

En Food Security in the Era of the SDGs So close to the deadline, so far from the targets?. (Suiza): Palgrave Macmillan.

So Close to the Deadline, So Far from the Goal: Anatomy of Food Poverty in 11 Latin American Countries.

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So close to the deadline, so far from the goal. Anatomy of Food Poverty in 11 Latin American Countries

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Abstract

This paper aims to assess the situation of food poverty (FP) in 11 Latin American countries in the period from 2014 to 2022, 8 years from the deadline set by Agenda 2030 for Sustainable Development for the achievement of the Sustainable Development Goals (SDGs). A household experiences food poverty if, in a given period, at least one of its members was unable to access food in the necessary quantity and quality due to lack of money. The concept is equivalent to the moderate and severe gradients of the food insecurity scale (FIES) used by FAO to monitor progress in achieving the SDGs. It also aims to identify the factors associated with food poverty. This second objective leads to understanding the reasons for the differences found and to highlight central aspects for the design and implementation of public policies in this area. The document focuses on Target 1.2 (End Hunger) of SDG-2 (Zero Hunger) of the 2030 Agenda. Around one out of every 3 people in the 11 countries included in the sample live in households with a member affected by food poverty, and 16% by its severe form. The results obtained suggest that although there are common elements associated with food poverty gradients in all the countries, the differences between them are also due to specific factors that should be addressed with specific studies. Such factors can be used by the governments of each nation, or by an alliance of nations, to reduce the prevalence of food poverty and clear the way towards the achievement of SDG-2.

Keywords: Food poverty, Latin America, Hunger, Sustainable Development Goals, Gender.

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I. Introduction

In 2015, on the occasion of the establishment of the 2030 Agenda for Sustainable Development, 193 countries of the world committed to end hunger¹. In particular, target number 1 of Sustainable Development Goal 2 (SDG-2) - Zero Hunger says: "by 2030 end hunger and ensure access by all people, in particular the poor and people in vulnerable situations, including children, to safe, nutritious and sufficient food all year round." The data documented in the 2030 Agenda accounted for this reality: "One in nine people in the world is undernourished today; that is, about 815 million people in the world." It was recently found that the number of hungry people in the world increased to 828 million people in 2021, an increase of about 46 million since 2020 and 150 million since the outbreak of the COVID-19 pandemic (FAO et al., 2022). Population growth, the economic and health shock caused by the pandemic and confinement, coupled with recurrent macroeconomic imbalances in some countries, meant that the achievement of SDG-2 is further away today than at the time it was formulated (2015).

The SDGs and their targets are integrated, that is, the achievement of one of them - for example, "end hunger" - will have impact on the achievement of one or more other SDGs. There is evidence that women are more likely to experience food poverty than men, especially in its moderate form. In line with this finding, working to reduce hunger will have consequences that benefit women more by reducing gender inequalities and contributing to the achievement of SDG 5: "Achieve gender equality and empower all women and girls". On the other hand, there is a relationship between the possession of monetary resources and access to adequate and quality food, although, as will be seen in this paper, it is not a strict relationship. Thus, the reduction of poverty in all its forms, as established in SDG 1, may well translate into improvements in SDG 2. There is a reciprocal relationship between SDG 2 and the one that establishes educational guidelines (SDG 4), where improving access to food allows students to achieve greater attention span and better school performance; at the same time, quality education throughout the life cycle would provide tools to produce and select quality food. The above are only examples intended to emphasize its importance not only in itself, but also as an appropriate means to achieve other Agenda objectives.

Focusing only on food poverty, it is clear that it has multidimensional consequences. In addition to the individual and immediate-term suffering that involuntary hunger implies and that justifies its study, among the economic consequences of total and severe malnutrition, the literature highlights: a negative impact on economic growth (Leibenstein, 1957; Lipton, 1983) and on income distribution (Stiglitz, 1976; Dasgupta & Ray, 1986; Bliss and Stern, 1978; Strauss 1986; Behrman, 1993; among others). One could also add the negative effects on cognitive development, physical activity and, as analyzed in Laraia (2013) and Jones (2017), on mental and physical health. Food poverty have clear effects on individual productivity in the long run. Compounding this concern, food poverty has been associated with poorer management of chronic diseases, such as diabetes (Nelson et al., 2001), whose consequences on work absenteeism, premature mortality and other economic impacts are more than compelling (Jonsson, 1998).

Which factors are behind food poverty? To answer this question, it is crucial to clarify what is meant by food security. At the individual level it could be defined as "physical, social and economic access to sufficient, safe and nutritious food that meets one's daily energy needs and food preferences for an active and healthy life at all times." This definition can be summarized in the four pillars implicit in it, which are useful to approximate the determinants or factors associated with food poverty: a) physical availability of food, b) access, c) utilization and d) stability. Taking these pillars as a starting point, on the supply side it is important to guarantee

¹ Details can be found at: <https://www.un.org/sustainabledevelopment/es/hunger/>.

the level of food production and stock levels (availability); on the demand side, the ability to purchase (access); the possibility of preparing food and absorbing nutrients, the diversity of the diet and its distribution within the household (utilization); the pillars described above must have periodic permanence, and may be interrupted by adverse climatic events, economic crises, among others (FAO, 2011).

Based on all that has been said so far, the main objective of this section is to describe, as accurately as the available data allow, the recent evolution and current situation of food poverty in 11 countries of the region (Argentina, Brazil, Costa Rica, Chile, Guatemala, Haiti, Honduras, El Salvador, Mexico, Peru and Uruguay), and to evaluate the concurrence of certain determining factors. This evidence would be useful for designing public policies that contribute to eliminate food poverty, and thus to achieve the objectives of the 2030 Agenda for Sustainable Development. These are nations that, despite sharing the same continent, have very different levels of human development and per capita income, as well as equally diverse institutional, cultural and political realities. For the analysis of the associated factors, three main axes of analysis will be followed: the gender of the respondent to the food poverty module of the Gallup Survey (the data source used in this paper), the household income level, and the shock caused by the COVID-19 pandemic, in the year 2020. Of course, demographic (household size and composition, for example) and educational factors are taken into account. Although the period of interest is 2014-2022 (due to the availability of homogeneous information), and the number of countries amounts to 11, in some cases the study deviates from this standard by not having the data for all eleven countries, all years. This evidence would be useful for designing public policies that contribute to eliminate food poverty, and thus to achieve the objectives of the 2030 Agenda for Sustainable Development.

The chapter is organized as follows: the next section summarizes the background of previous research strongly related to the present one. Section III presents a conceptual framework that allows us not only to organize the available information, but also to interpret the reasons underlying the correlations found. These correlations are presented in sections IV, from a macro perspective, and V, from a micro perspective. The difference between the "macro" and the "micro" are clarified in section III. These results are discussed in section VI, which also concludes with a summary list of the main findings, the limitations of the study and an agenda for future research.

II. Research on food poverty

The contributions made by Amartya Sen (Sen, 1981) could be used as a demarcation line in studies of the economics of hunger and food poverty. This does not imply leaving aside previous discussions, mainly those carried out by classical economists. Prominent among them are those that arose out of the controversy over the Poor Law in the 19th century. These debates contained much of the material that is used today in studies on hunger. However, the insights of Malthus (1798) and Smith (1776), among other authors of the time, are more directly linked to the role of government aid in situations of food scarcity, and to the origins of scarcity itself. This differs radically from the current situation, in which famines are due to other types of determinants more closely linked to particular social, political and economic situations than to natural events or environmental catastrophes, which were more common in the past. It was precisely Amartya Sen who recognized the specificity of these situations of food poverty, and from his studies and others that followed him, food was recognized as a human right, and the lack of access to food as a violation of its effective exercise.

The background information most directly related to the objective of this paper is found in reports by the Food and Agriculture Organization of the United Nations (FAO)². In this regard, the launching of FAO's Voices of the Hungry project deserves a separate mention, since in this context the Food Insecurity Experience Scale (FIES) was developed by asking people directly about their food access experiences. Precisely the data used in this paper come from the FIES. The main monitoring of the global situation are the reports based on the Global Hunger Index, an important tool designed to measure and monitor the level and distribution of hunger at the global, regional and national levels.

In addition to this global and macro approach to food poverty, those that emphasize determinants related to households and individuals have been gaining ground in the literature. Research by Feleke et al. (2005), Duffy & Zizza (2016), Aceves-Martins et al. (2018) and Broussard (2019), Dudek & Myszkowska-Rygiak (2020) approach the problem of food security from the perspective of microeconomic theory, emphasizing behavioral modelling and subjecting the theory's predictions to empirical testing. Feleke et al. (2005), for example, developed recursive models of household food security appealing to consumer demand and production theory. They find that an increase in aggregate per capita production does not necessarily translate into food security at the household level. On the supply side, they highlight the role played by technology in Ethiopia's farming households. They find a positive and significant relationship between technology adoption and household food security: those who adopt improved technology are more likely to be food secure than those who do not.

Duffy & Zizza (2016) and Dudek & Myszkowska-Rygiak (2020) use specific empirical instruments to evaluate programs designed to combat the problem of hunger. The first study was focused on the USA and the second on Poland. Another empirical study, Broussard (2019), introduces gender into these discussions. This author uses a methodology similar to the one used in this paper (see section V), but unlike the use of that strategy in this study, Broussard (2019) applies it to assess the gender gap. Aceves-Martins et al. (2018) oriented their research to program evaluation emphasizing on children. Here again, the role played by household strategies is emphasized, and they operate independently of national or global productive forces in terms of greater or lesser food production. It should be noted that none of these studies minimizes the importance of food production, but simply focuses on identifying gaps according to household characteristics that can help in the design of policies that contribute to greater equality in access to healthy and continuous food.

Studies for Latin America are scarcer than those for other regions in the world. Sometimes, the region is included in more global studies, such as those carried out using FAO-FIES data. The results obtained in these studies will be commented on later when discussing some of the findings presented here. However, we highlight the work done by Smith *et al.* (2017), who find that of the set of determinants associated with a higher probability of experiencing food poverty, low levels of education, limited social capital and residing in a country with a low GDP per capita stand out. These authors also suggest the need for a change in short-term strategies and greater long-term efforts that contribute to sustaining the productive capacity and employment of households to promote sustained economic growth and a systematic reduction in food poverty.

On the other hand, there are studies conducted in specific countries: Brazil, Costa Rica, Mexico, Uruguay and Argentina. These investigation find that food poverty is positively associated with (monetary) poverty, residence in extended households, low educational level of the household's reference person, and migration status (Shamah-Levy et al., 2014; Caravaca Rodríguez & Ugalde Montero, 2021). A variable with a strong impact on food poverty is household income. This is

² The latest report is FAO et al. (2022). Previous reports can be obtained from the FAO website: <http://fao.org>

one of the elements that motivated to dedicate a good part of this study to household income and its relationship with food security. Another determinant associated with food poverty is the presence of children in the household (Prada *et al.*, 2021). Regional differences were also identified in the incidence of food poverty, an inequality that is reinforced by economic crises (de Souza Cherol *et al.*, 2023; Hoffmann, 202). For Argentina, it was found that in the phases of increasing food poverty, the explanatory power of household factors (gender, age, education and household income) explained a small part of the total change, while in the phase of decreasing food poverty, it was the distributional structure of income that explained the entire change. A large and significant increase in the prevalence of severe food poverty was also observed in that country in households with single women with children, compared to the other types of household structures (single person, adults with children, etc.). This is a result that deserves attention because of its importance for the elaboration of public policies. A disturbing trend in the gender differential was also detected (Paz, 2022).

In sum, factors such as the gender of the household's reference person and income are very relevant for understanding the levels of food poverty found in the countries. As mentioned, household income is one of the determinants most strongly associated with food poverty. Although the probability of suffering food poverty is lower the higher the household income, the relationship is not strict. In other words, being income poor is not synonymous with food poverty. It has been found that a proportion of people with insufficient income to cover a basic food basket (i.e., income poor) live in food security; and vice versa, people not identified as income poor live in food poverty. This incongruence may be due, for example, to the existence of other sources of food beyond purchases, for example, cultivation for self-consumption or provision in community spaces, which are not considered in the calculation of monetary poverty. These two factors, in addition to the structural ones (called here "macro") will be analyzed with special emphasis, for a group of countries in the region.

III. Conceptual framework

Food scarcity and hunger are topics that have a long tradition in economic analysis. The question that gave rise to the theoretical speculations is very basic and elementary: why do people go hungry? The answers, however, generate a certain controversy that can be systematized in the theories that emphasize the role of food supply and those that focus on the population's access to food. The first interpretation has its origin in the most widespread version of the Malthusian thesis, which accounts for some of the famines that have occurred throughout human history: famines are typically explained in terms of the decline in food availability and by the arithmetic that arises from comparing population growth with the increase in food production. Although Smith (1776) mentions availability as a central explanatory element of famine, he clarifies that famines find their ultimate cause in the actions of governments to address the lack of food availability.

Sen's (1981) theoretical shift in economic analysis consists of separating the problem of food availability from the population's possibilities of access to food. More specifically, this author's hypothesis posits the disconnection between income and food availability. Food deprivation can be caused by shortages in food production, but also by cuts in income and by reductions in the population's purchasing power. The disconnect exists because in the absence of market mechanisms, monetary income can be substituted by self-produced consumption, or by income from food stamp benefits, or from social policies that allow access to food. This leads to focus attention on demand factors, in addition to supply factors. In the words of Sen (1981): "Hunger is the situation faced by some people who do not have enough food to eat. It is not a situation of lack of food. While lack of food may be a cause of hunger, it is only one of many possible causes."

A detailed examination of several famines, mainly in India, allows Sen (1981) to support the disconnection hypothesis. For example, he showed that during the Bengal famine (1943) food production was only slightly lower than in the previous year and higher than in other non-famine years. He also mentioned what happened in Africa in the early 1970s, situations in which there is only a weak correlation between food production and famine: during the Ethiopian famines of 1972-74 food production was only down by single digits. Sen showed that, even in the Sahel (1973) and Bangladesh (1974), climatic factors fall short of explaining why people went hungry.

On the demand side, food poverty causes are classified as direct, such as the availability of income, or indirect, such as access to the labor market, segregation and discrimination, and the demographic structure of households. Also included here is the possibility of access to social protection programs for children. Considering the group of people aged 60 and over separately connects the problem of food poverty to the social security system, given that the main source of income of the elderly comes from retirement and pensions.

IV. Food Poverty in Latin America: Macro Approach

The analysis in this section focuses on the countries for which FAO-FIES data are available. These are 11 nations over the period 2014-2022, although information is not available for all of them, for all years. Table 1 summarizes some indicators that allow us to obtain a first picture of the problem from this macro perspective.

Table 1. Some key indicators, 11 Latin American countries, 2014-2022

Country	First year	Last year	GDP per cápita 2022 (U\$S PPP)	People with moderate and severe food poverty (%)	People with severe food poverty (%)	Total population (estimate 7/31/2022) – (Thousands)
Argentina	2014	2022	13,802	32.1	16.6	45,510
Brazil	2014	2022	9,071	25.7	8.6	215,314
Chile	2020	2021	15,368	18.0	7.2	19,604
Costa Rica	2014	2021	13,404	23.7	9.2	5,181
El Salvador	2014	2022	5,127	46.6	22.7	6,336
Guatemala	2014	2020	5,323	50.3	24.4	17,844
Haiti	2021	2022	1,619	86.7	40.2	11,585
Honduras	2014	2022	3,039	55.6	33.1	10,433
Mexico	2014	2019	11,485	33.2	13.8	127,504
Peru	2014	2021	7,126	44.2	23.1	34,050
Uruguay	2014	2021	20,832	23.0	10.5	3,423
11 countries			9,549	40.5	19.5	496,783

Note: The value of moderate and severe food poverty and severe poverty correspond to the entire period for which the countries have data.

Source: Prepared by the authors with information from FAO-FIES and ECLAC, CEPALSTATS.

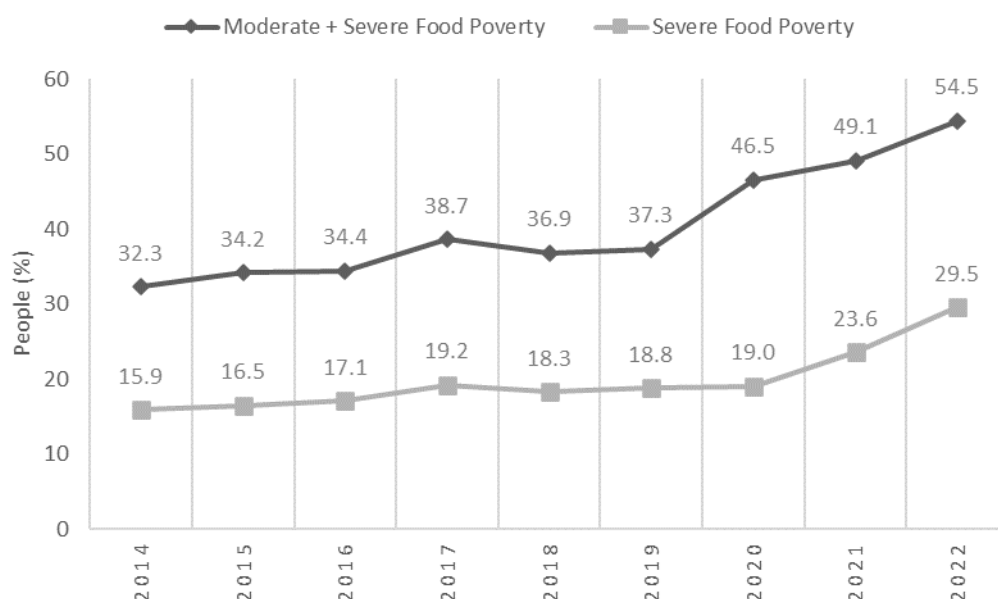
The inhabitants of the 11 countries considered in Table 1 represent 75% of the region's total population, estimated at some 660 million in mid-2022. About 200 million people in Latin America experience moderate and severe food poverty (also called “total”, or TFP) and 97 million suffer from severe food poverty (SFP). In terms of population size rather than prevalence rates, almost half of the region's people with TFP (48.6%) and 37% with SFP reside in Brazil and Mexico. At first glance, a close and inverse association between the level of GDP per capita and

those of food poverty can be seen. Thus, the country with the highest GDP per capita, Uruguay, has the lowest level of food poverty, while Haiti, the country with the lowest GDP per capita, has the highest level of food poverty.

There is a group of nations clearly differentiated by levels of food poverty in all its gradients. On the one hand, there are: a) Brazil, Costa Rica, Chile and Uruguay with comparatively low levels (below 25%); b) Argentina and Mexico (30%); c) El Salvador, Guatemala and Honduras (levels between 40% and 49%); d) Haiti and Peru (levels above 50%). Haiti is perhaps the most pressing case, with more than 88% of its population living in moderate and severe food poverty and 42% in severe food poverty. These differentials suggest that identical public policies cannot be designed for so much heterogeneity and that this heterogeneity is due to different determinants, as are the different productive and social structures of the countries considered in Table 1.

Table 1 made it possible to discern the food poverty situation in the region and its apparent relationship with per capita GDP, an indicator of the economic situation of each country. It also gave an approximate idea of the millions of people who are currently facing this situation. However, those data do not account for the changes that occurred over the period under consideration. Figure 1 summarizes data on the prevalence of total (moderate and severe) and severe food poverty for the 11 countries in the sample analyzed.

Figure 1. Latin America, 11 countries, moderate + severe (total), and severe food poverty (FP), 2014-2022



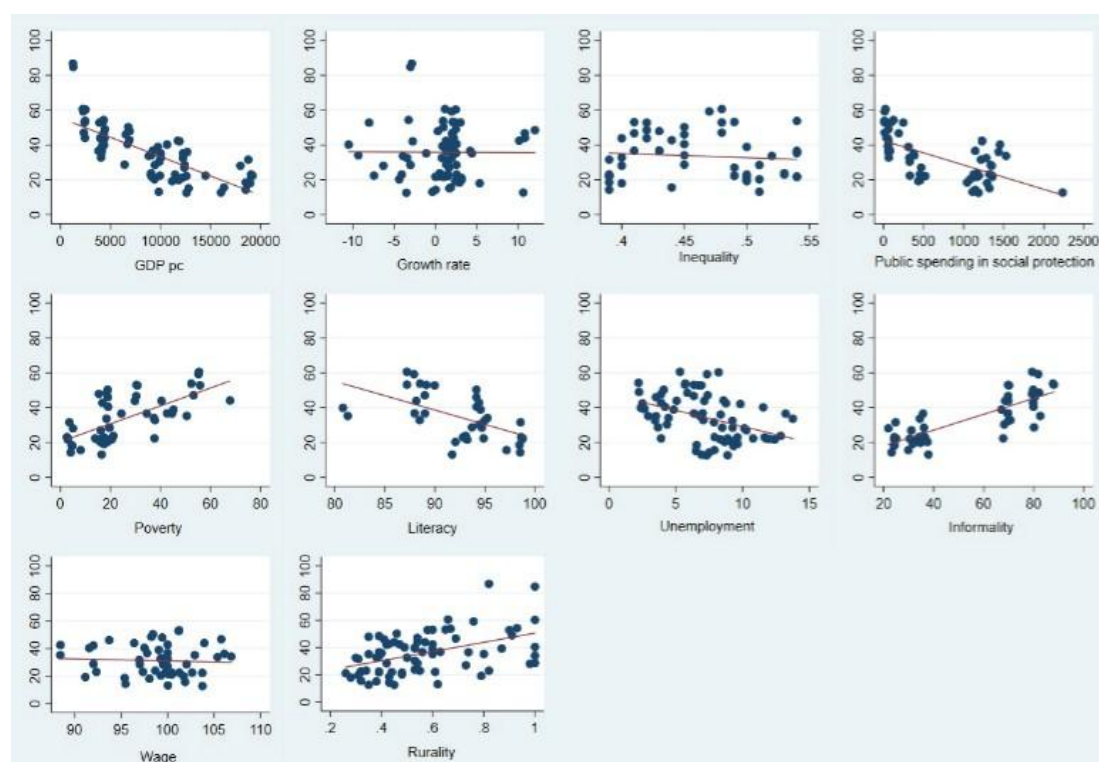
Source: Own, with data from FAO-FIES.

Both poverty gradients experienced a similar path, although with different intensity. In sum, prevalence remained unchanged during the first five years, 2014-2019, and then began to increase, a process that did not stop until 2022, the latest available information. It was the percentage of people situated between severe and total food poverty that experienced an ostensible break in 2020, while severe food poverty only changed its temporal stability one year later. Several events occurred during the period, but the COVID-19 pandemic seems to be associated, at least temporarily, with the recent evolution of food poverty. It is precisely in that year that the rise begins and does not stop until the end of the period.

As can be seen at a first glance, a country's production and wealth, approximated by GDP per capita, have a negative correlation. The correlation coefficient is -0.75, which shows how close the relationship is, but it should be noted that this relationship is not strict, since it can be seen that even in the richest countries there are positive levels of food poverty. To evaluate this and other types of associations, Figure 2 was constructed. The first panel shows precisely the relationship between GDP and food poverty. Then, in a clockwise direction, correlations can be seen between food poverty and, in that order, the per capita GDP growth rate, the Gini coefficient, public spending on social protection, poverty, literacy, the unemployment rate, labor informality, the average wage, and the percentage of the population living in rural areas (or rurality).

The individual panels in Figure 2 provide a clear idea of those factors associated with food poverty and those that seem to have nothing to do with food poverty. In the first group are, as mentioned, GDP per capita, protection spending, unemployment rate, wages, labor informality, poverty and the participation of the rural population. In the group of apparently unrelated ones we have macroeconomic performance (represented by the GDP growth rate) and income inequality (Gini coefficient). Since this is a coarse test of correlation, it is likely that some of these variables, mainly economic inequality, is subsumed under some other variable, such as labor informality and social protection expenditures. Regardless of that, Figure 2 is very illustrative in intuitive terms and allows a first approximation to the problem.

Figure 2. Relationship between food insecurity and its associated factors. Selected countries, 2014-2022.



Source: Own, with data from FAO-FIES and ECLAC, CEPALSTATS.

Counter-intuitive cases are also of analytical interest. Thus, for example, Figure 2 reveals that unemployment has a negative relationship with food poverty: higher unemployment means lower food poverty. But it is very clear that unemployment does not always reflect the core problems of labor markets, especially in middle- and low-income countries, where labor informality is highly prevalent. Note that Brazil is the country with the highest level of

unemployment among the countries observed (a rate of 13.8% in 2020), and the countries with the highest levels of food poverty are Honduras, Guatemala, El Salvador and Peru, where unemployment is much lower. The Latin American region is characterized by a limited unemployment insurance system (Velásquez, 2010), where the labor market insertion of less qualified workers tends to be resolved through the informal sector. This is shown by the strong correlation between labor informality and food poverty of 0.82. In the same direction, countries with higher levels of monetary poverty and rurality also have higher levels of food poverty, with a correlation of 0.65 and 0.46, respectively.

The intuitively correct results are strong and, as will be seen in the next section, robust at the micro (household) level. Education and public spending on social protection, for example, show a strong and negative correlation with food poverty. The correlation coefficients show this: -0.57 and -0.64, respectively. What is interesting is that the value assumed by these variables depends on public policy decisions, so there is a link between these decisions and food poverty, too.

Figure 2 was constructed taking into account the sample countries available in each year. But given the great heterogeneity between nations that had been marked when analyzing the data contained in Table 1, it is necessary to identify the processes in a spatially disaggregated manner, as is done in Table 2. The period centered around the year 2020 was taken there, trying to distinguish the recent evolution of food poverty in the region during and immediately after the pandemic.

Table 2. Moderate + severe, and severe food poverty. Selected countries, 2019-2022.

Country	Total (moderate + severe) FP				Severe FP			
	2019	2020	2021	2022	2019	2020	2021	2022
Argentina	43.9	36.2	38.4	34.8	24.8	19.4	20.0	18.1
Brazil	22.8	31.1	34.1	30.2	5.9	11.9	17.4	12.3
Chile		21.1	14.6	18.3		8.5	5.7	7.4
Costa Rica	25.6				9.0			
El Salvador	49.3	57.5			27.6	23.7		
Guatemala	55.6		49.1	60.9	35.5		18.6	45.0
Haiti			85.1	88.3			38.3	42.0
Honduras	38.4	31.3			19.2	17.4		
Mexico	47.1		51.0		26.5		30.6	
Peru	51.0	53.7	49.0	48.3	29.9	17.9	26.4	31.0
Uruguay	22.8	25.0	20.9		9.5	12.8	11.3	
11 countries	37.3	46.5	49.1	54.5	18.8	19.0	23.6	29.5

Source: Own, with data from FAO-FIES.

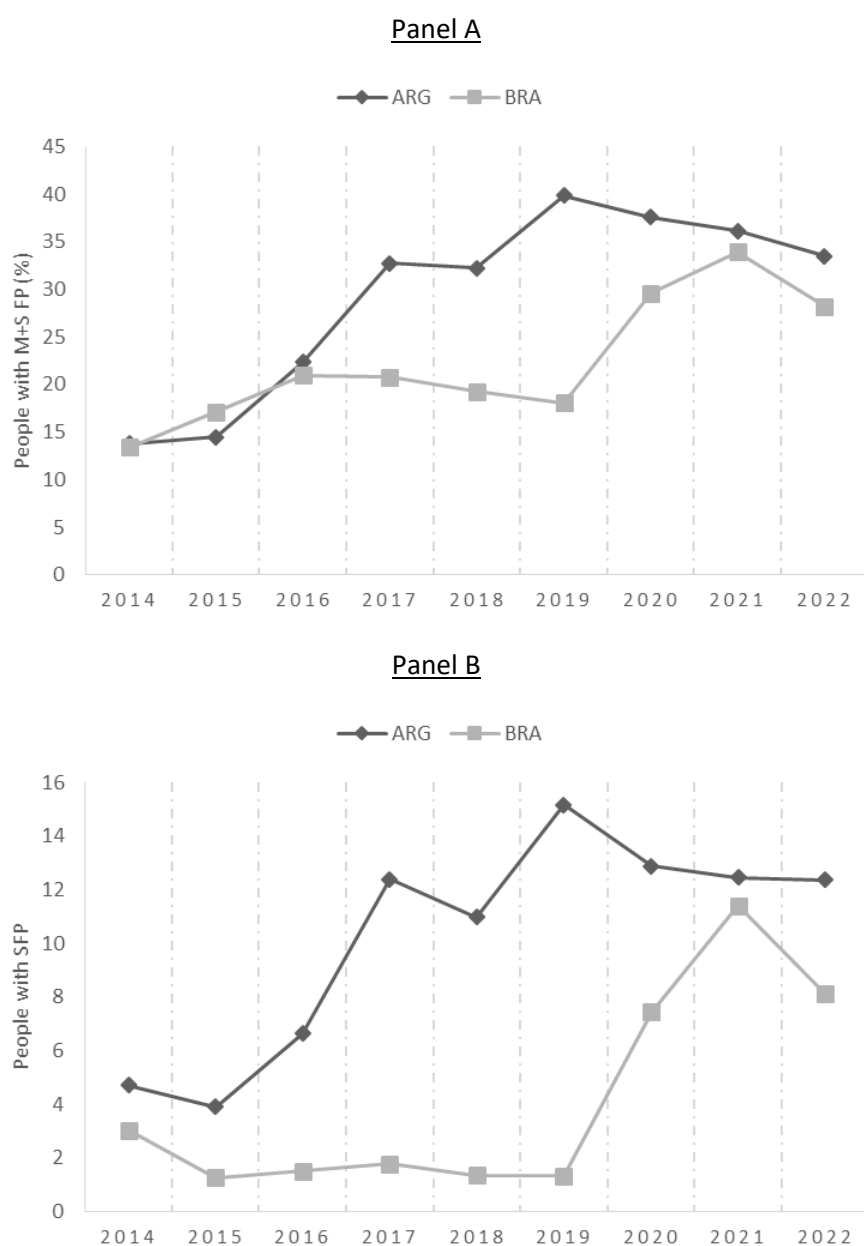
Table 2 shows that disaggregation is relevant: the countries had different changes. Data in the last row of Table 2 (total 11 countries) show the regional situation, while the diversity of situations can be seen in the rest of the rows. Due to the absence of data, nothing can be said about Costa Rica and Haiti and for the rest of the nations there is fragmentary evidence, except for Argentina, Brazil and Peru. The analysis that follows is based on these countries.

In four of the six countries that have data for 2019 and 2020, an increase in food poverty is observed. They are Brazil, El Salvador, Peru and Uruguay. Only Argentina and Honduras recorded a decrease in 2020 with respect to the values recorded in the previous year. In terms of intensity, the average increase was similar to the average reduction, but given that this is a weighted average, the intensity of the increase in Brazil (36%) weighs more heavily than those recorded in Peru and Uruguay. It is now necessary to look at what will happen in the period immediately following: 2020-2021. Two difficulties are found there: fewer countries to make comparisons and countries in some cases different from those that had data for 2019-2020. Here again, in some cases unexpected situations can be seen, among them, in Brazil food poverty continues to increase, and in Argentina there is a slight increase that places it below the level reached in the

pre-pandemic year. These developments merit a particular examination of these two countries which, beyond their geographic proximity, have implemented very different public policies to prevent infection and avoid morbidity and mortality from COVID-19.

Precisely, the differences observed between Argentina and Brazil, require a separate examination for several reasons: (a) together with El Salvador, they are the only countries in the region that have complete information for the period 2014-2022; (b) both started with an identical level of moderate and severe food poverty or total food poverty (TFP) and very similar severe FP (SFP); (c) their evolution was clearly divergent over the years; and (d) from the time of the pandemic their evolution was also disparate which reveals differences in public policies aimed at mitigating the food poverty problem caused by this external shock. Figure 3 illustrates the above mentioned items a) to d).

Figure 3. Evolution of moderate + severe food poverty (panel A) and severe food poverty (panel B) in Argentina and Brazil.



Source: Own, with data from FAO-FIES.

In Argentina, both types of food poverty had sustained growth from 2015 to 2019, with a decline observed thereafter even in the critical year of the pandemic (2020) and in the following year. In Brazil, the dynamics were different: the increases in both types of food poverty were only observed starting in 2019 and decreased slightly in 2022. The highest levels were observed in 2021, probably as a consequence of the COVID-19 pandemic.

Which of the observable factors help us to understand what may have happened in terms of food poverty evolution? Of these factors, the relatively lower educational level of the Brazilian population and the higher percentage of people residing in rural areas stand out. Argentina, compared to Brazil, has a higher percentage of individuals residing in single-person households and a markedly lower percentage residing in households with children. Single-person households have lower levels of food poverty and households with children have a higher prevalence, mainly if they are headed by women. The rest of the variables (gender and age) show no significant differences. Judging from the values of this group of variables, we would expect a lower prevalence of food poverty in Argentina than in Brazil. Incidentally, the variables available in the database used do not allow us to investigate factors related to the evolution of the price level and the population's income, both of which are key to understanding the trajectory of food poverty and the differences observed between the countries compared.

V. Food Poverty in Latin America: Micro Approach

This section examines the hypothesis according to which food poverty gaps are verified by gender and income, and that these vary according to the gradient declared by the person answering the FAO-FIES questionnaire. In all cases, 5 regressions were estimated for 4 groups. The four tables are reported below, one per gradient: concern (Table A1- Appendix), changes in food quality (Table A2- Appendix), quantity restrictions (Table A3- Appendix) and hunger (Table A4- Appendix). The 5 regressions differ from each other by the controls included in each of them and are defined in the columns of each of the tables: gender only (column 1), gender and income quintiles (column 2), gender, income quintiles and individual factors (column 3), gender, income quintiles, individual and demographic factors (column 4), and gender, income quintiles, individual factors, demographic and contextual factors (column 5).

It can be seen that there are no gender differentials for the lowest food poverty gradient (concern), regardless of the controls included in the regressions. The quantity and quality gradients show the strongest gender differentials, although there are clear differences between them. Although in both cases food poverty is higher for women compared to their male counterparts, in the gradient that captures changes in food quality (Table A2- Appendix) the gender gap narrows when controls are included, suggesting some correlation between gender and other determinants (age, education, etc.). When taken into account in the gradient that captures changes in food quantity (Table A3- Appendix), the gender gap remains unchanged and is robust to the introduction of controls. This suggests that gender operates independently of the rest of the variables included in the regressions. Finally, in the most severe form of food poverty (Table A4- Appendix), FP is found to be higher in males than in females, and, as in the case of quantity restrictions, the result is robust to the model specification.

Regarding income, it can be seen that quintiles II and III register higher food poverty in the worry gradient and, quintile V lower food poverty than quintile I (reference group) (Table A1- Appendix). For the rest of the gradients, income operates in the expected direction: food poverty decreases as income increases and acts more strongly for the most severe form of food poverty (Table A4- Appendix). The quality gradient appears to be significantly lower in quintiles IV and V, but no significant differences are recorded between quintiles II and III compared to the reference group. The most severe gradients, adjustments in quantity (Table A3- Appendix) and a day without eating (Table A4- Appendix) appear robust to the controls (different columns of

the tables), although in both cases the force with which the increase in income acts decreases in models that include more controls. This implies that there are interactions between other independent variables and the income strata declared by people.

Women and men do not differ in terms of concern about lack of access to food. The differences in the intermediate gradients, adjustments in quality first and then in quantity, affect women more than men, while the most severe forms affect men more than women. According to the literature consulted, the higher food poverty in the intermediate gradients could be due to the higher commitment to household chores in societies such as Latin America, in which work specialization by gender is more pronounced. This would make women aware of the problem and anticipate episodes of food poverty. It is also likely that there is some type of connection between gradients and that women, when anticipating more severe forms of food poverty, implement preventive measures that allow them to reduce the probability of experiencing SFP.

Income is inversely associated with the probability of experiencing FP, although not across all gradients. Concern about lack of food is greater in the intermediate quintiles. For the rest of the gradients (lower and higher), income reduces the probability of experiencing food poverty and does so even more as the severity of FP increases. The main message here is that money does not eliminate the probability of experiencing food poverty; reduces it, in some gradients more than in others, but in some cases an increase in income is accompanied by a higher food poverty, as occurs with less severe forms of it. This is a result to be taken into account by public policy. Income transfer programs or those aimed at reducing monetary poverty should consider that this does not automatically imply 1:1 eradication of food poverty.

VI. Discussion and Conclusions

Although there is great interest in knowing the effects of economic growth and income distribution on outcomes such as food poverty, the availability of data at the level of smaller units of analysis seems to have encouraged researchers to delve deeper into micro over macro determinants. However, research such as that carried out by Smith et al. (2017) found that the three determinants associated with the greatest increase in the probability of experiencing food poverty in Latin America and the Caribbean in the period examined by them are the low levels of education of the population, limited social capital, and residing in a country with low per capita income. Clearly, these results suggest the need to promote the education of the most vulnerable, encourage social interactions that help build people's social capital, and adopt gender-sensitive programs. These findings also suggest replacing short-term policies with long-term strategies to sustain the productive capacity and employment of households and achieve sustained economic growth.

An interesting attempt to connect information from large micro-level databases with macro-level variables is that of Barlow et al. (2020). The method of analysis is very similar to the one applied in this paper, but the difference is that these authors examine the association between trade liberalization policies and food poverty at the individual level. They also ask about the nexus of this association by country income and household income groups. The results are analogous to those that emerge from the results presented in section IV: there is no statistically significant correlation between trade liberalization, trade policy and moderate-severe or severe food poverty.

Regarding micro differences by gender, the results found here for the countries of the region can be compared with those reported by Broussard (2019) for all regions of the world. In addition to presenting data, it is interesting to develop the conceptual reasons that explain gender differences. Thus, one of the reasons appears to be the absence of a partner in households in which women report as responsible for the household. In these households, the

presence of a spouse is markedly lower and, consequently, the percentage of women is higher than that of men in the following conditions: separated, widowed and single. It is easy to imagine that this has an impact on the possibility of female-headed households to experience deprivations and, among them, the most serious: those related to the provision of food.

In almost all studies addressing micro determinants, the greater propensity of separated, divorced or widowed people to experience food poverty is noted. Grimaccia & Naccarato (2022) posit interactions between gender and marital status and find that these interactions for Central Europe are significant, suggesting a lower number of food poverty events for married and divorced women. The literature mentions as important the difference by gender in moderate and severe food poverty and only in severe food poverty, considered separately. On this issue authors such as Broussard (2019) Dudek & Myszkowska-Ryciak (2022) argue that gender differences for mild levels of food poverty (compared to more severe) could be due to differences in the willingness of men and women to respond affirmatively to experiences of food poverty, such as worrying about having enough food, before more severe ones appear. Differences in the willingness of men and women to respond affirmatively to less severe food poverty issues could be due to women's greater role in the provision and preparation of household food resources and, therefore, potentially being more aware of food security issues before they become more severe.

Within the same line of argument could be the reluctance of men to report less severe experiences due to shame, pride or other reasons, lessening the actual severity of food hardship. Random underreporting of food poverty should not bias the estimates, however, if underreporting of food poverty is systematically different between males and females, then the estimates from the regressions could be biased. While it is not possible to directly test for the degree of underreporting, one can indirectly analyze a gender bias by restricting the sample to the subset of individuals who were classified as moderate or severe food poverty. It can thus be investigated whether men who were classified as food poor were less likely to respond affirmatively at the severe level than women.

The most important limitation of the study presented here refers to the number of variables available in the database provided by FAO for research use. An attempt was made to remedy this by coupling the microdata with information from other sources, such as ECLAC, but at the country (macro) level. It would have been enriching to have the complete Gallup database, which includes additional information such as the income of the individual's surveyed and other information such as the social capital endowment of the people included in the sample. These data would have considerably broadened the analytical content of this proposal.

As an agenda item, it would be very interesting to use country data to contrast other hypotheses that emerge from the literature reviewed and the conceptual framework outlined above. For example, section II mentioned the importance of available time as a key determinant of food poverty. Households allocate their limited resources between food and other needs-wants. Competing demands on resources may arise at the individual, household, neighbourhood and community levels. At the individual level, chronic illness, with associated costs, has been found to increase the likelihood of food poverty (Berkowitz et al., 2014; Tarasuk et al., 2013). Competing demands on the time of the primary food preparer would affect food poverty through the household production process that transforms raw ingredients into meals. In this regard, Coleman-Jensen et al. (2017) found that households in which the household head has multiple jobs with different schedules are more likely to experience food poverty than similarly situated households in which the household head has a full-time job. She postulates that vulnerability could arise from either unstable income or a complicated schedule.

These elements could be incorporated by making use of databases at the country level. Several countries in the region have already incorporated the food security module into their household

surveys, thus increasing the possibility of gaining a better understanding of this phenomenon, which is a major, if not the major, challenge for public policy in this century.

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Tables Appendix

Table A1. Parameters of logistic regression (Odd Ratios). Dependent variable: Worry.

Independent variables	(1)	(2)	(3)	(4)	(5)
Women=1	1.032 (0.041)	1.013 (0.041)	1.014 (0.041)	1.021 (0.042)	0.969 (0.040)
Income quintile					
II		1.140** (0.071)	1.104 (0.069)	1.076 (0.067)	1.184** (0.078)
III		1.170*** (0.070)	1.121* (0.069)	1.097 (0.068)	1.187*** (0.078)
IV		1.041 (0.062)	0.992 (0.062)	0.967 (0.062)	1.074 (0.073)
V		0.834*** (0.051)	0.788*** (0.052)	0.772*** (0.056)	0.823*** (0.061)
Controls variables					
Individuals,	No	No	Yes	Yes	Yes
Demographics	No	No	No	Yes	Yes
Residential and year	No	No	No	No	Yes

*** p<0.01, ** p<0.05, * p<0.1

Table A2. Parameters of logistic regression (Odd Ratio). Dependent variable: Quality.

Independent variables	(1)	(2)	(3)	(4)	(5)
Women=1	1.256*** (0.040)	1.227*** (0.040)	1.221*** (0.040)	1.218*** (0.041)	1.149*** (0.039)
Income quintile					
II		1.131** (0.055)	1.128** (0.055)	1.105** (0.054)	1.062 (0.055)
III		1.197*** (0.057)	1.192*** (0.057)	1.155*** (0.057)	1.089* (0.056)
IV		0.980 (0.047)	0.979 (0.048)	0.956 (0.049)	0.917* (0.048)
V		0.783*** (0.039)	0.791*** (0.042)	0.782*** (0.044)	0.712*** (0.041)
Controls variables					
Individuals,	No	No	Yes	Yes	Yes
Demographics	No	No	No	Yes	Yes
Residential and year	No	No	No	No	Yes

*** p<0.01, ** p<0.05, * p<0.1

Table A3. Parameters of logistic regression (Odd Ratio). Dependent variable: Quantity.

Independent variables	(1)	(2)	(3)	(4)	(5)
Women=1	1.267*** (0.027)	1.191*** (0.026)	1.179*** (0.026)	1.169*** (0.027)	1.272*** (0.030)
Income quintile					
II		0.704*** (0.022)	0.731*** (0.023)	0.751*** (0.024)	0.941* (0.033)
III		0.557*** (0.017)	0.599*** (0.019)	0.638*** (0.021)	0.779*** (0.027)
IV		0.422*** (0.014)	0.470*** (0.016)	0.511*** (0.018)	0.581*** (0.022)
V		0.232*** (0.008)	0.276*** (0.010)	0.310*** (0.012)	0.351*** (0.014)
Controls variables					
Individuals,	No	No	Yes	Yes	Yes
Demographics	No	No	No	Yes	Yes
Residential and year	No	No	No	No	Yes

*** p<0.01, ** p<0.05, * p<0.1

Table A4. Parameters of logistic regression (Odd Ratio). Dependent variable: Hunger.

Independent variables	(1)	(2)	(3)	(4)	(5)
Women=1	0.927*** (0.026)	0.854*** (0.025)	0.846*** (0.025)	0.827*** (0.026)	0.926** (0.029)
Income quintile					
II		0.625*** (0.024)	0.684*** (0.027)	0.721*** (0.029)	0.717*** (0.031)
III		0.390*** (0.016)	0.458*** (0.019)	0.500*** (0.022)	0.481*** (0.023)
IV		0.322*** (0.015)	0.409*** (0.020)	0.443*** (0.023)	0.385*** (0.020)
V		0.150*** (0.008)	0.223*** (0.012)	0.234*** (0.014)	0.208*** (0.013)
Controls variables					
Individuals,	No	No	Yes	Yes	Yes
Demographics	No	No	No	Yes	Yes
Residential and year	No	No	No	No	Yes

*** p<0.01, ** p<0.05, * p<0.1.