THE INFORMALITY IN MEXICO: WHO ARE THE TRUE LOSERS?

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ABSTRACT

In Mexico, more and more people are opting for the informal market as a means of subsistence, a situation that has led to considerable losses in terms of tax collection by the national government, especially income tax and social security. This has motivated us to ask ourselves, how much is being left to collect annually for taxes in this situation? What macroeconomic impact would the Mexican economy have before an exogenous impact in said amount? What impact would such collection have on the well-being of the population and inequality? For this, the National Household Income and Expenditure Survey (ENIGH) and a Social Accounting Matrix (SAM) constructed for Mexico for 2012 are used as a database. For the analysis, the Leontief model extended to an SAM is followed which seeks to determine the impact on the welfare of the population from the equivalent variation and the impact on inequality measured through the Gini Index. This research yields interesting results, which allow to make sound public policy decisions, focused on improving the distribution of income and in turn improving the welfare of the population.

Keywords: Informal economy, Welfare, Multisectoral analysis, Taxes

I. INTRODUCTION

In Latin America, informality is a current theme in the policymakers' agendas and has been addressed in different developing countries and Mexico is no exception. This problem that has been presented for several years, has been increasing, affecting the productivity and economic growth of the country. According to the National Institute of Geography and Statistics (INEGI, 2016), in Mexico around 60% of the Economically Active Population (EAP) is in informality[1].

According to the Program for the Promotion of Formalization in Latin America and the Caribbean (FORLAC, 2014), among the most important economies in Latin America, Mexico has the highest level of informality (60%), followed by Argentina (50%), and Brazil (40%).

This in turn leads to other situations such as shortcomings in labor rights, poverty, lack of social security, job stability, etc. However, informality goes beyond the labor rights approach (Levy, 2007). This could have a direct impact on the productivity and economic growth of the country, including on the welfare of the population and income distribution, from the point of view of tax evasion.

The definition adopted in Mexico and the basis for its measurement is the result of the collaboration of the International Labor Organization (ILO) and the Delhi Group convened by the United Nations to measure this problem. From these two concepts have been generated; On the one hand, there is the Informal Sector that focuses on the characteristics of non-agricultural economic units that do not constitute themselves as companies and that do not comply with the most basic registries that the legislation demands of suppliers of goods and services, such as the ambulatory. On the other hand, there is talk of informal employment and it is related to working conditions that lack guarantees and work without access to social security[2].

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[1] These lack job stability, social security, labor rights, in addition, evade taxes.

[2] INEGI. Labor informality National Survey of Occupation and Employment. Conceptual and methodological framework, 2014.

Among other definitions is that of Soto (2004) that defines the informal economy as those economic activities that do not have a registry, regulation or any control and share the space with other organizations that do.

Many authors have devoted themselves to addressing these issues (Oviedo et al., 2009, Buzzo et al., 2012, Antón et al., 2012). Some of these have coincided that one of the reasons why public policy has not been able to focus adequately, is that the causes that originate informality have not been defined[3]. In Mexico, INEGI, the institution in charge of measuring informality, describes the distribution of workers in a variety of formal and informal jobs. INEGI following this methodology, for 2016 they find that workers in the informal sector are 13.9 million and informal workers in the informal sector are 16 million. Among workers in the informal sector, there are 4.7 million who are employees of some kind, 7.4 million who work on their own and 0.9 million who work as employers.

Bazdresch (2017) describes informality as a natural response of the labor market to excessive and inefficient labor regulation, where the answer is to create value but outside the law. This is the case of those employees who, for reasons of schedule flexibility, decide to leave the formality for convenience. Robles and Martínez (2018) affirm that the formal and informal markets are not mutually exclusive, but complementary.

On the other hand, informality be a form of tax evasion, where the informal sector uses public goods, but does not contribute to its financing. In Mexico, according to the INEGI (2016), 95% of registered companies are microenterprises with 10 or fewer workers, however, most of these establishments are informal whose employees do not have social security.

This has quite important implications; according to Bazdresch (2017), coupled with the lack of labor rights of the informal (social security), there are the high tax rates imposed on the formal market with which a part of the public goods that both formal and informal use are financed. This means that the companies that were formalized prefer to enter the informal sector and stop their growth, which at the same time is reflected in the productivity of the

[3] This is done through the Hussmans matrix proposed by the ILO and the Delhi Group. This is a matrix in which the lines order occupation (persons) and employment (jobs) from the perspective of the nature of the economic units while the columns classify under the "status in employment" approach, position in the work or position in the occupation (INEGI, 2014).

economy, in addition to the erosion of the productive potential of the population. In turn, in the face of a lower collection that serves to finance public goods, the redistribution of income and therefore the welfare of the population would be affected. The latter will be the purpose of this investigation. Among other identified causes of informality, there are excessive regulations, migration from the countryside to the city, inequality of opportunities, among others. However, for Mexico, informality has triggered a low tax collection that according to the Organization for Economic Cooperation and Development (OECD) in Mexico, only 30% of what could be collected is collected.

According to the International Competitiveness Index (ICI, 2017), labor informality threatens competitiveness in Mexico. While the average income of a formal worker is 8,052 Mexican pesos per month, which in turn contributed 76% in the generation of the Gross Domestic Product (GDP), absorbing a little more than 40% of the PEA, the average salary of an informal worker 4,279 Mexican pesos per month with a contribution of GDP of 24%.

Of this total, 11.2% corresponds to the informal sector, that is, to non-registered businesses dedicated to the production of goods and services, and the remainder to other informal activities within economic units other than those not registered, which do not have social security or social benefits.

Regarding informality by productive sector, for 2016 according to INEGI, trade had the highest participation with 31.3% of the total reported, followed by construction with 13.8%, agricultural activities with 12.5% and the industries manufacturers with 12.2%.

The main objective of this research is to determine the impact of formalization of the informal sector on the output of the economy and tax evasion by informality on the welfare of the population and the impact on inequality measured through the Gini Index. For this, a multisectorial model is proposed based on the methodology proposed by Leontief and extended to a social accounting matrix (MCS) built for Mexico, by Beltrán, Delgado and Ríos (2018) called SAMMEX-12.

2. DATABASE AND METHODOLOGY

The methodology selected to analyze the impact of tax evasion by informality is part of the so-called MLEG. These models have shown in different studies that they are adequate to analyze different types of public policies, as has Núñez (2003) who analyzes transfers through a path analysis, Székely & Rascón (2004) which conclude that the period of greater importance in terms of poverty reduction was in the period 2000-2002 and, Aguayo et al. (2009) who analyze the Oportunidades program for the year 2004.

These models allow us to capture all the interdependencies between all sectors of the economy; the effects produced in the endogenous variables due to a change in an exogenous variable, using multipliers. This is thanks to the Input-Product model (MIP) developed by Leontief (1941) but extended to a social accounting matrix (MCS), with which the theory developed by Walras was taken to the empirical field.

To propose these models, following Stone (1978) and Pyatt & Round (1979), first define the accounts that are considered exogenous. Then, a variation in the exogenous accounts is defined and it is observed that it happens with the rest of the accounts that constitute the total of the economy. The exogenous accounts are those that are determined outside the economic system and represent possible instruments of economic policy.

Once the accounts are classified between endogenous and exogenous, we proceed to construct the matrix of average propensities to expense (A_{mm}), which collects the payments made to the account i for each income unit of j.

Next, a vector of exogenous components represented by X_A,X_F, X_P and X_K is added; a vector representing the level of income of the endogenous accounts represented by Y_A,Y_F, Y_P and Y_K, and finally, a payment vector of the endogenous accounts to the exogenous accounts P_A,P_F, P_P and P_K. Where, m and k are the endogenous and exogenous accounts respectively.

Resulting:

$$\begin{bmatrix} Y_A \\ Y_F \\ Y_P \\ Y_K \end{bmatrix} = \begin{bmatrix} C_I & 0 & C_F & I \\ W & 0 & 0 & 0 \\ 0 & R & T & 0 \\ 0 & 0 & S & 0 \end{bmatrix} \cdot \begin{bmatrix} Y_A \\ Y_F \\ Y_P \\ Y_K \end{bmatrix} + \begin{bmatrix} X_A \\ X_F \\ X_P \\ X_K \end{bmatrix} \quad (1)$$

Finally, the matrix is divided into four submatrices $A_{mm}, A_{mk}, A_{km}\ and\ A_{kk}$, being as follows:

$$Y_m = A_{mm}Y_m + A_{mk}Y_k \tag{2}$$

Where, Y_m and Y_k represent the total income of both the endogenous and exogenous accounts and A_{mm} corresponds to the productive activities, which are the technical coefficients obtained with the MIP. Now, Y_m is cleared and the matrix equation is left like this:

$$Y_m = (I - A_{mm})^{-1} \cdot A_{mk} \cdot Y_k \tag{3}$$

$$Y = M \cdot X_m \tag{4}$$

Where, $(I - A_{mm})^{-1}$ is called M and is the matrix of linear multipliers (ML); This matrix shows the impact generated by a unitary increase in the exogenous accounts on the income of each one of the endogenous accounts. On the other hand, we have a $A_{mk}.Y_k$ as X_m and represent the injections of income issued by the exogenous accounts and received by the endogenous ones.

Once you have M, you can also compare the effect of the exogenous impact in terms of GDP, that is, what is the percentage change in terms of GDP caused by a unitary change in the production of the sector. The impact in percentage of sector j on aggregate GDP can be calculated as follows:

$$\Delta PIB_j = \frac{\sum_i \frac{PIB_i}{Y_i} M_{ij} Shock}{PIB} \tag{5}$$

Likewise, it seeks to analyze the impact of the proposals on inequality and poverty. For the first, the Gini coefficient is used and, for the second, the Foster, Greer and Thorbecke index (Foster) is used (Foster et al., 1984), to determine the poverty conditions in which the population in study, as well as their shortcomings in the levels of individual consumption.

The FGT index is an index of deprivation in private consumption, which takes as a reference a specific line of individual poverty, as is a daily minimum wage of the total population and the economically active population. From this the proportion of the population in conditions

of extreme poverty is calculated[4]. Higher values of the FGT index reflect a deterioration in the level of individual consumption satisfaction.

the above is represented by,

$$P_{\propto} = \left(\frac{1}{n}\right) \sum_{i=1}^{q} \left(\frac{z - x_i}{z}\right)^{\propto}; \quad \propto \geq 0 \tag{6}$$

Where, α is a parameter that specifies the sensitivity of the index, z = Poverty line, n = total number of households, xi = household income ith, q is the number of poor households, z-xi = poverty gap of the ith household and (z-xi) / z the standardization of the poverty gap of the ith household.

$\propto$ =0 is the percentage of people in monetary poverty. $\propto$ =1 is the poverty gap, or the average percentage by which the poor must increase their income to overcome poverty. $\propto$=2 is the most interesting measure, a measure of the severity of poverty, or the distribution of per capita expenditures among the poor. The FGT index is expressed as a combination of a measure of inequality, and the ratio of the income gap in a similar way to that of Sen (2000).

Finally, as a measure of income inequality, the Gini Index is taken. This varies between 0 and 1, where 0 indicates perfect equality, that is, all individuals have the same income. On the contrary, a value of 1 refers to perfect inequality, that is, only one individual has all the income and the others do not have any.

The calculation of the Gini Index for this research is done for grouped data (Medina, 2001), where households are ranked first in ascending order according to their income. Subsequently, intervals of equal size are defined, which for this case correspond to income deciles, where each group must concentrate 10% of the observations.

Once this information is defined, we proceed to calculate the Gini Index from one of the expressions that exist for grouped data.

[4] Extreme poverty is defined as the number of inhabitants whose income is below the poverty line on the total population.

$$CG = 1 - \sum_{i=1}^{n} x_i (Y_i + Y_{i+1}) \quad (7)$$

Where, *n* represents the number of groups, x_i is the percentage of population in group *i* and Y_i is the cumulative income in group *i*.

A SAM constructed for Mexico, called SAMMEX-12 by Beltrán, Delgado and Ríos (2018), is used as a database. It consists of 10 types of households represented by deciles of income[5], companies, government, savings-investment account, capital account, work account, 19 productive activities, private consumption and the rest of the world. It also includes taxes on goods and services net of subsidies, wages and salaries, effective social contributions to insurance, other social benefits, net taxes on subsidies on production and other taxes on production, as presented in the table 1.

Table 1. Structure of the SAM for Mexico year 2012. SAMMEX12

Account	Description
1	Agriculture, breeding and exploitation of animals
2	Mining
3	Generation, transmission and distribution of electric powe
4	Building
5	Manufacturing industries
6	Trade
7	Transportation, mail and storage
8	Information in mass media
9	Financial and insurance services
10	Real estate services
11	Services professionals, scientists and technicals
12	Corporate
13	Business support services
14	Educational services
15	Health and social assistance services
16	Cultural and sports entertainment services
17	Temporary accommodation services
18	Other services except government activities
19	Legislative activities

[5] There is a special disaggregation of households, since it is desired to simulate the effects of the formalization of informality on income by deciles of households and the levels of poverty and inequality.

20	Labor
21	Capital
22	Enterprises
23	Private Consumption
24	decil I
25	decil II
26	decil III
27	decil IV
28	decil V
29	decil VI
30	decil VII
31	decil VIII
32	decil IX
33	decil X
34	Effective social contributions to social security
35	Net production taxes
36	Taxes net goods and services
37	Income tax
38	Government
39	Capital account
40	Rest of the World

Source: Own elaboration based on the Input-Output Matrix (MIP) base year 2012 carried out by the INEGI (2014)

3. ANALYSIS AND RESULTS

This section presents the economic effects if the informal sector were formalized, where the Mexican state had the capacity to collect the tax evaded percentage by informality, followed by its effects on inequality and the poverty index according to Foster et al. (1984) from the changes presented in the household income of the first application.

3.1. Economic effect of the formalization of the informal sector. For this first part of the research, first we proceed to identify the vector that will serve as an exogenous shock to impact the accounts considered endogenous. According to San Martin et al (2017), in their research they find that the tax evasion rate of income tax (ISR) and the value added tax (VAT), for 2016 is 19.2% and 16.4% respectively (table 2).

Table 2. Taxes evaded by informality

Tax	Evasion Rate	Avoided proportion
ISR	19.2%	410,410
VAT	16.4%	79,052

Source: Own elaboration based on San Martin et al (2017)

Although tax evasion has been decreasing since the imposition of the Tax Reform of 2014, as shown in table 2, tax evasion continues to present high figures that according to Tovar (2000), this is mainly due to the existence of an informal sector, inadequate tax laws that discourage collection, economic crises, insufficient fiscal controls, or bad distributive practices by the federal government that discourages taxpayers.

It is known that informality has a direct impact on ISR collection, indirectly VAT collection is affected since it taxes all commercial transactions of goods and services. This first part of the investigation will focus on the impact of these two taxes.

On the other hand, to complete the vector that represents the formalization of the informal sector, intermediate consumption of the productive sectors is included in relation to the informal sector, in the same way as it is accounted for by the national accounts and in accordance with the Classification System Industrial of North America (SCIAN). According to the methodology of informal measurement carried out by the INEGI (2017), the production account of the informal sector is composed of three elements that define the production process of the economic units belonging to the informal sector: production, intermediate consumption and value added.

However, to be consistent with the SAMMEX12, the intermediate consumption of the informal sector is used to construct the vector that represents the production of the industrial sector (table 3). This corresponds to the value of the goods and services used as inputs to produce the economic units belonging to the informal sector. This item considers both the raw materials physically integrated to the production obtained and other intermediate consumption expenses that are necessary to carry out the production of goods (INEGI, 2017).

Table 3. Intermediate consumption, informal sector

Account	Productive Sector	Intermediate Consumption
1	Agriculture, breeding and exploitation of animals	-
2	Mining	2,217.19
3	Generation, transmission and distribution of electric powe	-
4	Building	324,224.58
5	Manufacturing industries	316,060.03
6	Trade	89,384.81
7	Transportation, mail and storage	48,019.85
8	Information in mass media	13.49
9	Financial and insurance services	-
10	Real estate services	2,423.05
11	Services professionals, scientists and technicals	5,377.08
12	Corporate	-
13	Business support services	5,592.57
14	Educational services	240.30
15	Health and social assistance services	2,030.73
16	Cultural and sports entertainment services	2,888.48
17	Temporary accommodation services	38,528.19
18	Other services except government activities	33,077.78
19	Legislative activities	-

Source: Own elaboration based on the INEGI (2017)

The exercise lies in impacting the Mexican economy with the amounts presented in tables 1 and 2. For this purpose, endogenous accounts will be defined for productive activities, productive factors, societies and consumers, and taxes collected and tabulated in the MCS. . As an exogenous account, the government, the savings-investment account and the rest of the world are identified. The values used as vector of impact correspond to the year 2016 under the assumption that from 2012 to 2016 the structure of the Mexican economy has not changed.

Table 4 shows the vector X that contains all the injections of income that each of the endogenous accounts receives from the exogenous accounts, that is, it represents the output of the exogenous accounts, the vector XsinInformalidad includes the incomes under the hypothetical scenario of the formalization of the informal sector, the vector Y that contains the total outputs of the endogenous accounts considering informality, and the vector

YsinInformalidad that contains the total outputs of the endogenous accounts under a panorama without informality. Finally, the percentage of variation from a landscape with informality to one without informality.

Table 4 shows that by formalizing the informal sector including its production from the point of view of intermediate consumption to the economy together with the payment of taxes (ISR and VAT), the total output of the economy would increase by 17.12%, which It is equivalent to 4,535,171 million Mexican pesos. This result has very important implications, on the one hand, it is observed that the productive sectors that are mainly benefited are other services[6] (18) with a change variation percentage of 23.46%, temporary accommodation services (17) with a variation of 23.19%, transport, mail and storage (7) with a variation of 20.98%, manufacturing industries (5) with a percentage of variation of 19.64% and generation, transmission and distribution of electrical energy (3) with a change of 18.79%. Likewise, although all sectors present a positive impact, those that generate less exogenous injections are the legislative activities (19) with a variation of 0.81%, educational services (14) with a variation of 3.59% and health services with a variation percentage of 5.29%.

[6] Other services include activities related to repair and maintenance, personal services such as beauty salons, laundries, funeral services, parking, associations and organizations and domestic employees (INEGI, 2007).

Table 4. Variation of total output when formalizing the informal sector (MXN million)

Account	Description	X	XwInformality	Y	YwInformality	% change after shock
1	Agriculture, breeding and exploitation of animals	137535	137535	762888.122	895668.1235	17.33
2	Mining	773582	775800	1582427.954	1840096.411	16.23
3	Generation, transmission and distribution of electric powe	15688	15688	462230.45	552892.8386	18.79
4	Building	1979436	2303660	2285164.545	2663571.137	16.45
5	Manufacturing industries	3494452	3810512	9025226.872	10798865.54	19.64
6	Trade	664528	753913	3103124.661	3664052.943	18.05
7	Transportation, mail and storage	250061	298081	1562270.932	1906590.555	20.98
8	Information in mass media	6562	6575	553572.912	637430.3298	15.11
9	Financial and insurance services	38880	38880	782397.465	902230.8305	15.31
10	Real estate services	27896	30319	1954524.553	2263716.098	15.68
11	Services professionals, scientists and technicals	26376	31753	458301.378	533173.3497	16.29
12	Corporate	0	0	100463.259	118128.3341	17.53
13	Business support services	-78	5514	580521.245	688413.0436	18.56
14	Educational services	550179	550420	708719.786	734164.0745	3.59
15	Health and social assistance services	338768	340799	486127.55	512093.3158	5.29
16	Cultural and sports entertainment services	9417	12306	89712.136	105094.0261	17.08
17	Temporary accommodation services	-342	38186	464423.186	572577.7421	23.19
18	Other services except government activities	-209	32869	428319.811	529318.869	23.46
19	Legislative activities	916239	916239	919248.522	926758.8893	0.81
20	Labor	12203	12203	3910848.588	4439641.457	13.52
21	Capital	0	0	10805151.84	12711517.49	17.64
22	Enterprises	0	0	9670501.143	11376679.04	17.64
23	Private Consumption	0	0	9486501.087	10946963.7	15.40
24	decil I	78638	78638	339976.4146	386326.167	13.63
25	decil II	87440	87440	467010.1883	533000.4548	14.13
26	decil III	88749	88749	562675.8038	644393.3067	14.52
27	decil IV	81418	81418	667577.3726	765112.1201	14.61
28	decil V	81096	81096	800130.4177	920938.0492	15.10
29	decil VI	73188	73188	919842.8976	1060920.302	15.34
30	decil VII	72290	72290	1152941.915	1332156.568	15.54
31	decil VIII	45856	45856	1425103.469	1647590.365	15.61
32	decil IX	46718	46718	1872390.959	2164516.701	15.60

33	decil X	66500	66500	4217188.412	4889388.334	15.94
34	Effective social contributions to social security	0	0	317929.494	342803.7777	7.82
35	Net production taxes	0	0	84631.434	177004.4813	108.76
36	Taxes net goods and services	18265	97317	482026.962	987413.7484	79.56
37	Income tax	0	410410	1002898.51	1169753.009	16.64
	Total	9981333	11340873	74494992	87340956	17.12

On the other hand, we can see how the productive factors (labor and capital) have a significant increase in their output with a percentage of change of 13.52% and 17.64% respectively, as well as the considerable increase in tax collection, especially in the taxes on production (35) with a variation of 108.76% and VAT (36) with a variation of 79.56%.

This in turn implies an increase in private consumption (23) with a percentage change of 15.40% as well as the output of consumers disaggregated by income decile (24-33) with a variation ranging from 13.63% to 15.94%.

These results highlight the importance of the circular flow of income, and how it is possible to boost the economy based on sound public policy decisions. For this case, when formalizing the informal sector, all the levels of production are counted in the economy whose added value is reflected in the increase of both labor and capital, which in turn will generate more output. On the other hand, it is observed how the distribution of income directly affects the output of households, increasing them by a considerable percentage that will be reflected in a greater consumption of goods and services.

The above is proven by the analysis in terms of GDP. Table 5 shows that when the industrial sector is formalized, the Mexican economy would have an increase of 16.46% in terms of GDP, which is equivalent to 2,461,502 million pesos in the same measure.

Table 5. Variation in terms of GDP when formalizing the informal sector (millions of Mexican pesos)

Account	GDP with informality	GDP without informality	% variation in terms of GDP
Agriculture, breeding and exploitation of animals	475 580	558,354	17.405
Mining	1 319 306	1,534,130	16.283
Generation, transmission and distribution of electric powe	228 979	273,891	19.614
Building	1 262 452	1,471,505	16.559
Manufacturing industries	2 649 114	3,169,719	19.652
Trade	2 405 213	2,839,985	18.076
Transportation, mail and storage	854 246	1,042,519	22.040
Information in mass media	339 419	390,836	15.148
Financial and insurance services	471 394	543,593	15.316

Real estate services	1 777 384	2,058,553	15.819
Services professionals, scientists and technicals	342 035	397,913	16.337
Corporate	79 747	93,769	17.584
Business support services	485 096	575,253	18.585
Educational services	623 832	646,228	3.590
Health and social assistance services	330 982	348,661	5.341
Cultural and sports entertainment services	66 137	77,477	17.146
Temporary accommodation services	314 246	387,428	23.288
Other services except government activities	304 298	376,053	23.580
Legislative activities	623 732	628,828	0.817
Total	14,953,192	17,414,694	16.461

Source: own elaboration based on INEGI data for 2016

Table 5 presents the sectors with the greatest impact in terms of GDP, which correspond to the same sectors that presented a significant increase in their total output. This result is also interesting, since according to information from INEGI for 2016 and according to the latest update on the measurement of informality in Mexico, the participation of the informal economy in GDP for 2016 was of 22.6%, so it is not far from reality.

3.2. Effects on welfare. Once analyzed the economic impact of formalization of informality, this impact on the welfare of the population measured in terms of poverty is analyzed through the FGT Index and inequality measured with the Gini Index.

The level of inequality presented in households disaggregated by income decile in the hypothetical case of the formalization of the informal sector and the current state of the Mexican economy is shown in table 6.

Table 6. Analysis of income distribution for Mexico

Decil	Income share	Average quarterly income per inhabitant		
		With Informality	Without informality	Change percentage
I	1.39	1,819.07	2,073.60	13.99
II	2.49	3,250.84	3,719.10	14.40
III	3.37	4,404.77	5,053.29	14.72
IV	4.27	5,566.30	6,399.81	14.97
V	5.28	6,885.08	7,927.85	15.15
VI	6.55	8,541.40	9,840.46	15.21

VII	8.33	10,875.02	12,532.78	15.24
VIII	10.93	14,257.21	16,439.27	15.30
IX	15.99	20,882.56	24,103.64	15.42
X	41.40	53,939.88	62,440.73	15.76
Coeficiente de Gini		**0.505618**	**0.507096**	

Source: Own elaboration with data from the ENIGH (2016) and the CONEVAL (2016)

Table 6 shows that decile X represents 41.4% of total household income in Mexico and decile I only 1.39% of income, showing a high concentration of income that is reflected in the Gini index. Before the formalization of the informal sector, the distribution of income remains at the same level presented before the change with a marginal variation of 0.001. That is, the Mexican economy is still formalized the informal sector, continues to present the same indexes of inequality reflecting an environment of relevant inequity.

Despite this, average per capita quarterly income improves significantly, almost in the same proportion for all income deciles. Decil I presents an increase of 13.99% of its quarterly income per capita, a situation that could improve its purchasing power and therefore the consumption of the population that is classified in this decile. Similarly, deciles II, III and IV, have an increase in their per capita quarterly income above about 14%, and the rest of deciles above 15%, generating the same consequences.

However, through the FGT Index it is possible to analyze the poverty conditions in which a specific population finds itself, as well as the shortcomings in the levels of individual consumption.

The parameter (α) can be interpreted as a coefficient of poverty aversion. The higher the value of α, the greater the emphasis that this index makes on the poorest households among all poor households. For the case of this analysis, the FGT index was calculated for $\alpha = 0$ (head count measure), $\alpha = 1$ (income poverty gap or poverty intensity) and $\alpha = 2$ (severity of poverty) for a panorama with informality and a panorama formalizing the informal sector. For this, the micro data provided by the INEGI was used from the ENIGH for 2016, taking into account the quarterly income of each household, the size of the household, its corresponding weight, as well as the belonging group. In addition, as a basis for the measurement, the average between the rural and urban per capita poverty line of 6,665.66

Mexican pesos (333.27 USD) and the average of the rural and urban extreme per capita poverty line was considered. of 3,438.54 Mexican pesos quarterly (171.93 USD) for the year 2016.

The percentage of change of income proposed is the result of the modeling carried out in the first section of this research, corresponding to the analysis of the economic effects of the formalization of informality, considering only the change presented in households. Table 7 shows the results of the analysis.

Table 7. Per-capita poverty analysis, 2016

With Informality	**Moderate Poverty**			**Xtreme Poverty**		
	Head count	P1	P2	Head count	P1	P2
Aggregate	50.00	21.42	11.96	19.15	6.43	3.11
Without Informality	**Moderate Poverty**			**Xtreme Poverty**		
	Head count	P1	P2	Head count	P1	P2
Aggregate	43.68	17.65	9.58	15.09	4.92	2.34

Source: Own elaboration with data from the ENIGH (2016) and the CONEVAL (2016)

The results from table 7 and based on the FGT Index, show that the levels of poverty, both moderate and extreme, decrease before a formalization scenario of the informal sector. For example, the incidence rate decreases by 6.32%, from 50% to 43.68%, in the same way the intensity index decreases by 3.77% going from 21.42% to 17.65%, finally, the severity index decreases 2.38% passing from 11.96% to 9.58%. On the other hand, extreme poverty also shows a decrease, but to a lesser extent than moderate poverty; the incidence rate decreases by 4.06%, while the intensity and severity index decreases by 1.51% and 0.77% respectively.

With this last simulation, we reach the conclusion that formalizing the informal sector would bring great benefits to the economy, since total output would increase, the productive sectors would benefit, having an impact on the increase in the remuneration of the productive factors that In turn, it is reflected in an increase in the output of households disaggregated by income decile and consumption, so that, in the face of informality, the real losers would be the population.

4. CONCLUDING REMARKS

In this research, an analysis was made of the economic effects of the formalization of the informal sector for the year 2016, taking as a database the MCS built for Mexico, called SAMMEX12 through models based on MCS, and based on these results a analysis of the effects on inequality and poverty through the Gini index and the FGT indexes. Thus, the impact that the formalization of the informal sector would generate on the total output of the economy and on the welfare of households from the point of view of poverty and inequality is identified.

The sectors with the greatest positive impacts to this measure are mainly the tertiary sector (other services, temporary accommodation services and transportation, mail and storage, in order of impact) and the secondary (manufacturing industries and electric power, in order of impact). In terms of GDP, the economy would have an increase of 16.46%, a value not very far from the official data; According to the INEGI and its measurement of informality, the participation of the informal economy in GDP for 2016 was 22.6%.

Also, these results have implications for the distribution of income in the economy. Both private consumption and household output disaggregated by income decile have a significant positive impact, with an average variation of 15%.

For this reason, when formalizing the informal sector, all the levels of production whose added value affects the productive factors are counted in the economy, which in turn generate more output, due to the circular flow of the economy's income. Likewise, the distribution of income directly affects the increase in household output, a situation that is reflected in the increase in the consumption of goods and services.

In terms of household income, decile X accounts for 41.4% of total income, while the decile I only 1.39%, this inequality is supported by the Gini Index which shows that informal or not, concentration of income remains at the same level, reflecting an environment of relevant inequity. However, despite the level of inequality, the average quarterly per capita income improves significantly, with an average increase of 14.5%.

On the other hand, and in terms of poverty, both extreme and moderate poverty rates, measured through the FGT index (incidence, intensity and severity), decrease considerably,

to a greater extent moderate poverty with an average variation of 4.35%, and extreme poverty with an average variation of 2.42% with what can be concluded that formalizing the informal sector brings great benefits to the economy, seeing its total and sectorial output increase; this increase in output would bring with it the increase in the remuneration of productive factors, which directly affects the increase in household output by deciles that impacts private consumption, as well as an increase in tax collection that is supposed to be administered in for the welfare of the population by the federal government.

It is concluded that in the absence of opportunities in the labor market and the unfortunate or misguided collection measures by the federal government have encouraged the search for livelihood on their own, leading to informality that has as its origin different situations and especially a way to evade taxes. However, the benefit is not as expected as shown in this investigation; The lack of formality in the labor market limits profits, since there are no tools or fundamental elements to increase productivity and generate added value. The point would not be to increase taxes and add more tax burdens to taxpayers, but to improve the conditions that encourage the informal to face their tax obligations, which in most cases are discouraged by the inadequate management of resources by of the federal government that ultimately harm the welfare of the population and the performance of the economy in the long term. Therefore, the real losers would be the same population, both informal and formal, since, at the time of the distribution of income in the economy, what is generated by the formal will be distributed even to the informal, even slowing the country's productivity.

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