Can international tourism-related activities menace food security in the Least Developed Countries? A preliminary study

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Abstract. The UN World Tourism Organization in 2011 forecasts that international tourist arrivals are projected to reach 1.8 billion by 2030, with an average of 43 million additional tourists joining the tourism market on an annual basis (UNWTO, 2011). In this context, the question that arises is whether the need "to feed the international tourists" can act as a barrier to satisfying food demand in the LDCs, to the extent that the ongoing climate crisis is expected to menace the food security context and, as a result, the highest likelihood of humanitarian crises. The aim of the study is to identify "competition" effects in food demand between the Least Developed Countries (LDCs) and the tourist host countries worldwide, during the 2008-2021 period. The results suggest a positive relationship between food demand in the tourist host countries and the LDCs, which means that the main tourist host economies are both significant importers of food products from the tourist origin economies and significant exporters of food products towards the LDCs. The prospect of an expanding middle class worldwide, especially in the developing countries, could trigger additional pressures on food demand in countries that are both tourist host economies and significant exporters of food products to the LDCs.

Keywords: Food trade, Least Developed Countries, Food security, Tourist flows

1 Introduction

Several studies have outlined both a direct and an indirect impact of various factors on the outbreak of humanitarian crises, such as climate change and the associated lack of resources in the conflict zones (Anderson et al. 2000, Gleditcsh, 2012). Burke et al (2014) highlight the indirect impact of changing climatic conditions on altering the context of social interactions and, as a result, the probabilities of triggering conflicts and humanitarian crises. Extreme weather conditions additionally exert a direct impact on the context of food security, especially in the less developed countries worldwide, putting pressures on local governments to encourage food imports in order to satisfy internal food consumption demand.

On the other hand, especially in the northern hemisphere, some of the national economies possessing comparative advantages in producing and exporting agrifood products are increasingly exposed to intense tourist inflows, in particular during the summer months. Baidoo et al (2022) confirm an over-reliance on imported consumables and merchandises in order to feed international tourists, in the case of 45 sovereign islands during the 1980-2019 period. While admittedly the context of internal demand for food products in the developed tourist host economies seems different than the corresponding in the less developed economies, the steady and increasing demand for agricultural products is rather global. In that case, the main question of this preliminary study is to determine whether there exist "competition" effects when it comes to satisfying food demand between the Least Developed Countries (LDCs) and the host countries of significant tourist inflows.

2 Methodological framework

The log-linear econometric model presented here incorporates some of the common proxies employed in relevant studies, in order to increase the interpretative value of the regressions to be obtained. The dependent variable refers to the tourist host (h) countries' imports ($foodm_d^t$) of food products from tourist origin (o)

countries in year t (UNCTAD, Table 1). Each set of the explanatory variables introduced in the model aims to capture the effect of geographical factors ($dist_{ho}$, $contig_{ho}$, $landlocked_{h,o}$}, output and income effects (y_h, $income_h$), institutional factors (EU_{ho} and WTO_{ho} dummies) and international price-related factors on food import intensity ($foodcpi_t$, $foodprice_t$, $cerealprice_t$ variables).

$$foodm_d^t = e^{\begin{bmatrix} \beta_1\, dist_{ho} + \beta_2\, contig_{ho} + \beta_3\, langoff_{ho} + \beta_4\, langeth_{ho} \\ + \beta_5\, landlocked_h + \beta_6\, landlocked_o + \beta_7\, y_{ht} + \beta_8\, y_{ot} + \\ + \beta_9\, income_{ht} + \beta_{10}\, income_{ot} + \beta_{11}\, foodcpi_t + \\ + \beta_{12}\, foodprice_t + \beta_{13}\, cerealprice_t + \beta_{14}\, x_{ht,ldc} + \beta_{15}\, tot_{ht} \\ + \beta_{16}\, crop_t + \beta_{17}\, EU_{hot} + \beta_{18}\, WTO_{hot} + \beta_{19}\, arrivals_{hot} \end{bmatrix}} \times \varepsilon_{hst} \qquad (1)$$

In order to test the validity of the main question mentioned above, an additional proxy is introduced in the model, representing the number of tourists arrived in tourist host economies from the tourist origin economies on an annual basis ($arrivals_{hot}$). We test here the hypothesis according to which the main tourist host countries are expected to be relatively more dependent on imports of food products, *ceteris paribus*, thus the empirical findings are expected to confirm a positive link. Finally, the last variable introduced comes to identify whether the LDCs are food-import dependent from these tourist host countries. In this preliminary study, the least developed countries' food-import dependency is represented here by the value of tourist host countries' food exports to the LDCs ($x_{ht,ldc}$ variable). The model can be summarized by Equation 1, on the basis of similar econometric analyses, as is for example the case of financial flows (Cieślik and Ghodsi, 2021).

3 Preliminary findings

The sample of tourist host (h) and origin (o) countries are described in Table 1. The GDP output and trade-related data, as is the case for the dependent variable, are provided by the UNCTAD database. The Food and Agricultural Organization statistical database (FAOSTAT) provides annual estimates on the food and cereal price indexes, while data on tourists' arrivals were available by the World Tourism Organization. Finally, data for geographical proxies mainly derive from the CEPII database (Mayer & Zignago, 2011).

Table 1. International tourism intensity effects on food demand in the LDCs.

Variable	Coefficient	Definition & source
$foodm_d^t$		**Tourist host countries' food imports (value) from tourist origin countries - UNCTAD**
$dist_{ho}$	-0.047*** (13.61)	Geographical distance between partners (log) - CEPII
$contig_{ho}$	0.058*** (10.59)	Dummy variable, common border (0/1) – CEPII
$langoff_{ho}$	-0.022** (2.42)	Dummy variable, common official language (0/1) - CEPII
$langeth_{ho}$	0.015* (1.70)	Dummy variable, common ethnic language (0/1) - CEPII
$landlocked_h$	-0.013*** (2.65)	Dummy variable, landlocked tourist-host country (0/1)
$landlocked_o$	-0.010 (1.35)	Dummy variable, landlocked tourist-origin country (0/1)
y_{ht}	0.038*** (14.37)	Tourist-host country's GDP, current USD (log) - UNCTAD
y_{ot}	0.022*** (9.98)	Tourist-origin country's GDP, current USD (log) - UNCTAD
$income_{ht}$	0.006 (1.39)	Tourist-host country's per capita GDP, current USD (log) - UNCTAD
$income_{ot}$	-0.07** (1.94)	Tourist-origin country's per capita GDP, current USD (log) - UNCTAD
$foodcpi_t$	-0.099** (2.27)	Commodity Price Index (all food) - UNCTAD
$x_{ht,ldc}$	**0.014*** (10.29)**	Tourist-host country's exports to the LDCs - UNCTAD
tot_{ht}	0.001 (1.51)	Terms of trade index, tourist-host country - UNCTAD
EU_{hot}	0.047*** (8.67)	Dummy variable, both partners EU members (0/1)
WTO_{hot}	0.076*** (3.64)	Dummy variable, both partners WTO members (0/1)
$foodprice_t$	0.002*** (2.50)	Food price index - FAO
$cerealprice_t$	-0.001* (1.73)	Cereals price index - FAO
$crop_t$	-0.001** (2.25)	Crop Production Index – World Bank
$arrivals_{hot}$	**0.015*** (8.72)**	Number of arrivals (log) from tourist-origin country in tourist-host country - UNWTO
R-squared	**0.729**	
Observations	1438	

Country sample: Australia (o), Austria (h/o), Belarus (o), Belgium (h/o), Bulgaria (h), China (o), Croatia (h/o), Czechia (h/o), Denmark (o), Estonia (o), Finland (h), France (o), Germany (h/o), Greece (h), Hungary (o), Iran (o), Israel (o), Italy (h/o), Kazakhstan (o), Latvia (o), Lithuania (h), Luxembourg (h), Netherlands (h/o), Norway (h), Poland (h/o), Portugal (h), Romania (h/o), Russian Federation (h/o), Slovakia (h/o), Slovenia (h/o), Spain (o), Sweden (o), Switzerland (h/o), Türkiye (h), Ukraine (o), United Kingdom (o), United States of America (o).

The preliminary results confirm the expected positive relationship between food imports and international tourism intensity in the main host countries of tourist flows (Table 1). More specifically, apart from the fact that international tourist flows are indeed beneficial for tourist host economies in stimulating domestic consumption demand, there appears that this positive impact is at least partially offset by the increasing reliance on imports of food products from the tourist origin economies. These preliminary results also suggest that the main tourist host economies are both significant importers of food products from the tourist origin economies and significant exporters of food products towards the LDCs, as can be inferred by the positive coefficient sign of the $x_{d,ldc}$ variable. The gradually expanding middle class in several emerging and developing economies in the world, such is the case of China, may trigger additional international tourist flows over time, an evolution that could possibly put pressures on food demand in the tourist host countries and, at the same time, main exporters of food products to the LDCs. In this context, the question that arises is whether the need "to feed the international tourists" can act as a barrier to satisfying food demand in the LDCs, to the extent that the ongoing climate crisis is expected to menace the food security context and, as a result, the highest likelihood of humanitarian crises.

With regard to the policy implications, it is certain that local governments in the LDCs should take into account the need to ensure the well-functioning of economic institutions, as for example, local market integration with the international food markets could help avoid any future disruptions in the LDCs' internal food demand. Increasing food demand in the main tourist destinations should also be of major concern, as according to relevant studies, about one-third of the human-caused greenhouse gas emissions are related to food consumption (Crippa et al., 2021), thus reminding the vicious cycle between increasing food demand and climate change. The frequency of humanitarian crises outbreaks in the LDCs itself, especially in the African states (e.g. Tigray, Ethiopia), shall be the signal for local governments in order to moderate their dependency on food imports, by implementing policies to integrate innovation and technology into agricultural production processes.

Among the limitations of this preliminary study, and at the same time the next methodological step is to take into account country-time and country-pair fixed effects of our variables of interest on food import intensity (dependent variable), which is the case when studies deal with panel data (Anderson and van Wincoop, 2003; Feenstra, 2004) or aim to capture the effect of time-invariant bilateral trade costs (Yotov et al., 2016). The analysis should be further updated by testing additional variables of interest, in order to obtain robust results on eventual "competition" effects in terms of food demand in the tourist host economies and the least developed countries.

References

Anderson, C.A., Anderson, K.B., Dorr, N., DeNeve, K.M. and Flanagan, M. (2000), "Temperature and aggression", *Advances in Experimental Social Psychology*, Vol. 32, pp. 63-133.

Anderson, J.E. and van Wincoop, E. (2003), "Gravity With Gravitas: a Solution to the Border Puzzle", *American Economic Review*, Vol. 93(1), pp. 170-192.

Baidoo, F., Pan, L., Fiador, V.O.L. and Agbloyor, E.K. (2022), "Importing to Feed International Tourists: Growth Implications for Islands across the Globe", *Munich Personal RePEc Archive*, No. 114131.

Burke, M., Hsiang, S.M. and Miguel, E. (2014), "Climate and Conflict", *NBER Working Paper*, Vol. 20598.

Cieślik, A., Ghodsi, M. (2021), "Economic sentiment indicators and foreign direct investment: Empirical evidence from European Union countries", *International Economics*, Vol. 168, pp. 56-75.

Crippa, M., Solazzo, E., Guizzardi, D., Monforti-Ferrario F., Tubiello, F.N. and Leip, A. (2021). "Food systems are responsible for a third of global anthropogenic GHG emissions", *Nature Food*, Vol. 2, pp. 198-209.

Feenstra, R.C. (2004), *Advanced International Trade: Theory and Evidence*, Princeton University Press.

Gleditsch, N. (2012), "Whither the weather? Climate change and conflict", *Journal of Peace Research*, Vol. 49(1), pp. 3-9.

Mayer, T., and Zignago, S. (2011), "Notes on CEPII's distances measures: the GeoDist Database", *CEPII Working Paper*, Vol. 25.

UNWTO (2011). "*International tourists to hit 1.8 billion by 2030*", article available at: www.unwto.org/ (accessed 24 September 2023).

Yotov, Y.V., Piermartini, R., Monteiro, J.A. and Larch, M. (2016), "*An Advanced Guide to Trade Policy Analysis*", available at: https://www.wto.org/english/res_e/booksp_e/advancedwtounctad2016_e.pdf (accessed 20 September 2023).