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The Role of Aid for Trade in Global Value Chains in Emerging Economies

Thesis book of the PhD Dissertation

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1. Introduction

Foreign trade, particularly exports, is pivotal for fostering economic growth. It acts as a catalyst for development, not only by boosting a country's economy but also by enabling global integration and improving international competitiveness. The challenges faced by emerging economies (positioned between developing and developed countries) and developing countries in the realm of international trade are diverse and include issues like trade barriers, inadequate infrastructure, supply-side limitations, external economic shocks, and limited access to resources (Kiute et al., 2015). These difficulties hinder their capacity to participate effectively in global trade and leverage the opportunities presented by e-commerce. To tackle these challenges, the international community has recognised the significance of aid for trade, an initiative designed to help less developed countries overcome domestic hurdles, integrate into the global economy, and attain growth driven by exports.

The Aid for Trade Initiative (AfT), introduced in 2005, marks a significant step in harmonizing trade policies with development assistance (Hallaert, 2013). It acknowledges the obstacles less developed countries face in implementing trade liberalisation and adapting to the ever-evolving global trade system. By offering financial support for factors that can enhance trade performance, such as infrastructure, trade agreements, and trade-related services, AfT serves as a critical instrument for promoting sustainable, efficient, and inclusive economic development. AfT operates within three primary categories: Economic Infrastructure, Building Productive Capacity, and Trade Policies and Regulations (OECD, 2019). These categories encompass various subfields, each serving as a channel for delivering aid.

Over the past few decades, due to the increasing impact of globalisation, certain phases of production that were previously localised in a few locations have now become dispersed across different geographical locations. Global value chains (GVCs) denote a series of activities involved in manufacturing a product or delivering a service, ultimately sold to consumers. Each step contributes value to the final product, with at least two steps being conducted in different countries. When a company engages in at least one step within a GVC, it is considered part of the chain. GVCs have resulted in an increase in the use of intermediate inputs in cross-border transactions, as opposed to final goods, which increase has traditionally been emphasised in international trade frameworks (Antràs, 2020). This has led to the development of a new method for analysing foreign trade based on value-added, which is different from the traditional method of measuring trade value based on its gross value. Researchers have combined data from customs agencies with domestic input-output tables to form worldwide input-output tables to track the movement of value-added trade across nations. The use of value-added data can provide valuable insights into the generation of domestic value-added (DVA) through the export of goods or services, which is essential for development strategies and industrial policies.

The rapid internationalisation of production has allowed more countries, including Emerging Economies (EEs), to participate in GVCs. However, core positions within GVCs remain dominated by major, mainly developed economies. As a result, while developing nations have become increasingly involved in various stages of production, they continue to face challenges in upgrading their roles within these networks. According to Hanson (2012), integrating into GVCs can provide a pathway for EEs to accelerate development, a view further

supported by Gereffi (2014), who emphasises the critical role of GVCs in fostering economic and social progress for these countries. Despite these opportunities, the benefits of GVC participation for EEs are uneven, and their progress is often hindered by structural challenges. As Jangam and Rath (2021) point out, GVC involvement among emerging market economies increased from 34.8% in 1995 to 49.3% in 2011, yet this growing participation does not guarantee equal benefits. There is a significant role of GVC participation in fostering economic development, particularly for EEs. The benefits of GVC integration extend beyond mere trade expansion, encompassing critical aspects like productivity growth (Pahl and Timmer, 2020; Mallick and Zhang, 2022), economic upgrading (Jangam and Rath, 2021; Tian et al., 2022) and diversification of exports (Huong and Park, 2021). These dynamics are instrumental not only in enhancing the global competitiveness of EEs but also in fostering deeper economic upgrading, particularly when local firms are actively integrated into GVCs, enabling stronger linkages and broader developmental gains. However, EEs face significant obstacles such as inadequate infrastructure, limited access to trade finance, and complex compliance and border procedures, all of which increase the costs of engaging in foreign markets. Addressing these barriers requires targeted interventions, with AfT being a potentially crucial mechanism to support EEs in overcoming these challenges and improving their competitiveness in GVCs.

The effectiveness of AfT remains a subject of ongoing debate. Opinions differ on the program's significance in promoting economic growth driven by exports. The role of AfT in international trade and value chains, particularly for EEs continues to evolve and demands further exploration. To gain a deeper understanding of the dynamics and potential benefits of

AfT for EEs, the thesis aims to find the answer to the question of how AfT can contribute to increasing international trade and achieving a better engagement in GVCs in EEs, assuming that GVC participation brings economic benefits to the participating countries. To find an answer to the question a gravity model is employed for estimation, considering trade costs and various other factors. The choice of estimation method, the Poisson Pseudo Maximum Likelihood (PPML), is discussed in detail due to its suitability for addressing challenges related to zero trade observations and heteroskedasticity. Furthermore, difference-in-difference (DiD) model is also applied to check the sensitivity of results.

The novelty of this thesis lies in its multifaceted approach to exploring AfT's impact on EEs. First, it analyses the distribution of AfT and its subcategories across EEs, offering insights into how these funds are allocated. Second, it evaluates the engagement of EEs in GVCs, moving beyond traditional trade data by incorporating value-added trade data, particularly through the application of Trade in Value-Added indicators. Moreover, the thesis introduces a comparative framework that examines the effects of AfT not only as an aggregated entity but also by breaking it down into subcategories. This enables a more nuanced evaluation of how specific types of aid influence export performance and GVC engagement in EEs. A novel angle is added by investigating whether these impacts differ based on whether the trade partner is a donor or non-donor, revealing potential asymmetries in trade relationships. To the best of my knowledge, there has been no prior examination of the distinct impact of AfT allocated to the EEs on their international trade and engagement in GVCs using such a broad scope of methods and data. Moreover, this thesis incorporates a long time series with the latest available data, further enhancing its contribution.

Consequently, the novelty of this thesis lies in filling this gap and making a unique contribution to the existing body of knowledge..

1.1. Hypotheses and research questions

This thesis aims to address both theoretical and empirical gaps in the existing literature on GVCs, aid effectiveness, and international trade. By employing several methods, it seeks to answer the central research question: ***How can AfT enhance international trade and foster deeper engagement in GVCs within EEs, thereby boosting their participation in global trade and improving access to international markets?*** To tackle this question, the thesis assesses the effectiveness of the AfT Initiative in promoting GVC participation through value-added export growth in EEs that have participated in AfT. By concentrating on these specific countries and the available data for the period between 1990 and 2020, the thesis evaluates the importance and potential of AfT to boost their international trade and GVC involvement by testing eight key hypotheses. The exact time frame varies across analyses due to differences in data availability.

H_1: The TiVA and traditional trade data yield significantly different results when applied to the Gravity Model.

H_2: AfT leads to a substantial increase in exports in EEs.

- ***H_{2a}:*** Aid for Economic Infrastructure (AfEI) has a significant positive impact on export performance in EEs.
- ***H_{2b}:*** Aid for Building Productive Capacity (AfBPC) has a significant positive impact on export performance in EEs.

- ***H_{2c}:*** Aid for Trade Policy and Regulations (AfTPR) has a significant positive impact on export performance in EEs.

H_3: The positive impact of AfT is more pronounced in the exports of EEs to donor countries.

H_4: AfT has a positive and significant impact on GVC engagement.

- ***H_{4a}:*** AfT has a positive and significant impact on enhancing the participation of EEs in GVCs.
- ***H_{4b}:*** AfT contributes to improving the positioning of EEs within GVCs.
- ***H_{4c}:*** AfT facilitates the upgrading of EEs within GVCs.

H_5: AfT increases EE reliance on donor value-added, allowing both parties to gain more from the GVCs.

To examine these hypotheses, following research objectives are designed to examine the hypotheses:

1. To analyse the distribution of AfT and its subcategories among EEs.
2. To assess the engagement of EEs in GVCs.
3. To compare traditional trade data with value-added data in the application of gravity models.
4. To evaluate the impact of AfT on the export performance of EEs in the gravity models application.
5. To examine the impact of AfT on GVC engagement in EEs in the gravity models application.

Overall, this framework systematically addresses the research objectives, guiding the analysis of how AfT influences both export performance and GVC participation in emerging economies. Furthermore, applying these objectives also provides

insight into the initiative from the donor's perspective, helping to identify their interests and motivations behind supporting AfT.

1.2. Significance of the thesis

First, by filling in a major knowledge gap about the ways in which AfT might both directly and indirectly affect GVC involvement, this research contributes to the body of literature. Few studies have explored the relationship between AfT and GVCs, despite the fact that many have looked at both independently. This is particularly true in the context of EEs that face particular developmental constraints. The thesis fills this gap by offering a comprehensive examination that is relevant for the formulation of effective trade policies.

Second, policymakers in donor nations, international development organisations, and EEs should take note of the research's practical implications. This thesis provides practical knowledge that can advise on the planning and execution of focused AfT programs by outlining the particular components of AfT that most effectively increase international trade and GVC participation — such as investments in economic infrastructure, productive capacity building, and trade policy reform. For AfT to have the greatest socio-economic impact and to promote reasonable growth in EEs, these insights are essential.

Third, the thesis explores the obstacles involved in implementing AfT and taking part in GVC, offering an in-depth understanding of the challenges that aid-receivers encounter. These challenges include donors' own interests, inappropriate economic policy and poor quality of institutions, deglobalisation, global transmission of macroeconomic shocks, COVID-19 and so on. By drawing attention to these difficulties, the thesis not only helps shape policy in the future but also adds to the continuing

discussion about how to get over these obstacles in order to accomplish sustainable development goals.

Fourth, the thesis applies strong analytical techniques to both traditional and TiVA data, such as difference-in-difference and PPML method in gravity models. These creative approaches support the validity of the thesis's conclusions while also advancing methodology in the field of international trade. Particularly in gravity model applications, comparing traditional data with TiVA data provides fresh insights into quantifying the effect of AfT on export performance and GVC involvement.

While this thesis covers the period up to 2020 due to data availability, its findings remain highly relevant in today's trade landscape. AfT continues to play a crucial role in supporting EEs, particularly as they navigate post-pandemic recovery and heightened geopolitical uncertainties, such as the Russia-Ukraine war and shifting global supply chains, and recent trade policy changes under the Trump administration. The structural challenges that AfT aims to address such as trade facilitation, infrastructure development, and capacity building, persist beyond 2020 and have, in some cases, become even more pressing. Additionally, historical analysis provides valuable insights into long-term trends, allowing policymakers to refine and adapt AfT strategies to current realities. By understanding past patterns of GVC participation and the impact of AfT, this research contributes to shaping more resilient trade policies in an increasingly complex global environment. Thus, this thesis is significant as it closes a crucial gap in the literature and makes contributions to practice, methodology, and policy that can lead to a more efficient use of AfT in advancing global economic integration and development.

1.3. Structure of the thesis

This thesis is structured into seven chapters. It begins with an introduction that outlines the research objectives, significance, and overall structure. Chapter 2 explores the AfT initiative, its statistical overview, theoretical and quantitative underpinnings, and implementation challenges, while Chapter 3 examines the concepts and theories of GVCs together with its statistical review and their consequence and modern challenges. Chapter 4 analyses the nexus between AfT and GVCs, focusing on the impact of AfT investments on GVC engagement in EEs. Chapter 5 details the research methodology, including data sources and analytical methods. Chapter 6 presents the findings and discussions, covering the comparison of TiVA data and traditional data in gravity models application, effects of AfT on export performance and GVC engagement. Finally, Chapter 7 summarizes the key findings, draws conclusions, discusses limitations, and offers recommendations for policymakers and future research.

2. Methodology

The thesis aims to provide comprehensive understanding into the significance of AfT in improving export performance and involvement in the GVC employing a mixture of statistical reviews, cluster analysis, and econometric modelling. The chapter underscores the robustness and reliability of the "Gravity Equation" (Formula 1) in international trade, highlighting its evolution from Tinbergen's (1963) initial model to the contemporary structural gravity model (Formula 2). The empirical literature reveals that while traditional OLS methods have been widely used, they face significant limitations, especially when dealing with zero trade flows and heteroskedasticity. The introduction of the PPML estimation method by Silva and Tenreyro (2006) provides a compelling

alternative, addressing these limitations and offering a more accurate and consistent approach to gravity model estimation.

The research design employed in this thesis integrates both statistical reviews and econometric modelling to explore the role of AfT in GVCs in EEs. By focusing on a group of 24 EEs that consistently receive AfT, this research offers a targeted analysis of AfT's impacts. However, the availability of TiVA data restricts the sample to 21 countries for some analysis, as data for Mauritius, Iran, and Venezuela is unavailable.

The research design involves multiple analyses, starting with a detailed statistical review of AfT distribution and its subcategories among these EEs. Following analyses assess the participation and positioning of these economies within GVCs using comprehensive GVC indicators derived from various data sources, including the OECD QWIDS, OECD TiVA, UNCTAD Eora, and CEPII databases.

Moreover, significant portion of the thesis compares traditional trade data with TiVA data to evaluate their respective applications in gravity models. This broader analysis includes 66 countries, encompassing both OECD and non-OECD nations, to achieve more comprehensive results. The next analysis highlights the nuanced effects of AfT disbursements on the export performance of EEs. By differentiating between donor and non-donor countries, the thesis elucidates the varied influence of AfT subgroups on bilateral trade flows. Finally, the last analysis extends this exploration to the realm of GVCs, assessing how AfT affects different dimensions of GVC engagement, including domestic value-added content in exports and imports. The incorporation of TiVA data enriches the analysis, providing a granular view of value-added trade and its interplay with AfT. The methodological rigor, involving panel data and fixed effects estimations, ensures that the results are both reliable and

reflective of the complex trade environments of EEs. The findings from analyses may underscore the efficacy of the PPML method in addressing heteroskedasticity and zero trade flows, common challenges in bilateral trade data. This methodological choice not only may enhance the robustness of the results but also can offer a more accurate depiction of the trade dynamics influenced by AfT.

$$T_{ij} = G\frac{GDP_i^{\alpha}GDP_j^{\beta}}{D_{ij}^{\theta}} \quad (1)$$

$$X_{ij} = \frac{Y_i E_j}{Y}\left(\frac{\varphi_{ij}}{\Omega_i P_J}\right)^{(1-\sigma)} \quad (2)$$

Statistical analyses are conducted based on below formulas:

$$GVC\_part = \frac{DVX + FVA}{DVA + FVA} \quad (3)$$

$$NVA\_GDP = \frac{DVX - FVA}{GDP} \quad (4)$$

$$GVC\_pos = ln\left(1 + \frac{DVX}{DVA + FVA}\right) - ln\left(1 + \frac{FVA}{DVA + FVA}\right) \quad (5)$$

TiVA data versus Traditional data in gravity models application:

$$lnX_{ij,t} = \pi_{i,t} + \chi_{j,t} + \beta_1 lnDIST_{ij,t} + \beta_2 CNTG_{ij,t} + \beta_3 LANG_{ij,t} + \beta_4 CLNY_{ij,t} + \beta_5 RTA_{ij,t} + \varepsilon_{ij,t} \quad (6)$$

$$X_{ij,t} = exp(\pi_{i,t} + \chi_{j,t} + \beta_1 lnDIST_{ij,t} + \beta_2 CNTG_{ij,t} + \beta_3 LANG_{ij,t} + \beta_4 CLNY_{ij,t} + \beta_5 RTA_{ij,t}) \times \varepsilon_{ij,t} \quad (7)$$

Impact of AfT on exports of Emerging Economies in gravity models application:

$$lnX_{ij,t} = \pi_{i,t} + \chi_{j,t} + \beta_1 lnDIST_{ij,t} + \beta_2 lnAfT_{i,t}^{m} + \beta_3 CNTG_{ij,t} + \beta_4 LANG_{ij,t} + \beta_5 CLNY_{ij,t} + \beta_6 RTA_{ij,t} + \beta_7 CRIS + \varepsilon_{ij,t} \quad (8)$$

$$X_{ij,t} = exp(\pi_{i,t} + \chi_{j,t} + \beta_1 lnDIST_{ij,t} + \beta_2 lnAfT_{i,t}^{m} + \beta_3 CNTG_{ij,t} + \beta_4 LANG_{ij,t} + \beta_5 CLNY_{ij,t} + \beta_6 RTA_{ij,t} + \beta_7 CRIS) \times \varepsilon_{ij,t} \quad (9)$$

Impact of AfT on GVC engagement of Emerging Economies in gravity model applications:

$$lnGVC_{ij,t} = \rho_{i,t} + \delta_{j,t} + \beta_1 lnDIST_{ij,t} + \beta_2 lnAfT_{ij,t}^{k} + \beta_3 CNTG_{ij,t} + \beta_4 LANG_{ij,t} + \beta_5 CLNY_{ij,t} + \beta_6 RTA_{ij,t} + \beta_7 GDP\_cap_{i,t} + \varepsilon_{ij,t} \quad (10)$$

$$GVC_{ij,t} = exp(\rho_{i,t} + \delta_{j,t} + \beta_1 lnDIST_{ij,t} + \beta_2 lnAfT^{k}_{ij,t} + \beta_3 CNTG_{ij,t} + \beta_4 LANG_{ij,t} + \beta_5 CLNY_{ij,t} + \beta_6 RTA_{ij,t} + \beta_7 GDP\_cap_{i,t}) \times \varepsilon_{ij,t} \quad (11)$$

Impact of AfT on GVC engagement of Emerging Economies in DiD model:

$$lnGVC_{ij,t} = \alpha + \zeta\left(Post_t \times Ever\_Treated_{ij}\right) + \gamma\left(lnAfT\_GDP_{ij,t-1}\right) + \beta_1 lnDIST_{ij,t} + \beta_2\left(lnDIST_{ij,t}\right)^2 + \beta_3 CNTG_{ij,t} + \beta_4 LANG_{ij,t} + \beta_5 CLNY_{ij,t} + \beta_6 RTA_{ij,t} + \theta_t + \mu_{ij} + \varepsilon_{ij,t} \quad (12)$$

$$lnGVC_{ij,t} = \sum_{\tau=-5}^{5} \phi_\tau \ (1[\tau = t - 2002] \times Ever\_Treated_{ij}) + \gamma\left(lnAfT\_GDP_{ij,t-1}\right) + \beta_1 lnDIST_{ij,t} + \beta_2\left(lnDIST_{ij,t}\right)^2 + \beta_3 CNTG_{ij,t} + \beta_4 LANG_{ij,t} + \beta_5 CLNY_{ij,t} + \beta_6 RTA_{ij,t} + \theta_t + \mu_{ij} + \varepsilon_{ij,t} \quad (14)$$

3. Findings

The chapter presented a detailed analysis of the thesis's primary findings, structured around the research objectives and questions. The analysis conducted to find the any potential differences between traditional data and the TiVA data in gravity model applications revealed that there is a robust correlation between gross and DVA exports, with negligible differences between these metrics across both OLS and PPML fixed-effects models. This may be attributed to the possibility that countries have similar preferences for trade regarding both gross and value-added measures. Key gravity factors, such as distance, common borders, language, and RTAs, consistently influence trade flows for both HICs and LMICs. Notably, HICs show variations primarily in middle-range export values due to their role as headquarters, while LMICs display greater variability in lower-range exports, reflecting their production-centric role. Re-estimations at different intervals confirm these findings' stability.

The analysis of AfT's impact on EEs' export performance unveils the intricate dynamics between EEs and their donor and non-donor partners. The findings, derived from OLS and PPML fixed-effects estimations, provide valuable insights into how AfT influences export outcomes. Consistently, the results highlight AfT's significant positive impact, particularly through AfEI and AfBPC, on EEs' exports to both donor and non-donor countries. The variability in AfT's influence is evident, with AfTPR showing mixed effects across OLS and PPML models, indicating different sensitivities to trade policy reform. The empirical analysis suggests that EEs gain more from exports to donor countries, affirming their higher trade activity with these nations. This emphasizes the strategic importance of aid in enhancing export performance. Such patterns underscore the effectiveness

of targeted AfT initiatives in fostering trade relationships, aligning with established research.

The analysis of AfT's impact on EEs' engagement in GVCs underscores the strategic role of aid in fostering trade relationships. Using OLS and PPML fixed-effects methods in gravity models estimations, the findings highlight that AfT significantly boosts GVC engagement, with a pronounced effect on DFD_FVA, indicating increased reliance on imported FVA and promoting backward linkages in local industries. As there is no prior literature that specifically examines the impact of AfT on GVC engagement in EEs with recent data and the combined perspectives of donors and recipients, these results present novel insights. While bilateral AfT has a smaller impact, it remains positive, enhancing GVC participation and dependence on donor value-added. Key variables such as contiguity, shared language, higher labour costs, and RTAs positively influence GVC involvement, whereas greater distance negatively affects it. The colonial history variable shows a nuanced impact, being more significant for FVA imports than DVA exports. For EXGR_DVA, AfT strengthens domestic value addition and export capabilities, with shared borders, common language, and RTAs further boosting exports. Furthermore, AfT's impact on IMGR_DVA is positive in PPML and mixed in OLS estimates, suggesting improved domestic supplier capabilities and forward linkages. The more substantial coefficients for total AfT reflect its broader donor diversity and comprehensive aid coverage, emphasizing its effectiveness in enhancing EEs' engagement in GVCs. The use of PPML method, alongside the consideration of both total AfT and bilateral AfT disbursed by each country, also constitutes a significant contribution to the literature.

Finally, the findings from the DiD analysis underscore the pivotal role of AfT in fostering GVC integration among EEs, with

notable enhancements in domestic value-added exports and imports. The DiD and event study results consistently demonstrate that AfT investments yield long-term benefits, enabling economies to strengthen both backward and forward linkages within GVCs. While AfT does not significantly increase reliance on foreign inputs, it effectively bolsters domestic industries, allowing firms to move up the value chain and capture greater economic gains. The lagged effects of AfT/GDP further highlight the necessity of sustained policy commitment, as the full impact materializes gradually over time. By strategically targeting sectors with high linkage potential, AfT can serve as a catalyst for deeper and more resilient GVC participation. These insights provide valuable guidance for policymakers seeking to enhance trade competitiveness and drive structural transformation in emerging economies.

Based on the novel insights highlighted in this thesis, it can be concluded that AfT plays a crucial role in shaping the trade dynamics and GVC engagement of EEs. The thesis introduces a fresh perspective by specifically focusing on EEs, offering a comprehensive analysis of the long-term consequences of AfT through an expanded dataset that covers a broader range of countries and a longer time frame than previous studies. A key finding is the significant difference in the impact of AfT depending on whether the importer is a donor or a non-donor, revealing an asymmetric trade relationship that influences the patterns of trade between aid-receiving EEs and donor nations. Moreover, the thesis uncovers that aggregated AfT flows have a greater impact on trade than bilateral aid contributions, which suggests that broader, multilateral support may be more effective in fostering trade growth.

The novel results also highlight AfT's pivotal role in advancing GVC participation, improving the positioning of EEs,

and facilitating their upgrading—insights that extend beyond the traditional view of AfT simply as a mechanism for trade expansion. Notably, the lack of significance for DFD_FVA supports the argument that AfT tends to prioritize domestic capacity building over increasing import reliance, strengthening local production capabilities rather than deepening foreign input dependence. This thesis, by analysing the impact of AfT on GVC engagement in EEs with recent data and incorporating both donor and recipient perspectives, presents new and valuable contributions to the literature on international trade and development.

4. Summary of the thesis

The thesis aimed to explore how AfT can enhance international trade and foster deeper engagement in GVCs within EEs. To achieve this, the research examined eight key hypotheses. To test the hypotheses, the thesis employed various statistical and empirical methods, including descriptive statistics, pairwise correlation analysis, HCA, and OLS fixed-effects and PPML fixed-effects methods in gravity models. These analyses utilised several panel datasets involving aid-recipient EEs over different periods, depending on data availability. The analyses covered the following:

1. Analysing the distribution of AfT and its subcategories among EEs.
2. Assessing the engagement of EEs in GVCs.
3. Comparing traditional trade data with value-added data in the application of gravity models.
4. Evaluating the impact of AfT on the export performance of EEs.
5. Examining the effect of AfT on GVC engagement in EEs.

The findings reveal that a significant portion of AfT, averaging 38% of total trade assistance, is directed towards EEs. The thesis highlights that the largest share of AfT within EEs is allocated to AfEI, followed by AfBPC, while AfTPR receives a comparatively minor portion. Notably, AfEI disbursements increased significantly following the global financial crisis. Until 2008, AfEI and AfBPC grew at similar rates, while AfTPR declined. During the financial crisis, all categories saw decreased aid, however post-crisis, AfEI showed marked growth, while AfBPC and AfTPR exhibited fluctuations. The peak disbursement occurred in 2017, totalling USD 11 billion, with USD 8 billion allocated to AfEI, highlighting its predominance. In contrast, AfBPC received just over USD 2 billion. These findings demonstrate that the AfT initiative's significance is robust and growing.

The findings indicate that Malaysia leads with a participation index of 0.65, reflecting high integration into GVCs, followed by the Philippines at 0.63. South Africa ranks third with an index of 0.54, showing substantial involvement. In contrast, Argentina, Colombia, Pakistan, Venezuela, and Bangladesh have lower participation levels, with indices ranging from 0.36 to 0.29, and Bangladesh at 0.29 indicates minimal engagement. Concerning net gains from GVC participation, Pakistan has the highest average net value-added index at 5.2, followed by Iran and Venezuela with indices of 5.0 and 4.8, respectively. Nigeria and Peru also rank among the top gainers with indices of 4.4 and 3.8. These countries are generating and retaining significant value within their economies through GVC involvement, particularly in forward segments. Conversely, Vietnam, Malaysia, the Philippines, Thailand, and Mauritius show lower indices, from 0.5 to 0.7, with Mexico at the lowest average net value-added index of 0.4, indicating minimal gains from backward GVC

participation. This suggests that countries with net value-added below 1 are more reliant on imported components, focusing on assembly or production stages with less DVA. Mexico, with a GVC position index of -0.158, is notably involved in downstream activities, likely focusing on assembly using imported components. Mauritius (-0.124) and the Philippines (-0.122) also show strong downstream activity. Conversely, Iran, with an index of 0.243, and Peru (0.218) and Nigeria (0.215) display significant upstream roles, contributing raw materials or intermediate goods. These results demonstrate that EEs exhibit diverse participation levels and distinct roles within GVCs.

H_1: *The TiVA and traditional trade data yield significantly different results when applied to the Gravity Model.*

Next objectives of the research was to compare whether the estimates of the structural gravity model differ using "traditional" foreign trade and TiVA data for a large group of countries. The results show that the differences are small, which can be explained by the fact that countries' inclination for gross and value-added trade can be very similar. This finding is important as it suggests that, despite theoretical differences, traditional trade data can serve as a reasonable proxy for TiVA in gravity models, reinforcing the robustness of AfT impact assessments on trade. In our model estimation, the variables have the expected sign and are significant with the exception of colonial relations. Bilateral trade is negatively affected by distance, while positively affected by a common border, a common language, a common colonial past, and participation in the same regional trade agreement. Another result of the research is the so-called separate examination of the group of manufacturing economies and headquarters economies. In general, the results showed that the share of HICs (headquarter economies) is dominant in global trade, however this has

gradually decreased over time, while the share of LMICs (manufacturing economies) in international trade has steadily increased, with China playing a decisive role. However, the country groups did not produce significantly different results for the models calculated with TiVA and gross exports. The results also showed that LMICs (manufacturing economies) are more sensitive to distance and language factors than HICs, whereas HICs (headquarter economies) benefit more from a common border, a common colonial past and regional trade from participating in an agreement. The results indicate that $\boldsymbol{H_1}$ is rejected, as no significant differences were found between TiVA and traditional data when used in gravity model analyses.

H_2: *AfT leads to a substantial increase in exports in EEs.*

- ***H_{2a}:*** *Aid for Economic Infrastructure (AfEI) has a significant positive impact on export performance in EEs.*
- ***H_{2b}:*** *Aid for Building Productive Capacity (AfBPC) has a significant positive impact on export performance in EEs.*
- ***H_{2c}:*** *Aid for Trade Policy and Regulations (AfTPR) has a significant positive impact on export performance in EEs..*

The following objective was to investigate how AfT disbursements, both in their entirety and when analysed as separate subcategories, impact the export activities of EEs. The research focused on a sample of 24 aid-recipient EEs. It became evident that AfT, in its entirety, as well as its subcategories (AfEI and AfBPC), exert a positive and significant influence on exports from EEs to donor countries. However, differences emerged in the results of OLS and PPML estimations, particularly with respect to AfTPR. In contrast, when exporting to non-donor countries, the results remained consistent, revealing a positive

and significant impact of AfT in general, along with its subcategories. However, AfTPR did not appear to significantly influence exports to non-donor countries. Based on the findings, ***H*$_2$**, ***H*$_{2a}$** and ***H*$_{2b}$** are accepted, as AfT overall, along with its subcategories, AfEI and AfBPC, has a positive and significant impact on the exports of EEs, while ***H*$_{2c}$** is rejected as AfTPR yields mixed results, this may be due to its relatively small share of total AfT, limiting its overall impact on the exports of EEs.

***H*$_3$:** *The positive impact of AfT is more pronounced in the exports of EEs to donor countries.*

The research also emphasised the importance of examining the influence of AfT when considering if the importer is a donor or non-donor. It was evident that AfT and AfEI have a more substantial impact on exports to donor countries than to non-donor countries. In the case of AfBPC, the results diverged between OLS and PPML estimations, suggesting that its impact could vary depending on the importer. The influence of AfTPR was generally insignificant, except for a negative and significant impact on exports to donor countries identified in the PPML model. Based on the results, H_3 is partially accepted, as the positive impact of AfT, particularly the AfEI subgroup, is more pronounced on the exports of EEs to donor countries, whereas the results for AfBPC and AfTPR subgroups vary. This suggests that donor countries may allocate AfT in a way that indirectly benefits their own exports; however, further research is needed to confirm this potential strategic motivation.

***H*$_4$:** *AfT has a positive and significant impact on GVC engagement.*

- ***H*$_{4a}$:** *AfT has a positive and significant impact on enhancing the participation of EEs in GVCs.*
- ***H*$_{4b}$**: *AfT contributes to improving the positioning of EEs within GVCs.*

- ***H_{4c}:*** *AfT facilitates the upgrading of EEs within GVCs.*

The final objective of the thesis was examining the effect of AfT on GVC engagement in EEs. The findings of analysis 3 showed that AfT has a generally positive and significant effect on both domestic value-added embodied in foreign final demand (FFD_DVA) and foreign value-added embodied in domestic final demand (DFD_FVA) for EEs. Both OLS and PPML estimations confirm that total AfT significantly boosts EEs' participation in GVCs. This trend also applies to bilateral AfT from each donor, which, despite its relatively smaller impact, remains positive and significant. Moreover, AfT disbursed to EEs has a positive and statistically significant effect on domestic value-added content of gross exports (EXGR_DVA), indicating that AfT promotes GVC participation by improving infrastructure, building productive capacity, and enhancing trade policies and regulations. This support enables domestic producers to add more value to exports, thereby increasing EXGR_DVA and fostering deeper GVC engagement, leading to higher gains. Additionally, the impact of total AfT on domestic value-added content of gross imports (IMGR_DVA) is controversial, being positive and significant in PPML estimation while negative and significant in OLS estimation. When considering the effects of bilateral AfT, its impact on IMGR_DVA is consistently positive and significant in both OLS and PPML estimations, which reveals several insights. First, the increase in IMGR_DVA suggests that AfT disbursed to EEs helps develop and upgrade domestic suppliers, enabling them to meet international quality standards, thereby attracting foreign producers to source intermediate inputs from the aid-recipient country and increasing the DVA content of imports. Second, rising IMGR_DVA can enhance GVC participation through forward linkages, potentially boosting both upstream and

downstream activities. With AfT, local suppliers in EEs may shift toward higher-DVA activities, potentially moving from assembly to parts production and, in some cases, applied R&D.

Furthermore, the DiD results also confirm that AfT fosters deeper GVC integration by enhancing domestic value-added exports (EXGR_DVA) and imports (IMGR_DVA), reinforcing backward and forward linkages. While AfT does not significantly increase reliance on foreign inputs, it effectively strengthens domestic industries, enabling firms to move up the value chain and capture greater economic gains. The long-term benefits of AfT investments are evident, as they enhance trade capacity, improve supplier capabilities, and facilitate greater participation in GVCs. These findings support the hypothesis that AfT positively impacts GVC engagement (H_4: partially accepted) by enhancing EEs' participation (H_{4a}: accepted) and enabling upgrading within GVCs (H_{4c}: Accepted). However, the extent to which AfT reshapes EEs' positioning in GVCs remains nuanced, as its impact is more evident through domestic value-added improvements rather than external integration (H_{4b}: partially accepted).

H_5: *AfT increases EE reliance on donor value-added, allowing both parties to gain more from the GVCs.*

According to the results of the fourth analysis, AfT does not have significant impact on DFD_FVA, while according to the third analysis, AfT has a stronger impact on DFD_FVA than on FFD_DVA. The findings demonstrate that AfT significantly increases FVA imports from donor countries more than it enhances DVA exports to them, indicating that AfT leads to a greater reliance of EEs on imported FVA. This suggests that AfT promotes backward linkages, gradually positioning local industries downstream in the value chain. Additionally, bilateral AfT also shows positive, though smaller, effects, further boosting

GVC participation and increasing reliance on donor value-added. These findings are novel, as no previous studies have analysed such effects with a focus on EEs, nor have they used recent data to assess both donor and recipient perspectives. Furthermore, the use of PPML method with TiVA data offers more robust results compared to traditional methods. As the findings brought mixed results I partially confirm H_5, affirming that AfT not only enhances GVC participation but also raises EEs' dependence on donor value-added, enabling donors to gain mutually from GVCs through their aid, a conclusion not previously explored in the literature.

5. Policy recommendations

This thesis contributes to our understanding of how international development aid, specifically AfT, impacts the exports of EEs and their engagement in GVCs, suggesting valuable implications for policymakers. The thesis highlights the complexity of aid dynamics and the need to consider various subcategories and perspectives when assessing the effects of AfT. Policymakers can take into consideration a number of recommendations based on the research findings to improve the effectiveness of the AfT initiative and encourage the sustainable development of EEs.

Overall, the findings indicate a positive impact of AfT on both exports and participation in GVCs, suggesting that AfT should remain a crucial component of the SDGs due to its demonstrated effectiveness. Given the sizeable portion of AfT these economies devote to economic infrastructure (AfEI), policymakers might think about keeping or sharpening this emphasis to promote sustainable development. Improved infrastructure eases trade flows, reduces transaction costs, and raises logistical efficiency, relevant to the purpose of integrating

EEs into GVCs. This would facilitate activities both upstream and downstream, which would now have easier access to global markets and suppliers. It is also advised to maximise AfBPC, with an emphasis on figuring out which relevant industries or activities add the most to productive capacity. Increasing AfBPC will enable EEs to progress along the GVCs by transforming their role from that of low-value added performers in early production stages to more sophisticated production stages such as design, branding and technology. Consequently, this increase in DVA share in exports is expected to improve the general competitiveness of these countries.

Moreover, policymakers should promote AfT initiatives that bolster both upstream and downstream functions in EEs. Strengthening both ends of the value chain enables EEs to develop a more complete GVC strategy to realize more value and contribute to sustainable growth. The dual focus reduces reliance on foreign value-added components in responses to increased domestic contributions to upstream and downstream functions. Furthermore, policymakers should reconsider the distribution of AfT, leading to a relatively more balanced distribution of AfT, enabling backward and forward linkages. Characteristically, there is a need to sustain some commitment to backward linkages and initial engagement in GVCs, however the real investment should be committed to forward linkages and higher value-added activities, thereby moving local industries further toward greater economic independence and global economic contribution.

Given that the impact of AfT and its subcategories varies depending on whether the importer is a donor or non-donor country, policymakers should adjust aid programmes to better meet the particular requirements and distinctive features of these groups. Policymakers should work with EEs to diversify both their trade relationships and their sources of aid beyond

traditional donor countries, as a diversified portfolio of donors not only expands export markets and reduces dependence on donor value-added but also contributes more effectively to GVC integration as per the findings of this thesis. Finally, continuous monitoring and evaluation should be conducted to assess the effectiveness of AfT programs to enable the aid to meet the evolving needs of EEs and dynamics of world trade.

6. Thesis limitations and future research directions

In the analysis comparing traditional data with TiVA data in the application of gravity models, a limitation is that, despite examining a relatively large sample, the calculations primarily focus on developed countries due to data availability constraints. Dividing the countries into two groups did not alter the results; however, this may be influenced by the fact that the OECD TiVA database provides better coverage for high-income economies than for low- and middle-income (manufacturing) economies. Furthermore, there might be discrepancies in the quality of the data, with potential issues like inconsistent or incomplete records impacting the reliability of the results. For future research, I suggest exploring the differences in results at the industry level, as sectors vary significantly in their degree of integration into GVCs. Some industries may be more deeply involved in GVCs than others, Thus, conducting analysis at the sectoral level could be a valuable direction for further research, as well as exploring the group of less developed countries, which may yield new insights.

The displayed findings in the analysis of impact of AfT on exports of EEs highlight opportunities for further exploration too. There is a chance that the thesis might have focused on a narrow range of variables, possibly ignoring other relevant variables that could affect the results. Considering a larger range of factors,

such as institutional factors, technology and innovation, corruption and transparency and financial stability, could yield a more comprehensive understanding. Moreover, broadening the range of countries included in the thesis can similarly yield beneficial outcomes. The effectiveness of AfT can be greatly impacted by the qualitative aspects of policy implementation, which may not be sufficiently explored in this thesis. It is essential to comprehend the implementation challenges that exist on the ground. Furthermore, the results revealed significant heterogeneity among EEs, highlighting the importance of detailed country-level studies.

In analysing the impact of AfT on the GVC engagement of EEs, several limitations can be noted. First, the analysis is constrained by the limited time period covered, concluding in 2020, due to the availability of data. However, significant changes have happened since then, including COVID-19 pandemic, the Russia-Ukraine war, an increase in protectionism and a change in the dynamics of global trade. These events might potentially alter trade patterns and GVC structures in ways that are not reflected in the analysis. As a result, the findings may not fully capture long-term trends or the evolving nature of GVCs and AfT. Additionally, the use of aggregate data for AfT and GVC variables could mask significant sectoral or industry-level differences. This aggregation might overlook how specific sectors are uniquely affected by AfT, leading to a potentially oversimplified understanding of the relationship between AfT and GVC integration. Future research should focus on examining the impact of AfT on GVCs at the sectoral level to provide more detailed insights. Moreover, the role of China, particularly its Belt and Road Initiative, could influence these outcomes, as China's involvement in global trade and infrastructure development may shape the results in ways not fully captured in broader analyses.

Furthermore, incorporating qualitative analysis could offer more comprehensive results by addressing the qualitative aspects of AfT and GVC engagement.

Furthermore, future research should address some of the limitations associated with the TiVA data used in this dissertation, particularly its treatment of direct and indirect traded value-added. This is especially relevant for the FFV_DVA and DFD_FVA variables used in testing the final hypothesis. Incorporating indirect export value-added (i.e., value-added that reaches foreign markets through intermediaries) into a gravity model presents methodological challenges, particularly when donor and recipient economies differ significantly in their level of development. A more refined approach that separates direct and indirect value-added trade flows could enhance the accuracy of such analyses. Additionally, the economic and market power of donor countries plays a crucial role in shaping trade and aid relationships, as aid disbursements vary significantly across donors. Future studies could explore these asymmetries in greater detail to provide a more nuanced understanding of how Aid for Trade influences GVC participation.

Overall, the conclusions presented in this chapter highlight the complex relationship that exists between trade assistance programs and the incorporation of EEs into GVCs. Trade aid initiatives have the potential to stimulate EEs' involvement in GVCs and promote inclusive growth on a global level by addressing infrastructure limitations, fostering productive capacities, and improving trade policy and regulatory frameworks. To achieve these goals, nevertheless, will require continued study into the complex dynamics of this connection and how best to maximize trade assistance measures in the context of GVC integration.

7. References

Antràs, P. (2020): Conceptual aspects of global value chains. *The World Bank Economic Review*, 34 (3), 551-574. https://doi.org/10.1093/wber/lhaa006

Gereffi, G. (2014): Global Value Chains in a Post-Washington Consensus World. *Review of International Political Economy*, 21 (1), 9–37. https://doi.org/10.1080/09692290.2012.756414

Hallaert, J. (2013): The future of Aid for Trade: challenges and options. *World Trade Review*, 12 (4), 653-668. https://doi.org/10.1017/S1474745612000730

Hanson, G. H. (2012): The Rise of Middle Kingdoms: Emerging Economies in Global Trade. *Journal of Economic Perspectives*, 26 (2), 41–64. https://doi.org/10.1257/jep.26.2.41

Huong, N.T.T. – Park, D. (2021): Does Global Value Chain Participation Enhance Export Diversification?. *Korea and the World Economy*, 22 (3), 159-191. https://doi.org/10.46665/kwe.2021.12.22.3.159

Jangam, B.P. – Rath B.N. (2021): Does global value chain participation enhance domestic value-added in exports? Evidence from emerging market economies. *International Journal of Finance & Economics*, 26 (2), 1681–16944. https://doi.org/10.1002/ijfe.1871

Kiute, L. S. – Nasiri, A. – Alleyne, A. – Wenxue. J. (2015): Aid for Trade and Export Performance of Developing Countries. *Developing Country Studies*, 5 (14), 5–14.

Mallick, J. – Zhang, A. (2022): Global Value Chains (GVCs) Participation Patterns and Impacts on Productivity Growth in the Asian Economies. *Journal of the Asia Pacific Economy*, 27 (3), 495–514. https://doi.org/10.1080/13547860.2022.2080428

Pahl, S. – Timmer, M. P. (2020): Do Global Value Chains Enhance Economic Upgrading? A Long View. *The Journal of Development Studies*, 56 (9), 1683–1705. https://doi.org/10.1080/00220388.2019.1702159

Silva, J. S. – Tenreyro, S. (2006): The log of gravity. *The Review of Economics and statistics*, 88 (4), 641–658. https://doi.org/10.1162/rest.88.4.641

Tian, K. – Dietzenbacher, E. – Jong-A-Pin, R. (2022): Global value chain participation and its impact on industrial upgrading. *The World Economy*, 45 (5), 1362–1385. https://doi.org/10.1111/twec.13209

Tinbergen, J. (1963): Shaping the world economy. *The International Executive*, 5 (1), 27–30. https://doi.org/10.1002/tie.5060050113

8. List of publications during PhD study period

Journal Publications:

Kheyirkhabarli, M. (2024): Aid for Trade: Boosting exports in emerging economies. *Hungarian Statistical Review*, *7* (1), 89-116. https://doi.org/10.35618/HSR2024.01.en089

Fertő, I. – Kheyirkhabarli, M. – Sass, M. (2024): Gravity models with TiVA data: do they bring new results?. *Applied Economics Letters*, *31* (8), 702-705. https://doi.org/10.1080/13504851.2022.2145010

Fertő, I. – Kheyirkhabarli, M. – Sass, M. (2023): Gravitációs modellek új és hagyományos külkereskedelmi adatokkal. *Statisztikai Szemle*, *101* (6), 522-541. https://doi.org/10.20311/stat2023.06.hu0522

Publications in Conference Proceedings with ISBN/ISSN:

Kheyirkhabarli, M. (2024): *Comparison of the TiVA and traditional data based on income groups in the gravity models application*. In Sávai, M. (ed) 2024: Green and Digital Transitions: Global Insights into Sustainable Solutions. University of Szeged, Doctoral School in Economics, Szeged, 112-123. ISBN: 978-963-306-972-1. https://orcid.org/0000-0002-9969-617X

Kheyirkhabarli, M. (TBP): *Trade Facilitation and Global Value Chains Harmony*. In: Globalisation, integration, cooperation – what is at stake in the current turbulent times?. University of Szeged, Doctoral School in Economics, 22-23 March, 2024 / Szeged, Hungary.

Publications in Conference Book of Abstracts with ISBN:

Kheyirkhabarli, M. (2025): *Aid for Trade and Global Value Chain Integration: Insights from Emerging Economies.* Paper Presented at the 38th RSEP International Meeting on Economics, Finance and Business, January 30-31, 2025 / Dubai, UAE. ISBN: 978-625-97566-2-2/February 2025. Link

Kheyirkhabarli, M. (2024): *The Gravity of Aid for Trade: An Examination of Its Role in Boosting Exports in Emerging Economies*. Paper Presented at the MIRDEC 22nd International Academic Conference on Economics, Business and Contemporary Discussions in Social Science, May 15-16, 2024 / Lisbon, Portugal. ISBN 978-625-94138-2-2. Link

Kheyirkhabarli, M. (2023): *Sectoral Aid Allocation and its Impact on the Exports of Developing Economies: An Empirical Study*. Paper Presented online at the Budapest Business School International Conference on Economic, Diplomatic And Cultural Challenges, June 2, 2023 / Budapest, Hungary. ISBN 9 978-963-625-023-2. Link