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Logistics, food price, food loss, and diet diversification affecting undernourishment worldwide

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INTRODUCTION

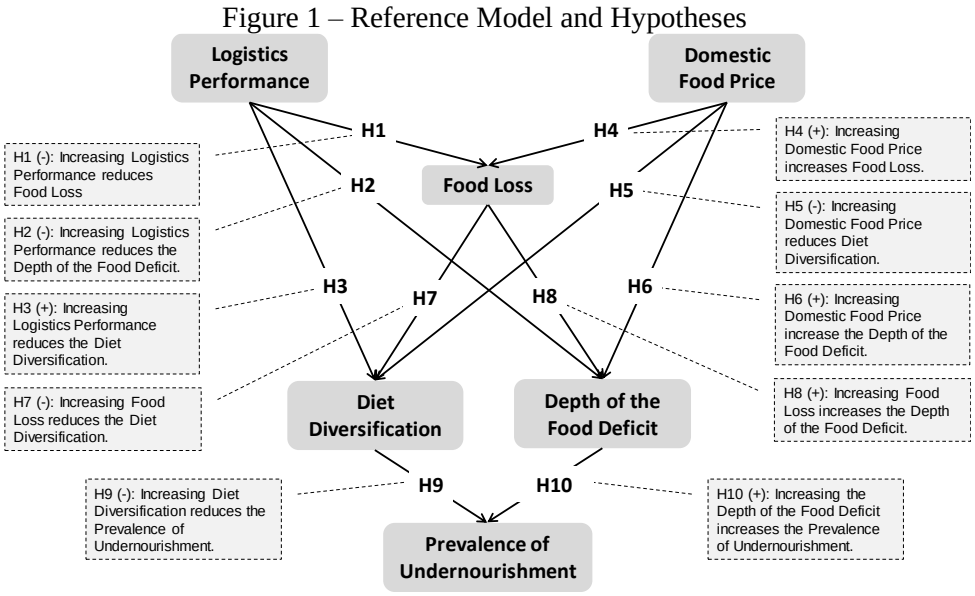
Despite world efforts in the fight against hunger and malnutrition, the number of undernourished people in the world has been rising since 2014, reaching an estimated 821 million (10.9 % of world's population) in 2017 (FAO, 2018). The FLW observed worldwide possibly is aggravated by logistics inefficiency and the high levels of domestic food prices. The logistics infrastructure and performance offers conditions to promote better physical access to food, and accessible domestic food prices promote conditions for economic access to food (Butcher et al., 2018). Earlier studies have clearly shown that adequate access to food, promoted through logistics performance and economic conditions, has strong implications for food security promotion worldwide (Abbade, 2017; Thyberg & Tonjes, 2016).

This study aimed to investigate the impact of logistics performance, domestic food price and food loss on diet diversification and depth of food deficit, as well as the impact of diet diversification and depth of food deficit on prevalence of undernourishment worldwide.

METHOD

This investigation uses an ecological approach, based on available data obtained at FAO, Global Food Security Index and the World Bank. The study was conducted in order to investigate the association between the main variables of the reference model presented in figure 1, considering the 10 hypotheses addressed.

Figure 1 – Reference Model and Hypotheses



The study tested the main hypotheses presented in the reference model (figure 1) through multiple regression analyses.

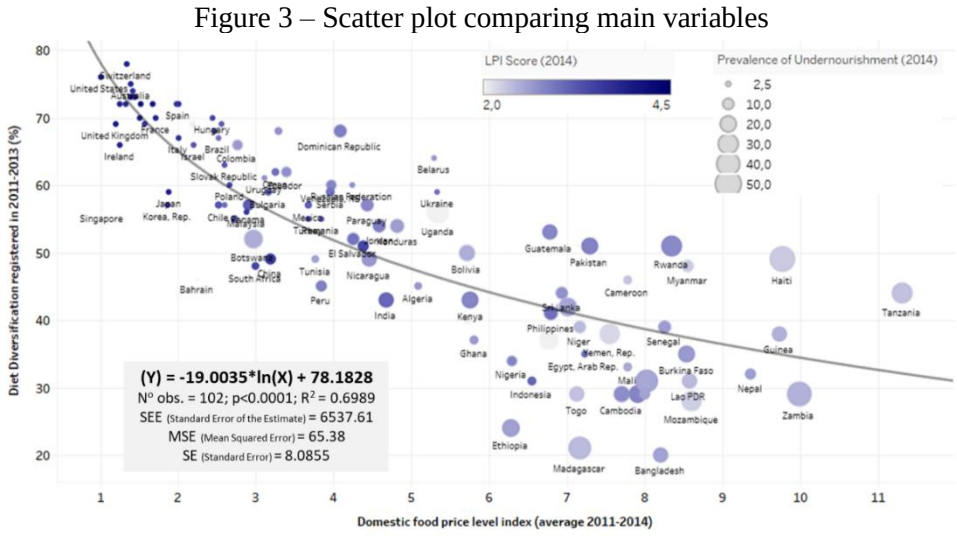
RESULTS

Table 3 shows the main results for the hypotheses. Figure 2 shows a scatter plot considering diet diversification at the Y-axis, and domestic food price index at the X-axis. Also, the visualization allows to observe the LPI score and the prevalence of undernourishment for countries.

Table 3 – Results for hypotheses testing

	Dependent Variables	Independent Variables	β	p-value	Hypothesis testing	R^2
Eq. 1	Food Loss	Intercept	11.3597	0.0084	-	0.3043
		Logistics Performance	-2.4923	0.0252	H1: accepted	
		Domestic Food Price	0.3307	0.1374	H4: rejected	
Eq. 2	Diet Diversific.	Intercept	66.9780	0.0000	-	0.7250
		Logistics Performance	2.2902	0.4119	H3: rejected	
		Domestic Food Price	-4.0915	0.0000	H5: accepted	
		Food Loss	-0.3910	0.1343	H7: rejected	
Eq. 3	Depth of Food Deficit	Intercept	216.8745	0.0936	-	0.4484
		Logistics Performance	-68.0954	0.0688	H2: rejected	
		Domestic Food Price	21.6846	0.0002	H6: accepted	
		Food Loss	-6.7720	0.0127	H8: rejected	
Eq. 4	Prevalence of Undernourish.	Intercept	6.6855	0.0062	-	0.8490
		Diet Diversification	-0.0729	0.1020	H9: rejected	
		Depth of Food Deficit	0.1023	0.0000	H10: accepted	

Figure 3 – Scatter plot comparing main variables



DISCUSSIONS AND CONCLUSION

The FLW observed on a global scale is possibly aggravated by the logistical weaknesses faced by nations, as well as by high levels of food prices in some international markets. Logistics infrastructure offers conditions to promote better physical access to food, while more affordable prices promote conditions to promote better economic access to food (Butcher et al., 2018).

It is also important to consider that commercial food transactions between the nations of the world can increase the degree of food loss, as displacement and long periods of storage and transport, as well as waiting times at customs, can damage food more fragile and with reduced shelf life (Bacenetti et al., 2018), such as fruits and vegetables, making them unsuitable for human consumption. Therefore, promoting the consumption of locally produced food may represent a strategy to reduce food waste, while promoting local economic development. Also, food processing enabling and ensuring nutrient content, safety and shelf life of foods, can be a valid strategy (Augustin et al., 2016).

Evidence shows that food price is the factor that most impacts the prevalence of undernourishment, severely affecting diet diversification and depth of food deficit worldwide. Food price reduction should be a priority for governments worldwide in order to promote food security and extinguish undernourishment.

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