

Geographical Proximity and Trade Impacts in the CAREC region

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Trade Facilitation in CAREC: A 10-year CPMM Perspective

Sequence of the presentation

- Introduction
- Data and Methodology
- Description and Empirical Analyses
- Conclusion and policy recommendations

Introduction

- Trade facilitation is a tool that can potentially limit trade barriers and become an effective trade generation player.
- It is estimated that underdeveloped infrastructure accounts for 40% of predicted transport costs for coastal and roughly 60% for landlocked countries (Limao and Venables, 2001).
- Besides fees applied for the transit countries, the additional time spent on border-crossing transactions can be viewed as additional trade costs. For instance, the value of trade drops from 13-35% or 10-51% when one trading partner or both partners are landlocked (Mazhikeyev et al., 2015)
- Djankov et al. (2010) conclude that each additional day delay prior to being shipped reduces trade by 1%. In a similar study, Persson (2008) found that one extra day in time to export (imports) decreased exports by 1% (0.5%).

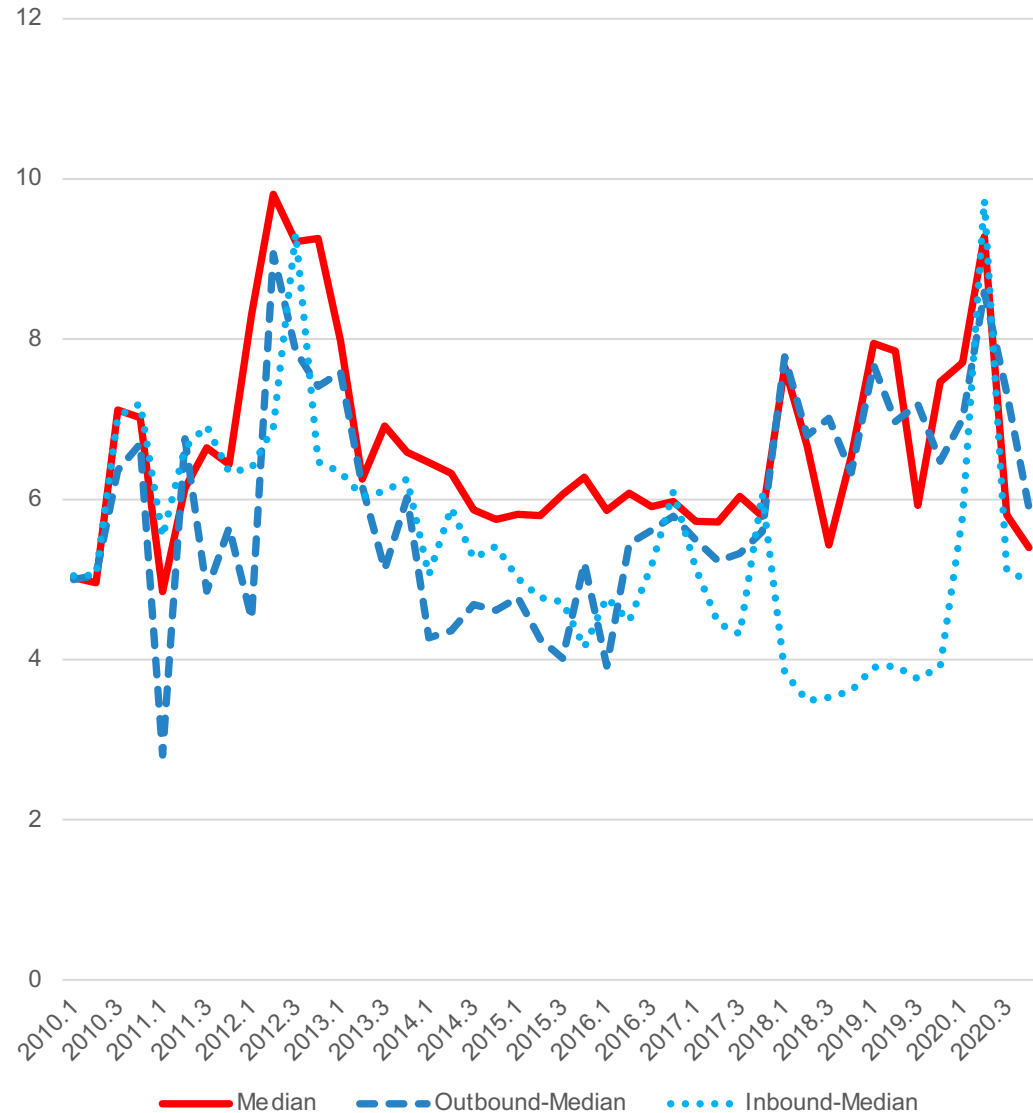
Introduction, continued

- On the other hand, exploiting World Bank's Logistic Performance Index (LPI) Hertel and Mirza (2009) show that trade facilitation reforms in South Asia caused to increase of 5.8 billion US\$ (75%) in intra-regional trade and a 30.8 billion US\$ (22%) increase in trade outside the regions.
- Kim et al (2022) The results imply that reducing time at the importer's border by 10% increases intra-CAREC trade by 1.41%.
- Tobler's (1979) "everything is related to everything else, but adjacent things are more related than distant things." Tobler's theory provides importance to the spatial interactions among regions. Therefore, ignoring spatial dependence in econometrics analysis leads to bias estimation (Anselin 1988).

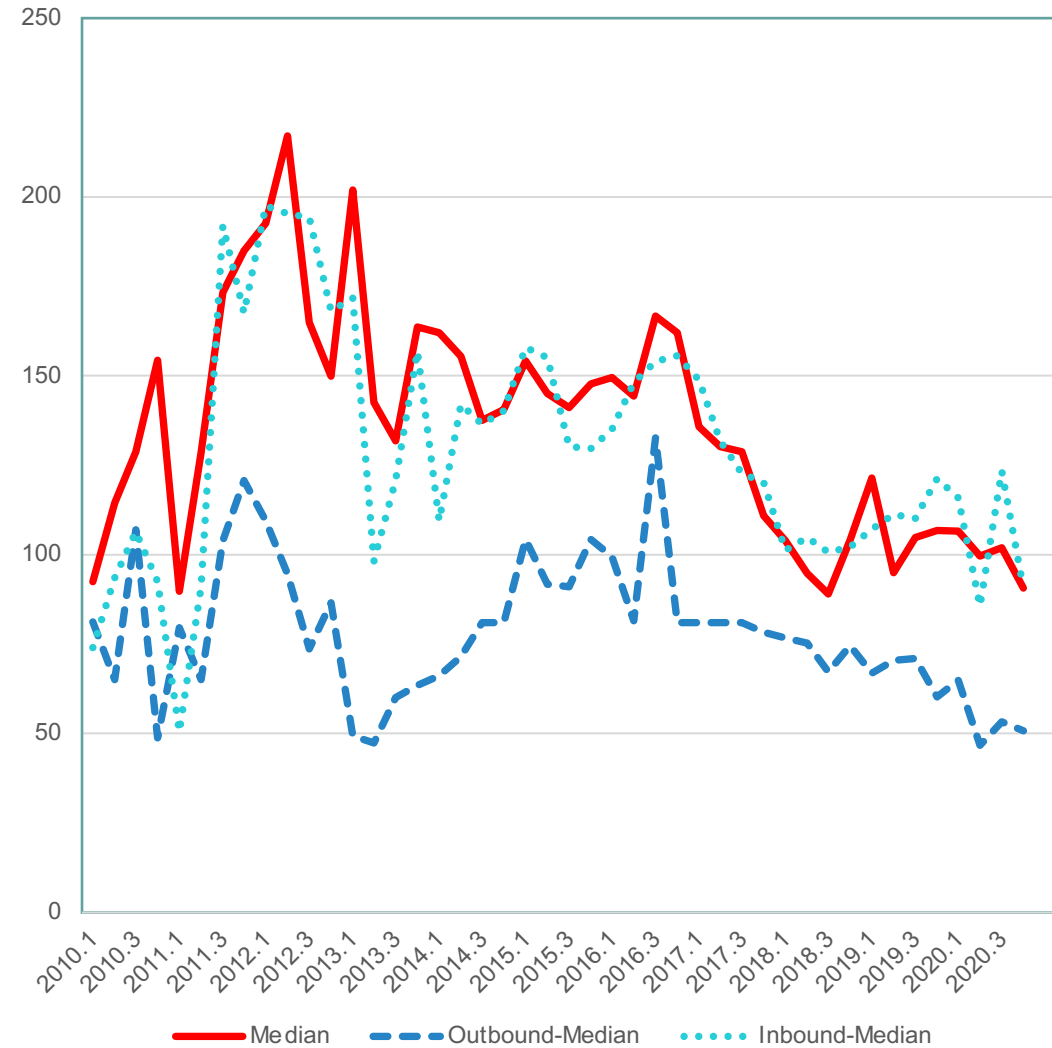
Data: Trade Facilitation Indicators (TFI1, TFI2)

- TFI1** Time taken to clear a border crossing point (hr)
Average length of time (hour) it takes to move cargo (20 tons) across a border from the exit point of one country the entry point of another; to capture both the complexity and the inefficiencies inherent in the border crossing process
- TFI2** Cost incurred at border crossing clearance (US\$)
Average total cost (US\$) of moving cargo (20 tons) across a border from the exit point of one country to the entry point of another; Both official and unofficial payments are included
- TFI3** Cost incurred to travel a corridor section (per 500km, per 20-ton cargo)
Average total costs (US\$) incurred for a unit of cargo (a cargo truck or train with 20 tons of goods) traveling along a corridor section within a country or across borders; Both official and unofficial payments are included
- TFI4** Speed to travel with delay on CAREC Corridors (kph) – SWD (Speed With Delay)
Average speed (kph) at which a unit of cargo travels along a corridor section (a stretch of road 500 km long) within a country or across borders; The total time taken for the entire journey; Distance and time measurements include border crossings; An indicator of the efficiency of BCPs along the corridors
- TFI5** Speed to travel without delay on CAREC Corridors (kph) – SWOD (Speed Without Delay)
Traveling speed only; A measure of the condition of physical infrastructure (such as road and railways)

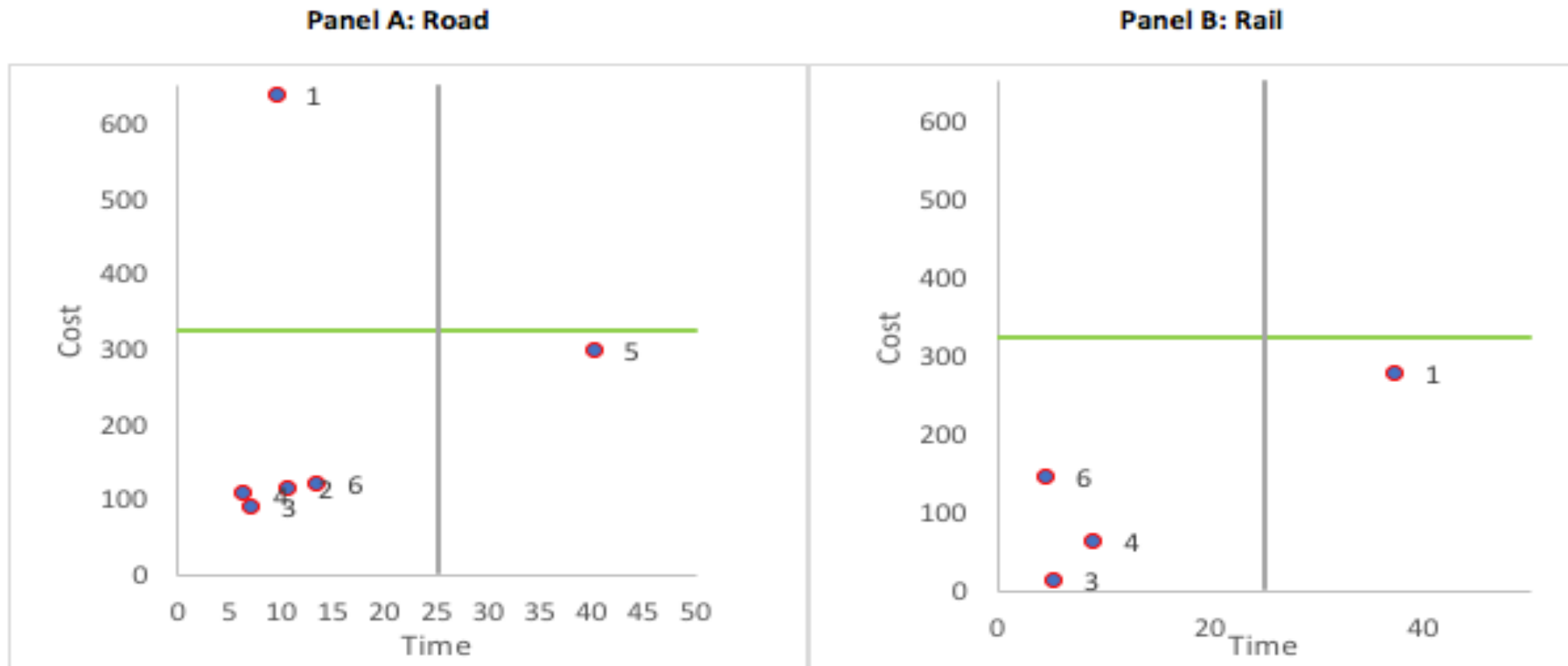
Time taken to clear a BCP (TFI1 in hour) - Road



Costs taken at BCPs (TFI2 in US\$) –Road

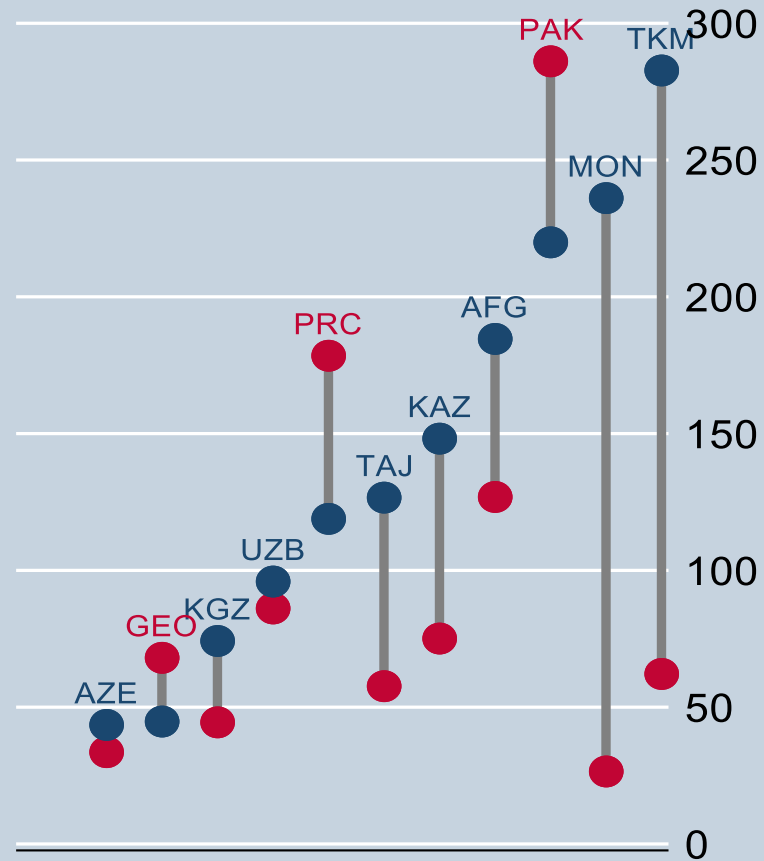


Time and Cost Comparison (2020)

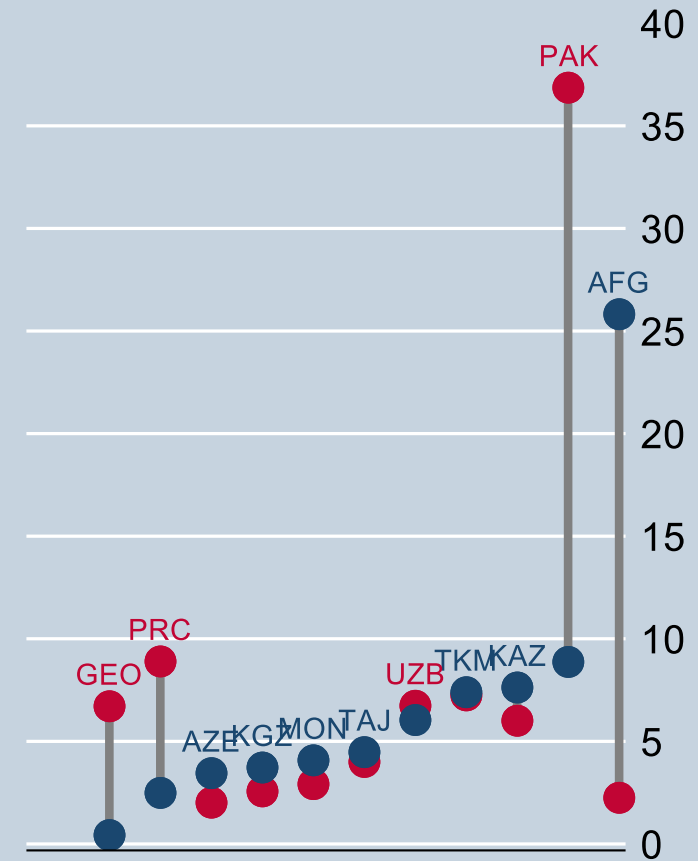


Difference in Inbound and Outbound Cost/Time

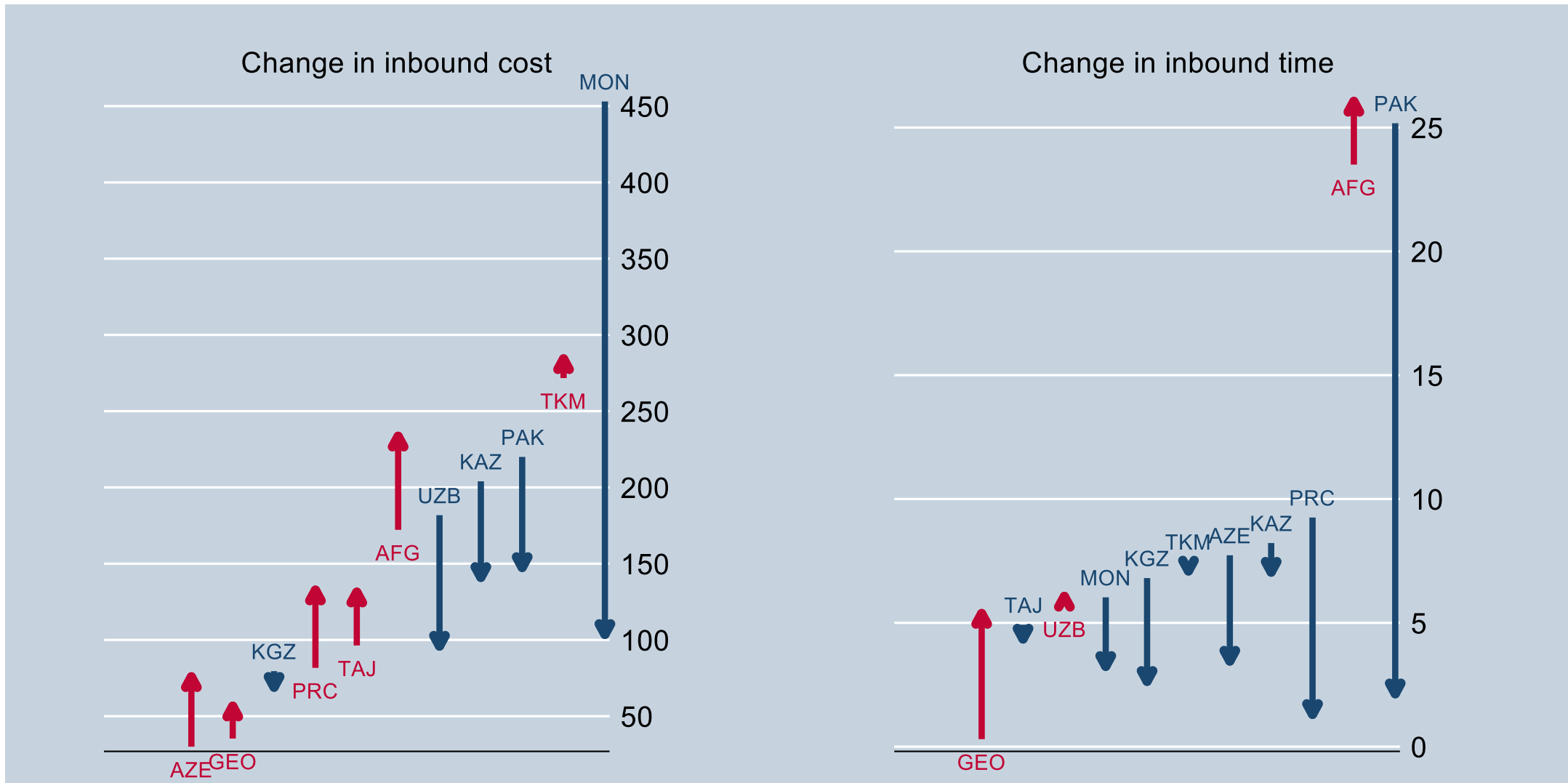
- Inbound cost (median 2010-2019)
- Outbound cost (median 2010-2019)



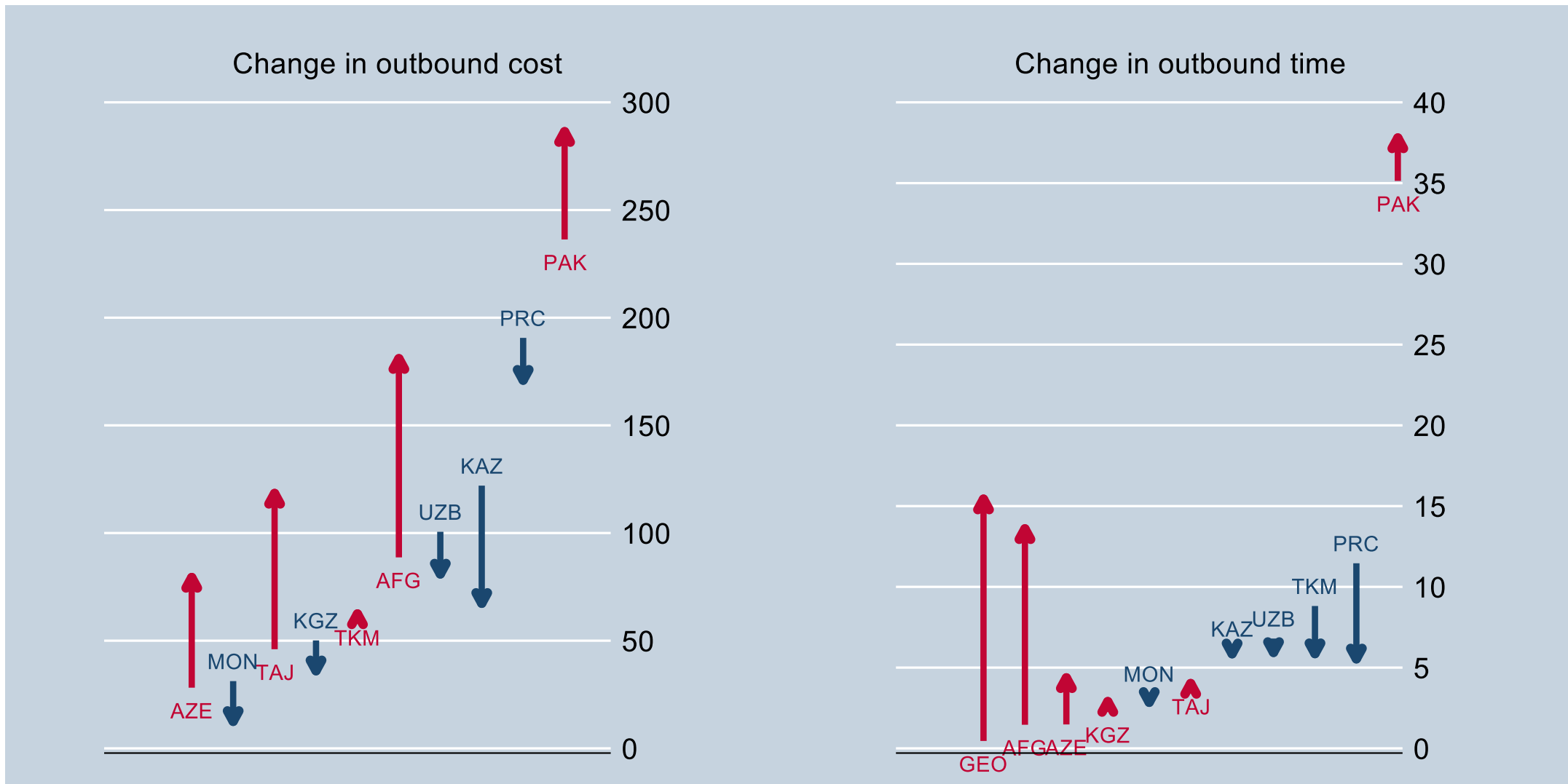
- Inbound time (median 2010-2019)
- Outbound time (median 2010-2019)



Change in Inbound Cost/Time



Change in Outbound Cost/Time



Gravity model

$$\begin{aligned}
 & Trade_{ijt} \\
 & = \exp[\alpha_1 \ln(Distance_{ij}) + \alpha_2 Language_{ij} + \alpha_3 Colony_{ij} + \alpha_4 RTA_{ijt} + \alpha_5 \ln(BorderCost_{ijt}) \\
 & + \alpha_6 \ln(BorderTime_{ijt}) + \alpha_7 \ln(BorderTime_eSPS_{ijt}) + \alpha_8 \ln(CostTime_eSPS_{ijt}) + \beta_{it} + \gamma_{jt}] + \varepsilon_{ijt}
 \end{aligned}$$

where

Trade_{ijt}: Trade of an origin *i* to a destination *j* during year *t*.

Log-transformed values of the annual gross domestic product of exporter and importer are denoted by **GDP_{it}** and **GDP_{jt}** respectively.

Distance_{ij} captures the bilateral geographical distance between country-pairs whereas **Language_{ij}** and **Colony_{ij}** are dummies to record language commonality and colonial relationship, respectively.

RTA_{ijt} denotes the existence of a regional trade agreement between the country-pair.

eSPS represents electronic SPS certification for the country transitioned from hard copy exchanges.

*Export fixed effects and importer fixed effects are captured by **β_i** and **γ_j**.*

*Furthermore, to account for trade evolution over time, we included year dummies, denoted by **δ_t**.*

Comparison of means with and without eSPS procedures

	eSPS (Mean)	Non-eSPS (Mean)	Differences
Inbound Cost	92.60	171.14	-78.54
Inbound Time	6.81	9.17	-2.36
Outbound Cost	82.01	118.07	-36.07
Outbound Time	6.75	9.25	-2.50
<i>N</i>	100		

Gravity Estimates

	(1)	(2)	(3)	(4)
ln(Distance _{ij})	-1.364*** (0.080)	-1.367*** (0.080)	-1.359*** (0.079)	-1.392*** (0.081)
Language _{ij}	0.664*** (0.116)	0.661*** (0.116)	0.685*** (0.120)	0.661*** (0.122)
Colony _{ij}	0.737*** (0.106)	0.738*** (0.105)	0.682*** (0.114)	0.706*** (0.108)
RTA _{ijt}	0.429*** (0.091)	0.430*** (0.090)	0.420*** (0.091)	0.426*** (0.090)
ln(BorderCost _{ijt})	-0.442** (0.179)		-0.495*** (0.179)	
ln(BorderTime _{ijt})		-0.183** (0.091)		-0.239*** (0.090)
ln(BorderCost_eSPS _{ijt})			0.061** (0.026)	
ln(BorderTime_eSPS _{ijt})				0.063*** (0.022)
Constant	31.174*** (1.339)	29.048*** (0.782)	31.124*** (1.326)	29.257*** (0.787)
β_{it}, γ_{jt}	Yes	Yes	Yes	Yes
Observations	11,374	11,572	11,374	11,572

The general specification for Spatial Panel Models:

$$Y_{it} = \delta \sum_{j=1}^N W_{it} Y_{jt} + \beta X_{i,t} + \sum_{i=1}^N \sum_{j=1}^N W_{it} X_{i,j,t} \theta_k + a_i + \delta_t + \epsilon_{it}$$

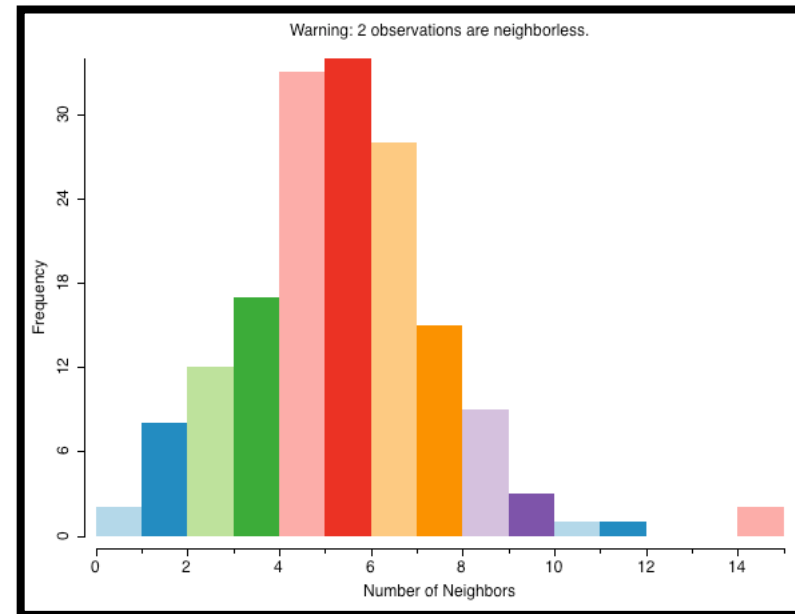
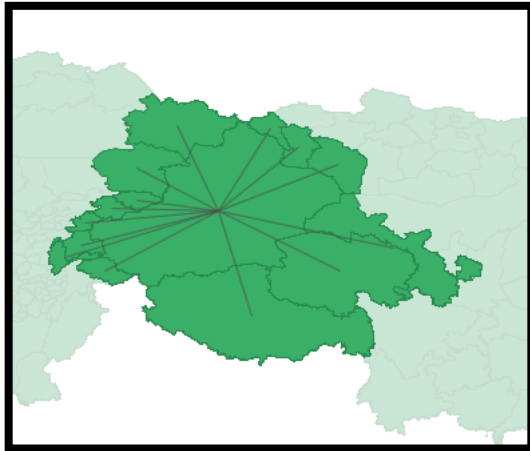
If $\theta = 0$, Spatial autoregressive model with autoregressive disturbances

If $\epsilon_{it} = 0$, Spatial Durbin Model (SDM)

If $\epsilon_{it} = 0$ and $\theta = 0$, Spatial Autoregressive Model (SAR)

If $\delta = 0$ and $\theta = 0$, Spatial Error Model (SEM). When the weight matrix “W” is introduced to the residual.

CAREC regional connectivity



Spatial Results

	Spatial Lag	Spatial Error
TotalI_i	2.46	2.36
TotalC_i	-1.53	4.722
TimeI_i	-1.32	-8.85
TimeO_i	-2.22	-3.71
CostI_i	1.51	-8.50
CostO_i	2.10	-8.500
		Lamda 0.277
N	11	11

Conclusion and Policy Recommendations

- Higher border cost related to border clearance procedure is trade restrictive.
- Similarly, the effect of time required for border clearance procedure is negative and statistically significant. However, the effect is relatively smaller compared to the cost.
- Digitalization of the trade facilitation indicators, for example, e-SPS certification, plays a significant role in the trade facilitation at the BCPs.
- RTAs/FTAs facilitate trade with the partner countries.
- Digitalization initiatives at BCPs can be encouraged.
- A pragmatic approach can be developed for the RTAs/FTAs/PTAs with the partner countries so that trade at BCPs can be facilitated.
- Contiguity (regions) level analyses are missing. These are mainly because of the data limitations. For a country-level holistic and robust analysis, we need to start trade data collection at the regional/BCPs level.

Thank you!

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