

**Worldwide e-commerce development :  
after the Covid-19 and the current economic crisis,  
could we expect a catch-up and  
convergence process between  
countries ?**

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# Agenda

1. E-commerce development around the world
2. Literature
3. Econometric regressions
4. Conclusion

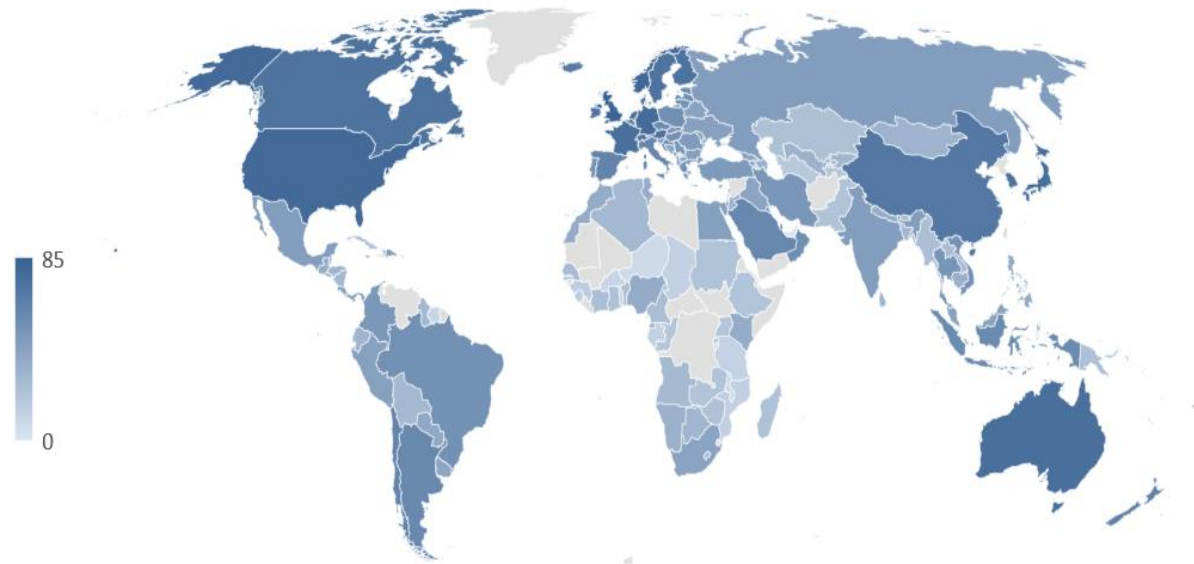
# E-commerce development around the world

The Covid-19 pandemic accelerated even further the adoption of e-commerce by both consumers and businesses.

*Alcedo et al. 2022 :*

- Economies that implemented stricter measures during the pandemic, exhibited much higher online spending during the pandemic ;
- Economies with higher pre-pandemic e-commerce penetration rates experienced a stronger increase in the share of e-commerce in total consumption, exacerbating the digital divide across economies during the pandemic ;
- The increase in e-commerce penetration rates were mostly transitory at the aggregate level. At the country level, significant differences appears with higher penetration rates in emerging economies.

# Penetration rates of e-commerce in 2021 (% points)



Source : Statista

Strong heterogeneity in e-commerce penetration rates across countries.

- *Is a convergence of e-commerce penetration rate level between countries likely to happen around the world or at least at a regional level ?*
- *Studying the determinants of e-commerce could allow us to explore that question.*

# Literature review (1/5) – Factors regarding infrastructure and regulation

Positive impact on e-commerce

## ICT infrastructures

## Delivery facilities

Ricker and Kalakota (1999), Jain et al. (2017)

## Secure payment system

(Ho et al. 2007; Jing, 2009; Fatonah et al., 2018, Hassan et al., 2020)

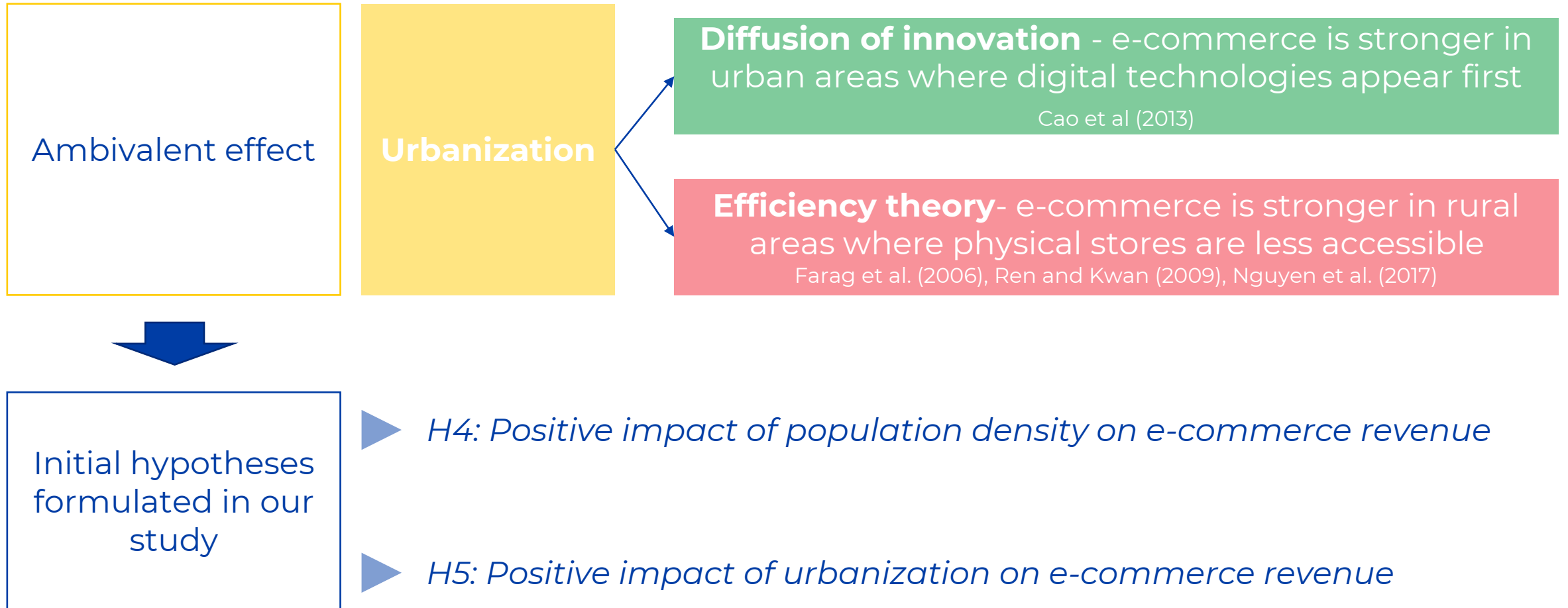
## Regulatory and legislative policies

Khan and Krishnan (2019), Gori and Silvestri (2018)

Initial hypotheses formulated in our study

- ▶ *H1: Positive impact of mobile coverage (3G or 4G) on e-commerce revenue*
- ▶ *H2: Positive impact of the number of Internet servers on e-commerce revenue*
- ▶ *H3: Positive impact of the UPU's Integrated Index for Postal Development or its components on e-commerce revenue*

# Literature review (2/5) - Factors regarding geography and demography



# Literature review (3/5) - Factors regarding wealth

Positive impact on e-commerce

**GDP or GDP per capita**

Clarke et al. (2015), Nikali and al. (2016)

Negative impact on e-commerce

**Subscription fees to Internet services**

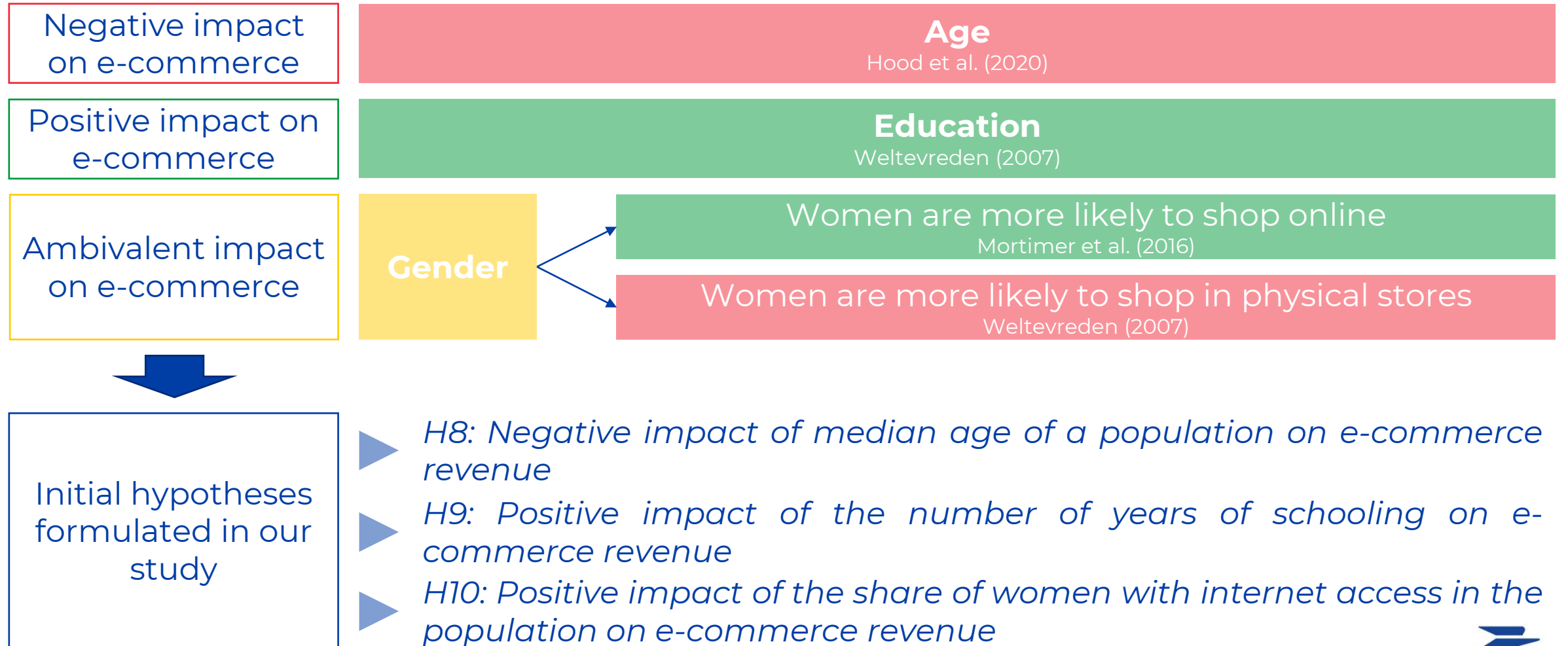


Initial hypotheses formulated in our study

▶ *H6: Positive impact of GDP per capita on e-commerce revenue*

▶ *H7: Negative impact of fixed broadband and mobile broadband prices on e-commerce revenue*

# Literature review (4/5) – Factors regarding socio – demographic characteristics





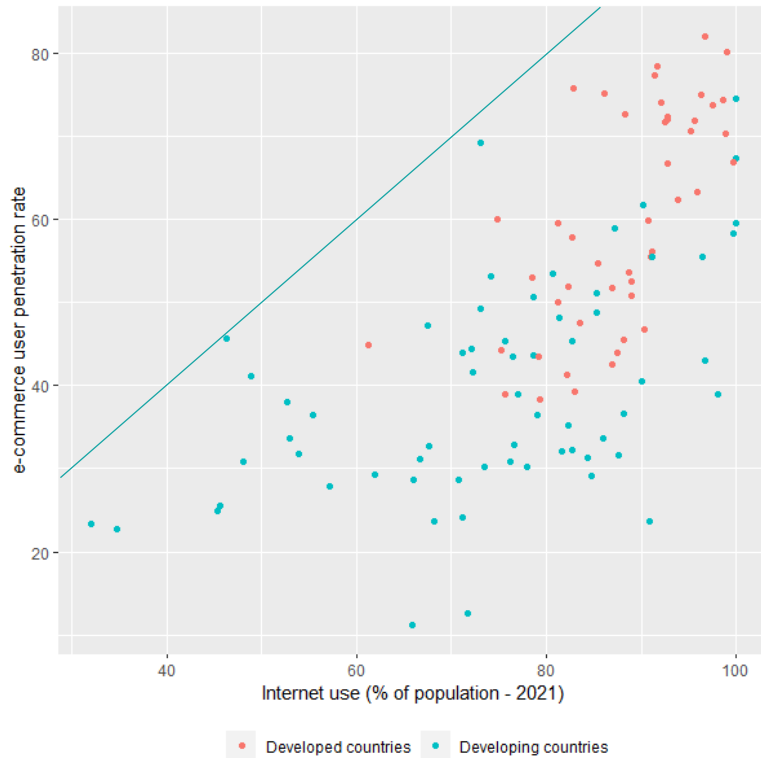
# Literature review (5/5) – Factors regarding cultural dimensions

## Hofstede's cultural dimensions



# Dataset

Data from international organizations (UN, Unesco, World Bank, OECD, ITU, UPU) and Statista on 104 countries from 2017 to 2021



Source : Statista, ITU

- Differences in Internet use do not explain by themselves the whole differences in adoption of e-commerce.
- Countries wholly covered with 4G Internet technology or in which almost all the population uses Internet, exhibit different e-commerce penetration rates.

# Panel models – *Identifying the drivers of e-commerce*

## General form of the estimated model on panel data

$$\ln(\text{ecommerce revenue per capita})_{it} = \alpha + \sum_k \theta_K X_{kit} + \mu_i + \lambda_t + \varepsilon_{it}$$

$i : 1, \dots, n$  : the country index

$t = 1, \dots, T$  : the time index

$\alpha$  : constant term

$X_k$  : the explanatory variables

$\mu_i$  : individual (country) fixed

$\lambda_t$  : time fixed effects

$\varepsilon_{it}$  : the random disturbance term of mean 0

Dummies for the pre-Covid years to capture time effects and a specific Covid dummy for the period 2020-2021 to catch the impact of the pandemic.

# Estimation results - Global model

	Coefficient	Significance
GDP per capita (logarithm, USD current)	0.2856	***
Dummy for 2018	0.0825	***
Dummy for 2019	0.1877	***
Covid (dummy for 2020 and 2021)	0.8102	***
Interaction between GDP per capita and the Covid dummy	-0.0299	.
4G Coverage of the population	0.0013	.
UPU index for postal reliability	0.0009	.
Share of women with access to Internet in the population	0.0206	***
Share of population in rural area	-0.0520	***
Adjusted R <sup>2</sup>	0.86991	
F-Statistic	273.68 (p-value <2,22 <sup>e-16</sup> )	

Positive impact of GDP per capita (H6)

Two-fold impact of the Covid-19 pandemic

Positive impact of postal infrastructure (H3)

Domination of the theory of innovation (H4)

Estimations on developed and developing countries subsets yield significantly different results.

Note: '\*\*\*' = p-value between [0, 0.001]; '\*\*' = p-value between [0.001, 0.01] '\*' = p-value between [0.01, 0.05]; '.' = p-value between [0.05, 0.1];

# Estimation results - Model specific to developing countries

	Coefficient	Significance
GDP per capita (logarithm, USD current)	0.2749	*
Dummy for 2018	0.0869	*
Dummy for 2019	0.1883	***
Covid (dummy for 2020 and 2021)	0.5039	***
3G Coverage of the population	0.0098	*
Share of women with access to Internet in the population	0.0190	***
Median age	0.1183	**
UPU Index for reliability	0.0015	.
Adjusted R <sup>2</sup>	0.86489	
F-Statistic	135.58 (p-value <2,22 <sup>e-16</sup> )	

Positive impact of **3G** coverage of the population (H1)

Positive impact of median age (H8)

Common variables with the global model : GDP per capita, time dummies, share of « connected women », UPU Index

Note: '\*\*\*' = p-value between [0, 0.001]; '\*\*' = p-value between [0.001, 0.01] '\*' = p-value between [0.01, 0.05]; '.' = p-value between [0.05, 0.1];

# Estimation results - Model specific to developed countries

	Coefficient	Significance
GDP per capita (logarithm, USD current)	0.6876	***
Dummy for 2019	0.0830	***
Covid (dummy for 2020 and 2021)	0.3907	***
4G Coverage of the population	0.0017	*
Share of women with access to Internet in the population	0.0220	***
Mean years of schooling	0.2199	**
Integrated Index for Postal Development	0.0025	.
Adjusted R <sup>2</sup>	0.89652	
F-Statistic	254.527 (p-value <2,22e-16)	

Strongest coefficient associated with GDP (among different models)

Positive impact of the share of women with access to Internet in the population (H10)

Positive impact of the mean years of schooling (H9)

Common variables with the global model : GDP per capita, time dummies, 4G coverage, share of « connected women »

Note: '\*\*\*' = p-value between [0, 0.001]; '\*\*' = p-value between [0.001, 0.01] '\*' = p-value between [0.01, 0.05]; '.' = p-value between [0.05, 0.1];

# Cross sectional models – measuring the impact of culture in e-commerce use

## General form of the estimated model for 2021 for developed countries

$$\ln(\text{ecommerce revenue per capita})_i = \alpha + \sum_k \beta_K X_{ki} + \sum_k \theta_K D_{ki} + \varepsilon_i$$

Where  $X_k$  are previously used explanatory variables and  $D_k$  are cultural dimensions

	Coefficient	Significance
Intercept	-11.2559	**
GDP per capita (logarithm, ppp, USD 2017)	1.1011	***
Indulgence vs. restraint	0.0099	*
Individualism vs. collectivism	0.0086	*
Masculinity vs. femininity	-0.0070	**
4G Coverage of the population	0.0490	*
Integrated Index for Postal Development	0.0098	**
Adjusted R <sup>2</sup>	0.8549	
F-Statistic	34.38 (p-value: 1.148e-11)	

3 of Hofstede's cultural dimensions are significant

Societies who encourage satisfaction of needs are linked with higher e-commerce revenue

Individualistic societies are linked with higher e-commerce revenue

Masculine societies are linked with lower e-commerce revenue

# Conclusion

- **Significant increase in e-commerce during the Covid-19 but transitory effect**
- **5 main categories of factors influencing e-commerce adoption**
- **Positive impact of the Covid-19 pandemic on e-commerce development**
- **Some drivers common to all categories of countries :**
  - GDP per capita
  - The telecommunication coverage (either in 3G or 4G)
  - The quality of postal infrastructure
  - The share of women having access to Internet
- **Cultural factors have a significant effect on e-commerce adoption**
- **No convergence yet but not enough data on post-Covid-19 years to assess whether the pandemic has mitigated the weight of cultural differences.**





***THANK YOU  
FOR YOUR ATTENTION!***