Supporting Information for

**Contribution of the transport sector to climate change mitigation:   
Insights from a global passenger transport model coupled with a computable general equilibrium model**

Runsen Zhang1, \*, Shinichiro Fujimori1, Hancheng Dai2, Tatsuya Hanaoka1



**Figure S1. Geographical zoning in AIM/Transport and AIM/CGE**

**Table S1. Regional classification**

|  |  |  |  |
| --- | --- | --- | --- |
| Code | Region | Code | Region |
| JPN | Japan | TUR | Turkey |
| CHN | China | CAN | Canada |
| IND | India | USA | United States |
| XSE | Southeast Asia | BRA | Brazil |
| XSA | Rest of Asia | XLM | Rest of South America |
| XOC | Oceania | XME | Middle East |
| XE25 | EU25 | XNF | North Africa |
| XER | Rest of Europe | XAF | Rest of Africa |
| CIS | Former Soviet Union |  |  |

**Table S2. Endogenous and exogenous variables**

|  |  |  |
| --- | --- | --- |
| Variables | | Description |
| Endogenous variables | *Qr,y* | Total transport demand |
| *Pr,y* | Generalized transport cost |
| *QDISr,y,d* | Distance-wisetransport demand |
| *PDISr,y,d* | Distance-wise price |
| *SDISr,y,d* | Share of each distance *d* |
| *QMODEr,y,d,m* | Mode-wisetransport demand |
| *PMODEr,y,d,m* | Mode-wise price |
| *SMODEr,y,d,m* | Share of each mode *m* |
| *QSIZEr,y,d,m,s* | Size-wisetransport demand |
| *PSIZEr,y,d,m,s* | Size-wise price |
| *SSIZEr,y,d,m,s* | Share of each size *s* |
| *QTECr,y,d,m,s,t* | Technology-wisetransport demand |
| *PTECr,y,d,m,s,t* | Technology-wise price |
| *STECr,y,d,m,s,t* | Share of each Technology *t* |
| *QTECNEWr,y,d,m,s,t* | Demand based on new technology |
| *QTECNEWTr,y,d,m,s* | Total new technology investment |
| *OPRr,y,d,m,s* | Operation rate |
| *ENEr,y,d,m,s,t,f* | Energy consumption |
| Exogenous variables | gdpr*,y* | Gross domestic product |
| *popr,y* | Population |
| *ptimer,y,d,m* | Price of travel time |
| *awhr,y* | Annual working time |
| *ddtsr,y,d,m* | Door-to-door speed |
| *pfuelr,y,d,m,s,t,f* | Price of fuel |
| *pghgr,y,d,m,s,t,f* | Carbon price |
| *pdevicer,y,d,m,s,t* | Price of device |
| *τ* | Depletion rate |
| *eir,y,d,m,s,t,f* | Energy intensity |
| *qtecprer,y,d,m,s,t* | Technology-wisetransport demand in previous year |
| *eiprer,y,d,m,s,t,f* | Energy intensity in previous year |

**Table S3. Regional-wise Mean Absolute Percentage Error (MAPE) (%) of the business as usual (BaU) scenario**

|  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| Region | Iteration | | | | | | | | | | | | | |
| 0 | 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 | 9 | 10 | 11 | 12 | 13 |
| XAF | 785.53 | 53.90 | 4.57 | 1.88 | 0.60 | 1.41 | 0.57 | 0.84 | 0.77 | 0.65 | 0.75 | 0.59 | 0.67 | 0.56 |
| XNF | 141.01 | 11.58 | 2.37 | 0.87 | 1.03 | 0.19 | 0.47 | 0.22 | 0.35 | 0.27 | 0.30 | 0.28 | 0.27 | 0.27 |
| XOC | 218.00 | 15.89 | 20.53 | 3.36 | 1.43 | 0.92 | 1.15 | 0.73 | 0.90 | 0.58 | 0.79 | 0.59 | 0.73 | 0.61 |
| CAN | 9898.92 | 48.58 | 11.04 | 1.03 | 1.66 | 1.05 | 1.08 | 1.02 | 1.05 | 0.88 | 1.03 | 0.88 | 0.99 | 0.89 |
| CHN | 414.02 | 20.45 | 1.55 | 0.23 | 0.35 | 0.19 | 0.33 | 0.21 | 0.33 | 0.24 | 0.30 | 0.24 | 0.26 | 0.23 |
| XER | 389.37 | 69.34 | 53.14 | 14.24 | 13.18 | 2.50 | 3.27 | 1.67 | 2.39 | 1.79 | 2.29 | 1.85 | 2.08 | 1.83 |
| TUR | 853.13 | 40.96 | 6.70 | 5.28 | 1.37 | 1.91 | 0.89 | 1.14 | 1.03 | 0.98 | 1.00 | 0.92 | 0.93 | 0.88 |
| CIS | 133.44 | 13.27 | 1.60 | 0.28 | 0.65 | 0.26 | 0.41 | 0.24 | 0.25 | 0.26 | 0.24 | 0.29 | 0.24 | 0.27 |
| IND | 783.20 | 42.37 | 134.29 | 89.42 | 95.83 | 77.13 | 76.46 | 63.35 | 60.18 | 49.88 | 45.43 | 36.33 | 31.56 | 22.78 |
| JPN | 309.51 | 47.51 | 80.08 | 33.11 | 34.68 | 13.67 | 11.61 | 2.28 | 3.57 | 1.80 | 2.51 | 1.93 | 2.30 | 1.99 |
| BRA | 980.98 | 29.17 | 8.96 | 0.71 | 0.61 | 0.53 | 0.59 | 0.50 | 0.57 | 0.50 | 0.54 | 0.49 | 0.51 | 0.48 |
| XLM | 560.92 | 36.39 | 1.50 | 0.81 | 1.66 | 0.94 | 1.19 | 0.71 | 0.81 | 0.56 | 0.55 | 0.48 | 0.50 | 0.48 |
| XME | 221.86 | 6.09 | 1.77 | 0.79 | 1.73 | 0.56 | 1.01 | 0.32 | 0.55 | 0.28 | 0.31 | 0.34 | 0.29 | 0.34 |
| XSE | 660.47 | 46.81 | 3.33 | 0.30 | 0.45 | 0.21 | 0.39 | 0.18 | 0.39 | 0.25 | 0.37 | 0.25 | 0.29 | 0.21 |
| XSA | 335.92 | 13.75 | 1.79 | 0.56 | 0.36 | 0.23 | 0.49 | 0.25 | 0.48 | 0.26 | 0.38 | 0.26 | 0.31 | 0.25 |
| USA | 4439.70 | 15.50 | 8.09 | 0.91 | 0.83 | 0.90 | 0.91 | 0.82 | 0.93 | 0.78 | 0.90 | 0.78 | 0.85 | 0.78 |
| XE25 | 308.15 | 108.99 | 43.13 | 67.78 | 49.45 | 44.92 | 28.75 | 24.15 | 10.48 | 8.42 | 3.61 | 2.58 | 2.00 | 1.87 |