Extended Abstract

Paper/Poster Title	The effect of trade digitalization on agrifood trade: A gravity approach

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Abstract	*200 words max*

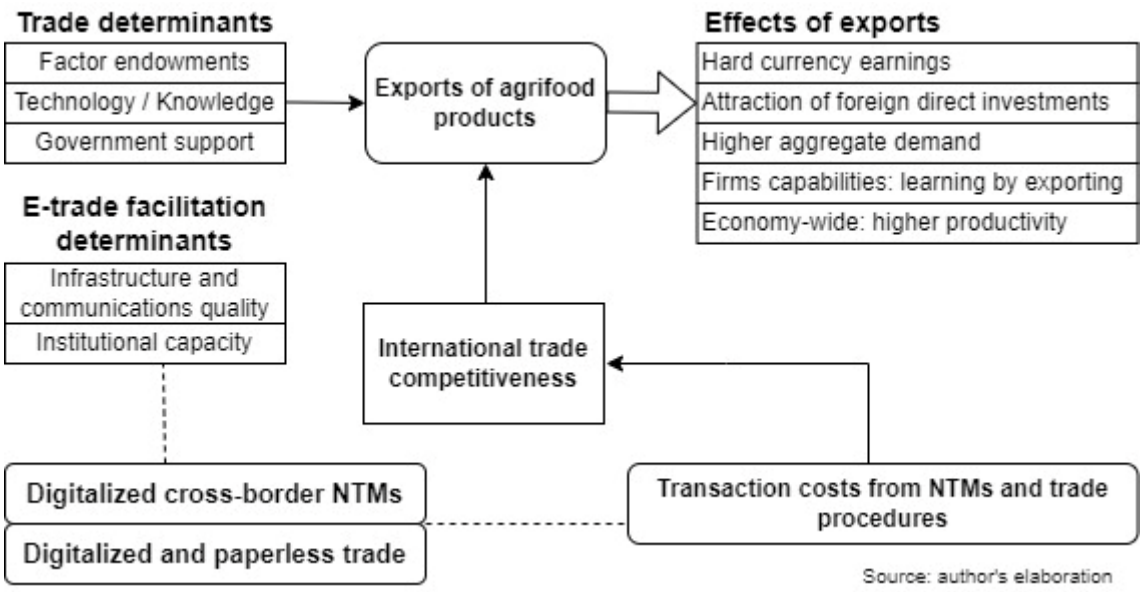
Paperless e-digital trade offers the potential to facilitate the compliance to non-tariff measures and to other trade bureaucracies at lower costs, measures that have been adopted worldwide. We follow a conceptual framework that explains the mechanisms whereby trade digitalization facilitates trade because it streamlines customs operational procedures, thus cutting transaction costs. We measure the impacts of trade digitalization on bilateral agrifood trade using a representative cross-country dataset employed on a gravity model, and extended with country- and time-fixed effects as well as socioeconomic controls. We find evidence that e-trade facilitation at the destination increases agrifood exports by at least 1.4%, while digitalized NTMs at the origin increase the same by 2.4%. Robustness checks sub-divide the sample into the degree of processing and region. Specifically, we find that these effects are larger for processed products and for Sub-Saharan Africa. Furthermore, we ascertain a strong relationship between agrifood exports and e-trade facilitation also at the origin. Therefore, it is inevitable for LMICs to facilitate digital trade to avoid trade diversion. Despite technical challenges, there are ample opportunities for LMICs to benefit from trade digitalization, especially by adapting policy implementation to their local realities in order to take advantage from agrifood export markets.

Keywords	Trade digitalization; Trade barriers; Agrifood trade; Gravity model; Sub-Saharan Africa
JEL Code	F13, F14, Q17

Introduction	*100 – 250 words*

Agrifood trade offers great potential for low and middle-income countries (LMICs) to diversify their export structures into non-traditional export sectors, particularly processed agricultural products. Despite the important role that higher value domestic markets are increasingly playing and that deeper intra-African trade could play, in the medium-term there is more value to be accrued by tapping into international food markets. Hence, international trade is an important pathway for small-scale farmers in LMICs to increase food commercialization, constituting a developmental step for these countries to integrate their agricultural production to trade flows as a pre-condition to increase value addition. Logistic costs related to transportation and customs are the major impediment to increasing international trade and they represent a key factor in the international positioning and competitiveness. We analyze the pathway of e-facilitation of trade via ICTs and digitalization of processes, documents, and non-tariff measures which can reduce transaction costs related to logistics and bureaucracy.

This paper contributes to the literature in four ways: (1) we are the first to combine two rich datasets using a gravity model methodology; (2) we develop a conceptual framework to explain how transaction costs related to trade digitalization are a key impediment to the diversification of SSA agrifood trade; (3) we use these data sets to identify the effects of e-facilitation of trade procedures and bureaucracies on agrifood trade, with particular emphasis on SSA and degree of processing of products; (4) we fill the literature gap on how trade digitalization impacts the agrifood sector, especially in SSA.



Methodology

100 – 250 words

This paper uses the BACI-CEPII dataset, that provides importer and exporter data with products disaggregated at the HS6 digit level. Our main trade policy variables (PT and CB, and also transparency, formalities, and institutional arrangement) are extracted from the UNTFS, which is then merged with the BACI dataset (128 countries), thus yielding a time span of five years (2015-2019). The difference of CB and PT is that the latter refers to general e-facilitation of trade procedures using ICTs not related to NTMs.

Our identification strategy employs the gravity model in order to estimate the impact of our policy variables on bilateral agrifood trade; estimation is done using the Poisson pseudo-maximum-likelihood estimator that better deals with zero-inflated observations. In addition to the baseline gravity model, we include control variables to account for the socio-economic structures of trading countries and a time trend to account for the time dimension. Although we cannot rule out reverse causality between the dependent and the policy variables, we consider that this is a minor issue because bilateral trade flows are less likely to determine the decision to adopt trade digitalization measures, as opposed to unidirectional trade. Lastly, we include the multilateral resistance term to avoid that unobserved country-specific variables correlate

with the error term and, thus, impact agrifood trade. This is accomplished with fixed effects alternating between destination and origin country, which avoids that incorporating all country- and time-pairs fixed effects absorb most of the variation of the policy variables, thus jeopardizing its identification.

Results

100 – 250 words

Descriptive statistics: many countries have not yet adopted CB compared to the other policy variables, despite some progress. Estimation strategy: comparison of different specifications of the gravity model through an analysis of the point estimates and the goodness of fit.

First, we find that PT and CB have positive and significant impacts on bilateral agrifood trade across specifications. The magnitudes of both PT and CB are reduced moving from the least simple to the more complete models, which suggests that the inclusion of gravity and socioeconomic controls absorbs part of the omitted variables. Further controlling for country FEs reduces the correlation between independent variables and the error term, which stems from unobserved covariates that are fixed in time. When comparing results, the magnitudes for PT are greater for CB at the importer level, while at the exporter level the opposite happens. This is in line with our theoretical framework: while imposing NTMs negatively impacts trade, the e-facilitation of NTM documentation stimulates trade.

In sum, the estimation results corroborate our hypotheses that both standardized electronic documentation and processes (PT) and digitalization of NTM processes (CB) are important channels to facilitate trade bureaucracy because they stimulate bilateral trade flows. There is also evidence for the role of formalities and transparency in facilitating trade, though this evidence is less robust compared to PT and CB.

Robustness checks: when limiting the sample to SSA and expanding it with disaggregated products, the results are larger in magnitude for SSA countries and for processed agrifood products.

Discussion and Conclusion

100 – 250 words

Our findings point to a large and significant impact of trade bureaucracy digitalization on agrifood exports, which is stronger in the case of SSA. The results are robust to the inclusion of time- and unobserved country fixed effects. Once we break the sample down by degree of processing of the agrifood products, we observe that the positive effects are also stronger for processed products, which bodes well for an industrial policy focusing on adding value to local raw materials. This could happen because processed products tend to be more complex than unprocessed products in terms of their composition, thus requiring a larger amount of documentation and rules of origin. Furthermore, we observe that digitalization measures that facilitate non-tariff barriers at the destination (importers) play an important role in stimulating agrifood exports, which also bides well for LMICs.

We highlight from our results the following policy implications: (1) PT measures have a higher impact when they are implemented in exporting countries, so this is an important finding for LMICs to facilitate electronic trade bureaucracy; (2) this pattern is stronger in the SSA case, demanding policymakers to continue and deepen their efforts of facilitating trade via digitalization of bureaucratic procedures; (3) simply passing legislation to empower customs authorities and to create legal frameworks is not enough to foster trade, but the actual content of legislation as well as the effectiveness and implementation of trade institutions are crucial; (4) the costs of implementing e-facilitation measures, especially for LMICs, need to be considered.