and do not offer greater employment opportunities for participants.

As Shanoun and Abdennadher (2018) and Vooren et al. (2019) also argue, ALMPs are a better option than PMLPs. Shanoun and Abdennadher (2018) performed an analysis of 18 OECD countries distributed in 4 groups with data corresponding to the period 2000-2014. The authors found an overall negative relation of ALMPs to the unemployment rate, with differentiated effects individually: training improves productivity and growth, generating more employment; the public employment service and management establishes a link between supply and demand, impacting unemployment downwards; employment policies and incentives are not effective, and if they are also very focused they generate inefficiency derived from the idea of dead weight and the increase in the cost of the subsidy; direct job creation policies, besides being irrelevant are also inefficient due to the creation of new supply with a low marginal product; incentives to start-up according to the authors is the best policy, besides being the one that entails the lowest costs.

Vooren et al. (2019), through the analysis of a sample of 57 experimental and quasi-experimental studies that offered 654 estimates published between 1990 and 2017, provide evidence of short- and long-run effects of ALMPs, although it is relatively inconclusive. Within their findings, services and public employment management stand out especially when there are sanction systems. Positive coefficients are found in training, but they are not significant. As for subsidized labor, direct job creation presents insignificant short-run results, and only subsidized labor is significantly positive in the long run.

Thus, different results should be considered to improve the dynamics of the labor market and, to this end, promote LMPs in those activities that have a high potential for generating employment, expanding the effect of the policy, as well as the growth and welfare of the population, thus satisfactorily complying with social policy.

Product input

In the economic literature, several studies with an input-output approach analyze multipliers and their impact on production, income, and employment. These analyses are carried out at the national and regional levels using different methodologies. Some of them are highlighted below.

Boundi (2016) identifies the key industries of the Mexican economy with the application of different methodologies based on input-output analysis, proposed by Chenery-Watanabe (1958), Rasmussen (1963), Leontief (1985) and Ghosh's (1958, 1968) supply approach. The results of these applications show that the key sectors in Mexico are the intermediate goods and capital goods industries. In calculating production linkages, the Rasmussen method is more robust for measuring backward linkages (BL) and forward linkages (FL) effects. These results show that the industrial sectors are the most important in the Mexican economy.

Walle et al. (2022) present the main linkages and clusters of the State of Tamaulipas based on the regionalized input-output matrix (IOM). They perform a principal component analysis with the methodology of Feser and Bergman (2000) and a study of the linkages with the Chenery and Watanabe indices and the Rasmussen indices of power and dispersion sensitivity. Using Feser and Bergman's methodology, 11 clusters were identified, indicating where public resources and efforts to promote the State's economic development should be directed. The classification obtained by Rasmussen's power and dispersion sensitivity indices allowed them to identify eight key sectors. With these results, the authors conclude that the government should prioritize the food, energy, electricity, electronics, and auto parts sectors in its public investment agenda.

Mattas and Shrestha (1991) use input-output, output, employment, and income elasticities to identify key sectors of the Greek economy. They estimate linkages to compare elasticities and better understand the structure and dynamics of the economy. Their results find that agriculture, food, construction, transportation, services, trade, banking, and textiles are the most important sectors for the Greek economy regarding potential output, employment, and income and recognize that sectoral classifications depend on the index used: elasticities or linkages. Elasticities reflect the relative capacities of sectors to generate impacts according to their sizes. They conclude that the elasticity approach produces more robust estimates of sectoral output, employment, and income potentials than the backward linkage approach.

Pérez-Santillán (2022) derives the key sectors from the linkage measures developed by Rasmussen (1963). The author uses IOMs published by the OECD in its 2018 edition, disaggregated into 36 sectors for the period 2005-2015. The key sectors for the Mexican economy are mining support services; wood and wood products and cork; paper and printing products; coke and refined petroleum

products; chemical and pharmaceutical products; rubber and plastic products; other non-metallic mineral products; basic metals; fabricated metal products; and electrical equipment.

Through a comparative analysis of the matrices of regional and national technological coefficients for Chile, Arriagada (2004) distinguishes in the production structure of the region those branches with the potential to become dynamic axes of growth. The results show great similarities, such as the linkages of the production sectors of the national and regional structure, so that the classification of key, driving, strategic, and independent activities is similar, except for commerce, hotels, and restaurants.

Mendoza (2020) presents the relations of economic interdependence in the production structure of Sonora using the 2013 input-output matrix. The author's analysis shows that primary and industrial activities are key to the development of the production structure. In the classic approach of key sectors, the author found that the activities that generate the most economic interdependencies are agriculture, stockbreeding, hunting, and fishing; non-oil mining, input manufacturing, textile finishing, wood industry, paper industries, printing, and related industries; manufacture of petroleum and coal products, manufacture of products based on non-metallic minerals, and basic metal industries. Finally, the author recommends that the promotion of state economic development has to consider the existing economic interdependencies in primary and industrial activities, as a way to increase the possibilities of growth and state sectorial development.

Alarcón (2018) performs an analysis for Mexico, using graph theory to hierarchize the technology-based sectors (TBS) and their production linkages based on the 2012 national Input-Output matrix. The analysis describes the hierarchies through their sales and purchases and the sectoral interrelationships generated by their relative position with the rest of the industrial sectors, showing that the chemical and pharmaceutical subsector is key in the production linkages. In contrast, the other technology-based subsectors are positioned mostly as drivers or independent.

Fuentes and García-Andrés (2009) emphasize that the search for key sectors of the economy based on production linkages does not consider that key sectors are not defined exclusively in terms of economic weight or the intensity of direct economic relations but rather in terms of the role played by productive interrelationships. The strength and stability of a structure depend not only on the weight of the relations between sectors but also on their relative position. This method allows them to carry out a sectoral hierarchization considering the dependency relations.

These studies focus mainly on the input-output analysis of intersectoral linkages, highlighting the importance of this methodology for identifying the activities that generate the most employment. Others include the approach of elasticities and intersectoral linkages to perceive key, driving, and strategic sectors. Therefore, this research is consistent with the methodology that seeks to discover the main economic activities that are generating employment for the Mexican economy, which is very useful for

the design of active policies in the labor market focused on education and training with programs that improve employability in the most dynamic and interconnected activities.

Methodological approach to the productive interrelation of employment

In economic analysis, some methodologies make it possible to understand the interrelation of economic activities and estimate their effects on employment to guide government spending policies. Input-output matrices represent the economic structure of a country and show the interchange of production sectors at a given moment in time. They also express the relation between final demand and the primary inputs used in the production process. This structural analysis of the economy and the production system as a whole, developed by Leontief (1936), represents all the production and distribution operations in an economy at a given time. It provides information on both intersectoral flows and the disaggregation between final demand and primary inputs to build the matrix of technical coefficients and the Leontief inverse to obtain multipliers used for the interpretation of the production structure (Cardenete and López, 2012; 40-41).

The input-output matrix (IOM) shows the intersectoral economic relations, the cost structure by economic activity, and the composition of the final spending of the various economic agents.

The open Leontief model[3] expresses the system of equations in matrix form as follows:

$$x = Ax + y \tag{1}$$

Where:

x: gross value of production

A: technical coefficient matrix, $A = (aij)$

Ax: intermediate demand

y: final demand, which includes Consumption (C), Investment (I), Government spending (G), and Net exports (X-M).

The direct requirements matrix is called A since the elements of this matrix indicate the ratio in which an input is demanded to generate one unit of output. The open Leontief model can be expressed as:

$$x = Ax + y \tag{2}$$

[3] For further disaggregation of the model, see Arriaga and Gonzalez (2019).

$$x = (I - A)^{-1}.y \; = \; B.y \tag{3}$$

where the matrix $B = (bij) = (I - A)^{-1}$ is the inverse Leontief or total requirements matrix (direct and indirect) and relates the production of each sector Xi with the final net demand of imports, a variable considered exogenous.

The bij elements of the inverse Leontief matrix quantify the impact on the i-th industry of a change in the net final demand for imports of the j-th sector. These coefficients capture direct and indirect multiplier effects since the product of each affected sector should impact not only on itself but also on the other sectors that use it as an input (Schuschny, 2005: 14). The geometric series for any matrix A is:

$$(I - A)^{-1} = \; I + A + A^2 + A^3 + \cdots + A^n + \ldots = \sum_{k=0}^{\infty} A^k \tag{4}$$

This identity presents the direct and indirect effects of final demand on the production process. The first term refers to the production necessary to meet such final demand directly; the second to the additional production to meet the input needs for the production required to meet that final demand (first round); the third round is the additional production to meet the incremental production of the second round, and so on (Schuschny, 2005; 15).

The application of the model shows an image of the productive relations corresponding to the year of analysis; therefore, the extrapolation of its results would have to consider that the coefficients are constant and do not change. Although this is a restriction of the model, it does not invalidate the results since in some sectors the changes affecting the technical composition of the coefficients, such as technological changes, are not immediate.

Performance analysis with a structural approach to employment

This section addresses the study of employment through the input-output matrix at the subsector level of the Mexican economy for the year 2013.[4] The analysis presents the relations between the different subsectors and the volume of jobs generated by the economy; it estimates the coefficients of direct, indirect, and total employment and the employment multiplier to identify which subsectors have the potential capacity to generate more jobs directly and indirectly and the employment multiplier; in addition, it identifies the response of the subsectors to an increase in final demand and their contribution to total

[4] It should be noted that INEGI's (Spanish: Instituto Nacional de Estadística, Geografía, e Informática) latest publication of the input-output matrices is from the year 2018 and the economic information therein is from the year 2013.

employment. This last indicator corresponds to the employment-product elasticity, which combines the employment coefficients and the economic weight of the subsector in final demand spending as a ratio of total employment. Thus, it is possible to orient public policy toward those subsectors that have a greater impact on employment at the national level based on the structural interrelation.

Estimated direct and indirect employment generated by the Mexican economy

The importance of economic activity in the generation of employment can be identified by its volume, establishing:

1. Share of total employment (direct and indirect) in volume.
2. Share of indirect jobs relative to total employment in the subsector. This refers to the industry's level of linkage with the rest of the economy.

This differentiation is relevant because there are subsectors, on the one hand, with a high level of direct employment generation and that therefore stand out in job creation; nevertheless, they may have low inter-industrial linkages, which will be reflected in a lower ratio of indirect employment. On the other hand, others register greater inter-industrial linkages, which will present higher levels of indirect employment in relation to the direct employment generated by the activity but which, in terms of the number of jobs, is not as significant (Sánchez, 2015; 11).

Estimates of total direct and indirect employment indicate that the largest share is in the Retail Trade (17%), Agriculture (10%), Business Support Services (8%), Building (6%), Legislative and Government Activities (4%), Educational Services (4%), Households with Domestic Employees (4%), and Food and Beverage Preparation Services (4%) subsectors. (Table 2).

Table 2
Direct and indirect employment for the mexican economy

Economic Subsectors	Direct Employment	Share %	Indirect Employment	Share %	Direct and Indirect Employment	Share %
461 - Retail trade in groceries, food, beverages, ice, and tobacco	8532007	21.18%	1162100	6.76%	9694107	16.87%
111 - Agriculture	2863884	7.11%	3085981	17.96%	5949865	10.35%
561 - Business support services	277800	0.69%	4377827	25.47%	4655627	8.10%
236 - Building	3573033	8.87%	61111	0.36%	3634144	6.32%
931 - Legislative, governmental, and law enforcement activities	2576092	6.40%	4075	0.02%	2580167	4.49%

611 - Educational services	2527442	6.27%	19803	0.12%	2547245	4.43%
814 - Households with domestic employees	2332443	5.79%	0	0.00%	2332443	4.06%
722 - Food and beverage preparation services	1906387	4.73%	328850	1.91%	2235237	3.89%
811 - Repair and maintenance services	618194	1.53%	1174369	6.83%	1792563	3.12%
311 - Food Industry	1373613	3.41%	289683	1.69%	1663296	2.89%
812 - Personal services	1251992	3.11%	73675	0.43%	1325667	2.31%
431 - Wholesale trade of groceries, food, beverages, ice, and tobacco	531360	1.32%	791628	4.61%	1322988	2.30%
112 - Animal husbandry and farming	321100	0.80%	780282	4.54%	1101382	1.92%
237 - Construction of civil engineering works	1014396	2.52%	45708	0.27%	1060104	1.84%
485 - Passenger land transportation, except by railroad	999869	2.48%	51431	0.30%	1051300	1.83%
484 - Freight transportation	729431	1.81%	273014	1.59%	1002445	1.74%
336 - Manufacture of transportation equipment	791052	1.96%	100469	0.58%	891521	1.55%
541 - Professional, scientific, and technical services	143949	0.36%	734610	4.27%	878559	1.53%
238 - Specialized construction work	121433	0.30%	742417	4.32%	863850	1.50%
315 - Garment manufacturing	635757	1.58%	80858	0.47%	716615	1.25%
334 - Manufacturing of computer, communication, measuring, and other electronic equipment, components, and accessories	643338	1.60%	12341	0.07%	655679	1.14%
621 - Outpatient medical and related services	641589	1.59%	7785	0.05%	649374	1.13%
622 - Hospitals	603108	1.50%	1519	0.01%	604627	1.05%
332 - Metal products manufacturing	322820	0.80%	269196	1.57%	592016	1.03%
531 - Real estate services	465222	1.15%	63338	0.37%	528560	0.92%
Total employment and share 79 subsectors	40279018	70.09%	17186972	29.91%	57465990	100.0%

Source: created by the authors based on information from the input-output matrix 2013

Direct employment represents 70% of total employment, with the following major economic subsectors: Retail Trade (21%), Building (9%), Agriculture (7%), Legislative and Government Activities (6%), Educational Services (6%), Households with Domestic Employees (6%), and Food and Beverage Preparation Services (5%), which together account for 61% of total direct employment (Table 2, Figure 3).

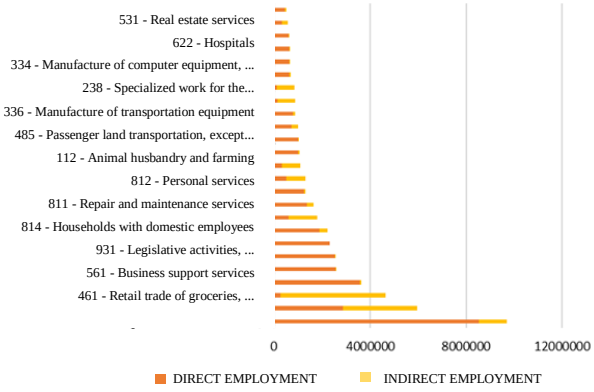

Figure 3. Direct and Indirect Employment
Source: created by the authors based on information from the input-output matrix 2013

Indirect jobs represent 30% of total jobs generated by the productive interrelation of intermediate demand. The subsectors that in volume generate the most indirect jobs are: Business Support Services (25%), Agriculture (18%), Repair and Maintenance Services (7%), Retail Trade (7%), Wholesale Trade (5%), Animal Husbandry and Farming (5%), Specialized Works for Construction (4%), Professional Services (4%), Food and Beverage Preparation Services (2%), and Food Industry (2%), which together account for 73% of the total indirect jobs in the economy. (Table 2)

The subsectors that stand out most in indirect employment as a ratio of total employment in their economic activity are Business support services (94%), Specialized work for construction (86%), Professional, scientific, and technical services (84%), Manufacture of products based on non-metallic minerals (77%), Animal husbandry and farming (71%), Repair and maintenance services (66%), Wholesale trade of groceries, food, beverages and tobacco (60%), and Agriculture (62%), while in the manufacturing sector, with approximately 50% of indirect linkage in the generation of jobs, the subsectors of the plastics and rubber industry, the chemical industry, and the manufacture of metal products are the most prominent (Figure 4).

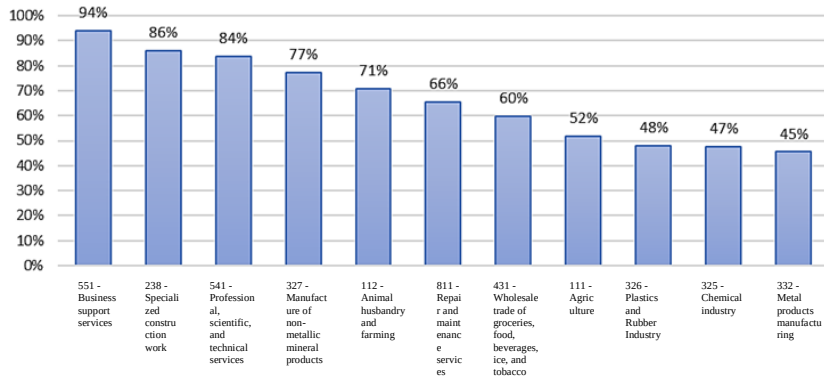

Figure 4. Share of indirect jobs in relation to total jobs in the subsector
Source: created by the authors based on information from the input-output matrix 2013

Estimation of employment coefficients, multipliers, and employment-product elasticities

There is a set of employment indicators for economic activities that can contribute to the construction of a public employment policy. The appropriate estimators for this purpose are the coefficients of direct and indirect employment, which are obtained from the matrix of direct and indirect employment requirements and the employment multipliers; additionally, the calculation of employment-product elasticities enables the identification of the economic activities with the greatest impact on total employment in the face of changes in the sector's demand. This is very important because it indicates the potential employment in the event of increases in the final demand of the subsector.

These indicators are presented below, following the methodological approaches of Arriaga et al. (2021).

Employment coefficients

Direct employment coefficients measure the employment requirement of each sector, i.e., employment per monetary unit of output.

$$CL_j^d = \frac{L_j}{VBP_j} \tag{5}$$

L_j: Employed personnel of sector j

VBP_j: Gross Value of Production (GVP) of sector j

CL_j^d: Measures how many direct jobs are generated in sector j, given an increase in the final demand of sector j.

The matrix product of direct employment coefficients and the Leontief inverse obtains the total employment matrix. The direct and indirect employment coefficients (CL) of each sector of economic activity are obtained from the column sum of the CL^T matrix of total employment. For each sector j, the corresponding column of the total employment matrix indicates the employment requirement toward sector j and the indirect requirements toward the other sectors per unit of j's GVP. The indirect coefficients are calculated as the difference between the total and direct coefficients.

$$CL^T = CL^d \tag{6}$$

This results in

$$CL_j^T = \sum_i CL_i^d \ bij \tag{7}$$

Where CL_j^T is the total employment of each j-th economic subsector (sums per column of the matrix resulting from the above multiplication). Thus, for each j-th subsector, the column of the CL_j^T matrix shows the total (direct and indirect) employment requirements toward the industry itself and the indirect requirements toward the other industries per unit of j's GVP.

The indirect employment requirements (indirect coefficients) of employment toward the same sector (CL_j^i) are calculated as the difference between the total requirements toward that industry (CL_j^T) and the direct requirements (CL_j^d):

$$CL_j^i = CL_j^T - CL_j^d \tag{8}$$

With this indirect coefficient, it is possible to estimate how many jobs are generated in the rest of the sectors of the economy in the face of increases in the final demand of sub-sector j. The process shows that an increase in the final demand of subsector j generates an increase in the gross production of the subsector itself, which in turn leads to an increase in the demand for inputs necessary for the production of j. Thus, an increase in the demand for inputs leads to an increase in the gross production of the

subsectors supplying those inputs chained to subsector j, which leads to an increase in employment and value added (remunerations) in those subsectors. (Durán and Castresana, 2016: 12)

The employment coefficient represents the number of jobs per million pesos of spending associated with final demand in the economic subsector. The following subsectors register the highest coefficients of total employment (direct and indirect). On the one hand, it is observed that the highest total employment generation is attributed to a group of subsectors where the source of job creation is the sector itself, such as Households with domestic employees (29.94), Agriculture (14.26), Repair and maintenance services (12.37), Services related to agricultural activities (11.60), Manufacture of textile products, except clothing (8.37), and Food and beverage preparation services (7.60). On the other hand, there are subsectors with outstanding total employment coefficients, where the generation of jobs is explained to a greater extent by the indirect coefficients due to their greater linkages in the subsectors. Such is the case of the Food industry (3.17), Animal husbandry and farming (3.28), Social welfare services (2.37), Manufacture of textile inputs and textile finishing (1.94), Wood industry (2.05), Electronic information processing, hosting (1.94). (Table 3).

Table 3
Direct and indirect employment coefficients and employment multipliers

Economic Subsectors	Direct Employment Coefficients	Indirect Employment Coefficients	Direct and Indirect Employment Coefficients	Employment multiplier
814 - Households with domestic employees	29.94	0.00	29.94	1.00
111 - Agriculture	14.26	0.55	14.82	1.04
115 - Services related to agriculture, husbandry, and forestry	12.37	1.48	13.85	1.12
811 - Repair and maintenance services	11.60	0.82	12.42	1.07
624 - Other social welfare services	7.37	2.37	9.73	1.32
314 - Manufacture of textile products, except garments	8.37	1.35	9.71	1.16
114 - Fishing, hunting, and trapping	8.54	0.77	9.31	1.09
722 - Food and beverage preparation services	7.60	1.40	9.00	1.18
623 - Social welfare and healthcare residences	7.90	0.89	8.79	1.11
812 - Personal services	7.35	0.43	7.77	1.06
561 - Business support services	6.98	0.38	7.36	1.05
112 - Animal husbandry and farming	3.16	3.28	6.44	2.04
315 - Garment manufacturing	4.82	1.38	6.21	1.29
461 - Retail trade in groceries, food, beverages, ice and tobacco	5.42	0.53	5.95	1.10
493 - Storage services	3.95	1.42	5.37	1.36

337 - Manufacture of furniture, mattresses, and blinds	3.87	1.44	5.31	1.37
238 - Specialized construction work	4.69	0.61	5.30	1.13
113 - Forest harvesting	4.15	0.95	5.10	1.23
321 - Wood industry	2.92	2.05	4.97	1.70
487 - Tourist transportation	3.88	0.99	4.88	1.25
813 - Associations and organizations	3.79	0.73	4.52	1.19
316 - Tanning and dressing of hides and leather, and manufacture of leather, hides, and imitation leather products	2.91	1.56	4.47	1.53
562 - Waste and debris management and remediation services	3.45	1.01	4.46	1.29
491 - Postal Services	3.94	0.51	4.45	1.13
713 - Entertainment services in recreational facilities and other recreational services	3.06	1.37	4.43	1.45
711 - Artistic, cultural, sporting, and other related services	3.60	0.65	4.25	1.18
311 - Food industry	1.02	3.17	4.19	4.10
519 - Other information services	2.28	1.86	4.14	1.82
518 - Electronic information processing, hosting, and other related services	2.17	1.94	4.11	1.89
313 - Manufacture of textile supplies and textile finishing	2.02	1.94	3.96	1.96
323 - Printing and related industries	2.34	1.37	3.71	1.58
236 - Building	2.72	0.99	3.71	1.36
611 - Educational services	3.40	0.28	3.69	1.08
931 - Legislative, governmental, and law enforcement activities	2.71	0.74	3.45	1.27

Source: created by the authors based on information from the input-output matrix 2013

Employment multiplier

The analysis of multipliers contributes to the study of economic impact. It shows how an increase in final demand generates an increase in production greater than the initial growth for each increase in production. This is associated with an increase in employment, which will depend on the direct employment coefficients.

Multipliers indicate how many jobs are generated in the rest of the sectors of the economy (indirect employment) when the demand for inputs of sector j increases. As the final demand of sector j increases, an increase in the sector's gross production is generated, which leads to an expansion of the demand for inputs necessary for the production of economic activity j. The increase in the demand for inputs produces an increase in the gross production of the activities supplying those inputs, chained to sector j, which leads to an increase in employment.

Employment multipliers are obtained by dividing the total employment coefficients (direct and indirect) by the direct employment coefficients for each economic subsector:

$$mL = \frac{CL_j^T}{CL_j^d} \tag{9}$$

The most prominent subsectors for their employment multipliers are Food Industry (4.10), Animal husbandry and farming (2.04), Electronic information processing, hosting (1.89), Other information services (1.82), and Textile input manufacturing and textile finishing (1.96). This means that the food industry subsector generates 1.02 direct jobs for each million pesos of investment, its employment multiplier is 4.1, and the total jobs are 4.19. It should be noted that there are economic subsectors with high indirect coefficients and employment multipliers; nonetheless, as their direct employment base is too small, they are not identified in the economic activities that generate the most jobs per million pesos of final demand spending.

It should be noted that the multipliers estimate short-run economic changes, leaving out long-run adjustments; therefore, the impacts identified are transitory. Their construction is based on input-output matrices based on inter-industry transactions occurring in five or more previous years. The above implies that if the structural relations indicated by the matrix are modified due to technological changes or the appearance of new products, the reliability of the impact analysis using the initial multipliers is diminished. (Ramos et al. 2017)

Employment-product elasticity

A relevant indicator for studying the economic impact on employment is the employment-product elasticity, estimated by considering the economic weight and the direct and indirect employment coefficients. This reveals the effect on total employment in the economy in the face of exogenous increases in the final demand of a particular economic activity (Sánchez, 2015:17).

Elasticity of sector j

$$E_j^e = \left[\sum_{i=1}^{n} \left(\frac{L_i}{x_i}\right) b_{ij}\right] \frac{y_j}{L} \tag{10}$$

Where L_i and x_i is the employment and output of product i consumed by sector j, bij is the ij-th coefficient of the direct and indirect employment requirements matrix, and y_j is the final demand of sector j. (Sanchez, 2015:17)

Thus, a 1% increase in the subsector means it can meet sustainable final demand increases due to its economic weight. The subsectors that contribute the most to employment in the economy, in the face of 1% increases in their final demand, are Retail grocery, food, and beverage trade (93 750), Food industry (56 404), Building (48 762), Legislative and governmental activities (32 770), Agriculture (29 767), Educational services (27 404), Households with domestic employees (23 337), Food and beverage preparation services (22 593), and Transportation equipment manufacturing (21 623) (Appendix 1).

Direct and indirect linkages: key, strategic, driving, and independent subsectors

In order to detail the structural approach to input-output analysis, multiple studies analyze economic activities and their relation to the production cluster. On the one hand, there is the work of Rasmussen (1956) to classify economic activities according to their power and dispersion sensitivity, as well as the study of Chenery and Watanabe (1958) establishing classifications for economic activities according to the value of the technical coefficients and their forward or backward linkages and the contribution of Hirschman (1958) that establishes methodological and empirical criteria to identify the key sectors of an economy through forward linkages (FL) as activities that generate inputs for other activities and backward linkages (BL), or as those that induce the development of other economic activities that provide inputs. (Cardenete and López, 2012:41)

The inter-industrial relations of the economic activities are located with the so-called linkages. This section shows the linkages of the economic structure, which will enable a differentiated classification into key, driving, strategic, and independent (Table 4). Applying the methodology of Rasmussen (1963), it is possible to capture both direct and indirect effects from the Leontief matrix, which is not possible in the model proposed by Chenery and Watanabe (1958) because it only captures direct effects.

The key subsectors have high FL and BL linkages, as they are strong demanders and suppliers of inputs. Strategic subsectors are characterized by having a lower demand for inputs; nevertheless, they supply inputs to other subsectors. They are subsectors that can generate production blockages in the event of demand shocks. The driving or strong drag subsectors have low FL linkages and very high BL, as they are drivers of the economy; they have high intermediate consumption and a supply of products that mostly supply the final demand. The independent subsectors consume a small number of intermediate inputs and dedicate their production to the final demand. These subsectors do not cause significant drag effects in the

economic system, nor do they react significantly to the drag effect caused by variations in the intermediate demand of other sectors (Arriaga and González, 2019:51-52).

Table 4
Subsector identification, Rassmusen methodology

	$\pi_j < 1$	$\pi_j \geq 1$
$\tau_i \geq 1$	Strategic Sectors	Key Sectors
$\tau_i < 1$	Independent Sectors	Driving sectors

Source: Schuschny (2005: 41)

With the application of the methodology, the estimates indicate that the key subsectors are the food industry, basic metal industry, manufacture of petroleum products, generation and transmission of electric power and gas, paper industry, and repair and maintenance services with high backward and forward linkages, i.e., they are strong demanders and suppliers of inputs and a pillar of the inter-sectoral flows. Although there are few key sectors, which may be a sign of structural weakness, it should be noted that the greatest weight of the economic structure is found in the driving and strategic sectors, which increases the possibility of the emergence of new sectors that allow for greater productive diversification in the future (Table 5).

Table 5
Share of subsectors in the Economic Structure

Type of subsector	No. of subsectors	Share	Share of Final Demand
Key	7	9%	14%
Strategic	13	16%	31%
Driver	37	47%	33%
Independent	22	28%	22%
Total	79	100%	100%

Source: created by the authors based on information from the input-output matrix 2013

The subsectors show differentiated results when the employment estimates are combined with the above classification. In other words, the key subsectors of the economy are not the largest generators of employment since their economic weight does not give this characteristic, which is due to intersectoral flows and their high connectivity with the rest of the economic activities. An interesting result will be identifying subsectors with high intersectoral flows and a high economic weight that generate direct and indirect employment (Table 6).

Table 6
Subsectors Potential indicators to generate employment

No.	Economic Subsectors	Direct Employment Coefficients	Indirect Employment Coefficients	Direct and Indirect Employment Coefficient TYPE 1	Employment multiplier	Employment-product elasticity %	Classification
36	461 - Retail trade in groceries, food, beverages, ice, and tobacco	5.42	0.53	5.95	1.10	0.1630552	Strategic
14	311 - Food Industry	1.02	3.17	4.19	4.10	0.0981011	Key
11	236 - Building	2.72	0.99	3.71	1.36	0.0848090	Driver
79	931 - Legislative, governmental, and law enforcement activities	2.71	0.74	3.45	1.27	0.0569960	Independent
1	111 - Agriculture	14.26	0.55	14.82	1.04	0.0517731	Strategic
65	611 - Educational services	3.40	0.28	3.69	1.08	0.0476629	Independent
78	814 - Households with domestic employees	29.94	0.00	29.94	1.00	0.0405882	Independent
74	722 - Food and beverage preparation services	7.60	1.40	9.00	1.18	0.0392943	Driver
32	336 - Manufacture of transportation equipment	0.46	0.79	1.25	2.73	0.0376074	Driver
12	237 - Construction of civil engineering works	1.84	1.25	3.09	1.68	0.0295968	Driver
41	485 - Passenger land transportation, except by railroad	1.80	0.71	2.51	1.39	0.0242614	Driver
76	812 - Personal services	7.35	0.43	7.77	1.06	0.0230526	Independent
40	484 - Freight transportation	1.34	0.53	1.87	1.39	0.0176773	Strategic
30	334 - Manufacturing of computer, communication, measuring, and other electronic equipment, components, and accessories	0.68	0.31	0.99	1.45	0.0162803	Independent
67	622 - Hospitals	1.89	0.80	2.69	1.42	0.0149496	Independent
35	431 - Wholesale trade of groceries,	0.83	0.49	1.32	1.59	0.0147015	Strategic

	food, beverages, ice, and tobacco						
18	315 - Garment manufacturing	4.82	1.38	6.21	1.29	0.01422333	Driver
66	621 - Outpatient medical and related services	2.74	0.57	3.32	1.21	0.0134977	Independent
55	522 - Non-stock market credit and financial intermediation institutions	0.56	0.97	1.53	2.73	0.0127241	Strategic
58	531 - Real estate services	0.28	0.15	0.43	1.56	0.0126492	Strategic
15	312 - Beverage and tobacco industry	0.63	1.66	2.28	3.63	0.0116796	Driver
75	811 - Repair and maintenance services	11.60	0.82	12.42	1.07	0.0115170	Key
2	112 - Animal husbandry and farming	3.16	3.28	6.44	2.04	0.0113814	Driver
24	325 - Chemical industry	0.36	0.85	1.21	3.34	0.0095800	Key
31	335 - Manufacture of electrical accessories, apparatus, and power-generating equipment	0.85	0.78	1.63	1.92	0.0087359	Driver
28	332 - Metal products manufacturing	1.88	1.02	2.90	1.54	0.0086604	Driver
34	339 - Other manufacturing industries	2.01	0.56	2.57	1.28	0.0080524	Independent
33	337 - Manufacture of furniture, mattresses, and blinds	3.87	1.44	5.31	1.37	0.0075679	Driver
73	721 - Temporary lodging services	1.51	0.78	2.29	1.51	0.0075428	Independent
29	333 - Machinery and equipment manufacturing	0.91	0.65	1.56	1.72	0.0071406	Independent
57	524 - Bonding, insurance, and pension companies	0.47	1.69	2.16	4.59	0.0064356	Driver
25	326 - Plastics and rubber industry	1.26	1.02	2.27	1.81	0.0055802	Driver
27	331 - Basic metal industries	0.20	0.97	1.17	5.83	0.0052768	Key
63	561 - Business support services	6.98	0.38	7.36	1.05	0.0050956	Strategic

72	713 - Entertainment services in recreational facilities and other recreational services	3.06	1.37	4.43	1.45	0.0050033	Driver

Source: created by the authors based on information from the input-output matrix 2013

According to the presentation, a complete indicator for identifying employment-generating subsectors is the employment-income elasticity, which, added to the potential identified as strategic, key, driving, and independent subsectors, provides the appropriate elements for public policy design. The generation of indirect jobs and the multipliers show the capacity of the subsectors to have a greater interrelation with the rest of the economic activities, which is reinforced in the study with the classification proposed by Rasmussen. Finally, the employment-product elasticity incorporates the economic weight of the subsector and the generation of direct and indirect employment as the most complete indicator of employment response.

For this study's purposes, it is worth highlighting the subsectors whose classification presents a greater productive connection in the economic structure and, therefore, register high levels of employment coefficients that respond to a greater extent to the indirect coefficients and economic weight. In this regard, the food industry, building, agriculture, food and beverage preparation, transportation equipment, construction of civil engineering works, clothing manufacture, and animal husbandry and farming are the most important subsectors to encourage through a public employment policy.

Conclusions

The input-output analysis at a more detailed level of disaggregation of economic activities made it possible to estimate indicators to derive a proposal for the design of public employment policies in Mexico. The estimates of direct and indirect employment coefficients, the calculation of employment-product elasticities, and the classification of the subsectors into key, strategic, driving, and independent, as a characteristic of the level of connectivity of the economy and its capacity to generate employment, indicate that the subsectors of the food industry, building, agriculture, food and beverage preparation, transportation equipment, civil engineering construction, garment manufacturing, and animal husbandry are the most relevant for proposing a public employment policy that considers the economic structure and its level of interrelation.

Based on the discussion and estimates presented in this research, public policy must be established in at least four directions derived from the LMP review. On the one hand, the creation of a bridge between supply and demand, through a policy of services and public management of jobs, in the

subsectors mentioned above to facilitate hiring; implementing a training policy that, together with the employment incentive policy, would give rise to a program of on-the-job training, linking concretely the needs of labor demand with the generation of skills in the labor supply. To the extent of the requirements of both the subsectors and the additional employment demands, it is possible to generate supply and linkage networks that balance the factor and product markets through the start-up incentive policy.

The design of policies must respond to the needs of the identified subsectors and have the necessary public resources to operate. It is important that the dynamics of the labor market be reactivated and that public policies in Mexico related to employment be developed under this prerogative and not as a relief to poverty, as Bucheli (2005) pointed out.

Given the fiscal austerity maintained in the country for at least the last seven years, the allocation or reallocation of spending involves moving resources from one portfolio to another, with LMP being relatively neglected given the reduced budget allocation, as stated in section II of this paper. Young and Young (2019) document how the increase in pension spending has harmed LMPs. In Mexico in 2019, a program called "Jóvenes construyendo el futuro" (JCF) was launched, which was extremely promising and went in the direction of the ALMPs; however, the haste with which it was implemented generated a series of criticisms and observations regarding its operation, in addition to the fact that two years after it began, the budget allocation was reduced by almost half (Ramírez & Martínez, 2022).[5] It is possible to think that programs such as JCF can be designed considering the estimates derived from the study, with which the link between young people and labor activities would give a better result regarding inclusion, employment generation, and welfare.

Within the work agenda, determining intersectoral linkages at the local level is still pending to have information that will contribute to the design of policies at the regional level or by the Federal State, improving the results in terms of employment, economic growth, and well-being throughout the Mexican territory.

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[5]While resources for senior citizens' pensions increased by 35%.

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Annex

Table A1
Employment-product elasticity and total employment effect

No.	Economic Sectors	Final Demand 2013 (Millions of Mexican pesos)	1% increase in Final Demand	Total Employment Increase	Employment-product elasticity %
36	461 - Retail trade in groceries, food, beverages, ice, and tobacco	1575215	15752	93750	0.16305523
14	311 - Food industry	1345052	13451	56404	0.098101095
11	236 - Building	1312862	13129	48762	0.084808954
79	931 - Legislative, governmental, and law enforcement activities	950501	9505	32770	0.056996036
1	111 - Agriculture	200802	2008	29767	0.051773056
65	611 - Educational services	743098	7431	27404	0.047662942
78	814 - Households with domestic employees	77908	779	23337	0.040588233
74	722 - Food and beverage preparation services	250955	2510	22593	0.039294272
32	336 - Manufacture of transportation equipment	1731319	17313	21623	0.037607369
12	237 - Construction of civil engineering works	550774	5508	17017	0.029596812
41	485 - Passenger land transportation, except by railroad	554445	5544	13949	0.024261366
76	812 - Personal services	170431	1704	13254	0.0230526
40	484 - Freight transportation	542674	5427	10164	0.017677307
30	334 - Manufacturing of computer, communication, measuring, and	946827	9468	9361	0.01628034

	other electronic equipment, components, and accessories				
67	622 - Hospitals	319177	3192	8595	0.014949606
35	431 - Wholesale trade of groceries, food, beverages, ice, and tobacco	640890	6409	8453	0.014701546
18	315 - Garment manufacturing	131808	1318	8184	0.014233286
66	621 - Outpatient medical and related services	233838	2338	7761	0.013497692
55	522 - Non-stock market credit and financial intermediation institutions	478772	4788	7316	0.012724054
58	531 - Real estate services	1689979	16900	7273	0.012649228
15	312 - Beverage and tobacco industry	293791	2938	6715	0.011679574
75	811 - Repair and maintenance services	53303	533	6622	0.011516959
2	112 - Animal husbandry and farming	101633	1016	6544	0.011381365
24	325 - Chemical industry	455822	4558	5508	0.009579985
31	335 - Manufacture of electrical accessories, apparatus, and power-generating equipment	307432	3074	5023	0.008735916

Source: created by the authors based on information from the input-output matrix 2013

Table A2
Classification of production linkages

No.	Economic Subsectors	Backward linkage indices	Forward linkage indices	Classification
75	811 - Repair and maintenance services	1.02	1.02	Key
14	311 - Food Industry	1.21	1.19	Key
9	221 - Generation, transmission, and distribution of electricity	1.13	1.74	Key
21	322 - Paper industry	1.15	1.19	Key
23	324 - Manufacture of petroleum and coal products	1.15	3.12	Key
24	325 - Chemical industry	1.10	2.27	Key
27	331 - Basic metal industries	1.21	1.34	Key
1	111 - Agriculture	0.85	1.07	Strategic
6	211 - Oil and gas extraction	0.77	2.21	Strategic
7	212 - Mining of metallic and non-metallic ores, except oil and gas	0.97	1.22	Strategic
13	238 - Specialized construction work	0.91	1.08	Strategic
35	431 - Wholesale trade of groceries, food, beverages, ice, and tobacco	0.83	3.30	Strategic
36	461 - Retail trade in groceries, food, beverages, ice and tobacco	0.83	1.26	Strategic
40	484 - Freight transportation	0.88	1.17	Strategic
51	517 - Telecommunications	0.87	1.21	Strategic
55	522 - Non-stock market credit and financial intermediation institutions	0.89	1.01	Strategic
58	531 - Real estate services	0.73	1.67	Strategic
61	541 - Professional, scientific, and technical services	0.89	2.02	Strategic

62	551 - Corporate	0.97	1.12	Strategic
63	561 - Business support services	0.79	3.33	Strategic
2	112 - Animal husbandry and farming	1.14	0.86	Driver
4	114 - Fishing, hunting and trapping	1.10	0.68	Driver
5	115 - Services related to agriculture, husbandry, and forestry	1.01	0.72	Driver
8	213 - Mining-related services	1.07	0.70	Driver
10	222 - Water supply and piped gas supply to the final consumer	1.07	0.88	Driver
11	236 - Building	1.00	0.71	Driver
12	237 - Construction of civil engineering works	1.06	0.72	Driver
15	312 - Beverage and tobacco industry	1.12	0.75	Driver
16	313 - Manufacture of textile supplies and textile finishing	1.14	1.00	Driver
17	314 - Manufacture of textile products, except garments	1.07	0.70	Driver
18	315 - Garment manufacturing	1.07	0.74	Driver
19	316 - Tanning and dressing of hides and leather and product manufacturing	1.17	0.76	Driver
20	321 - Wood industry	1.17	0.90	Driver
22	323 - Printing and related industries	1.22	0.81	Driver
25	326 - Plastics and rubber industry	1.05	0.98	Driver
26	327 - Manufacture of non-metallic mineral products	1.29	0.96	Driver
28	332 - Metal products manufacturing	1.18	0.98	Driver
31	335 - Manufacture of electrical accessories, apparatus, and power-generating equipment	1.01	0.75	Driver
32	336 - Manufacture of transportation equipment	1.03	0.96	Driver
33	337 - Manufacture of furniture, mattresses, and blinds	1.19	0.69	Driver
37	481 - Air transportation	1.39	0.75	Driver
38	482 - Rail transportation	1.13	0.70	Driver
41	485 - Passenger land transportation, except by railroad	1.05	0.81	Driver
42	486 - Pipeline transportation	1.02	0.71	Driver
43	487 - Tourist transportation	1.19	0.67	Driver
46	492 - Courier and parcel delivery services	1.12	0.77	Driver
47	493 - Storage services	1.05	0.78	Driver
48	511 - Publishing of newspapers, magazines, books, software, and other materials	1.04	0.73	Driver
49	512 - Film and video industry and sound industry	1.04	0.80	Driver
50	515 - Radio and television	1.13	0.74	Driver
52	518 - Electronic information processing, hosting, and others	1.10	0.69	Driver
53	519 - Other information services	1.04	0.68	Driver
57	524 - Bonding, insurance, and pension companies	1.14	0.80	Driver
64	562 - Waste and debris management and remediation services	1.00	0.69	Driver
69	624 - Other social welfare services	1.18	0.75	Driver
72	713 - Entertainment services in recreational facilities and other recreational services	1.01	0.67	Driver

74	722 - Food and beverage preparation services	1.01	0.99	Driver
3	113 - Forest harvesting	0.83	0.90	Independent
29	333 - Machinery and equipment manufacturing	0.97	0.73	Independent
30	334 - Manufacture of computer, communication, measuring, and other electronic equipment, components, and accessories	0.77	0.74	Independent
34	339 - Other manufacturing industries	0.88	0.83	Independent
39	483 - Transportation by water	0.95	0.68	Independent
44	488 - Transportation-related services	0.92	0.96	Independent
45	491 - Postal services	0.82	0.68	Independent
54	521 - Central banking	0.79	0.69	Independent
56	523 - Stock exchange, foreign exchange, and financial investment activities	0.99	0.89	Independent
59	532 - Rental services of movable property	0.93	0.86	Independent
60	533 - Trademark, patent, and franchise rental services	0.68	0.76	Independent
65	611 - Educational services	0.75	0.68	Independent
66	621 - Outpatient medical and related services	0.90	0.68	Independent
67	622 - Hospitals	0.95	0.67	Independent
68	623 - Social welfare and health care residences	0.97	0.67	Independent
70	711 - Artistic, cultural, sporting, and other services	0.81	0.73	Independent
71	712 - Museums, historical sites, zoos, and similar	0.94	0.67	Independent
73	721 - Temporary lodging services	0.90	0.89	Independent
76	812 - Personal services	0.83	0.70	Independent
77	813 - Associations and organizations	0.91	0.71	Independent
78	814 - Households with domestic employees	0.67	0.67	Independent
79	931 - Legislative, governmental, and law enforcement activities	0.89	0.68	Independent

Source: created by the authors based on information from the input-output matrix 2013