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"DOES CROSS-BORDER COMMUTING BETWEEN NEIGHBOURING EU-COUNTRIES REDUCE INEQUALITY?"

Presentation prepared for the AMEF 2022 Conference

Department of Economics, University of Macedonia, Monday, April 18th, 2022.

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Motivation for studying cross-border commuting

1. Cross-border issues (economy, safety, labour market, migration, governance, InterReg, Brexit) are a big theme in Europe.
2. Cross-border commuting can stimulate cross-border regional economic development (better matching, increases economies of scale, agglomeration effects) and solve discrepancies on cross-border labour markets also to reduce regional inequalities.
3. Now lack of insight in actual flows but also lack of insight in drivers and impact of cross-border commuting and policy.
4. This paper: explanatory analysis of commuter flows between neighbouring EU countries in relation with economic (wage & unemployment), (road) accessibility and language similarities. Analysis for all commuters and for various groups distinguished by gender, education and age + analysis by economic sector.

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European Commission

BORDER REGIONS
MEASURES TO BOOST GROWTH AND JOBS

The Single Market and freedom of movement are EU rights. Citizens enjoy being able to move, work, study or use services in other EU countries.
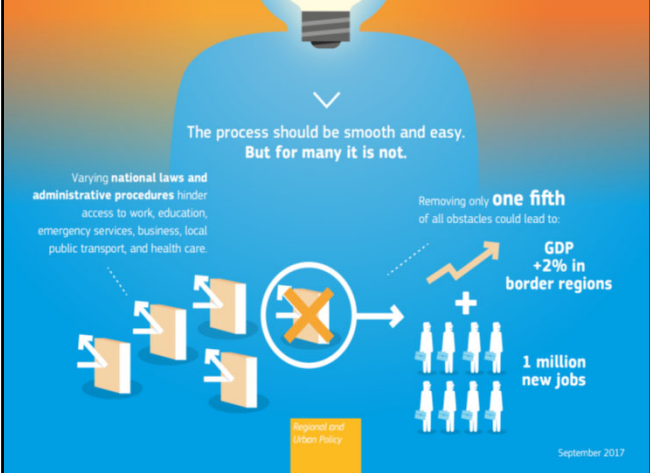
1 in 3 Europeans live in these regions – 150 million people

2 million EU citizens are frontier workers or students – they travel to work or school across a border daily or weekly.

EU, September 2017

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The process should be smooth and easy.
But for many it is not.

Varying national laws and administrative procedures hinder access to work, education, emergency services, business, local public transport, and health care.

Removing only one fifth of all obstacles could lead to:

GDP +2% in border regions

1 million new jobs

Regional and Urban Policy

September 2017

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These challenges will be addressed by the following 10 measures.

The creation of a 'Border Focal Point' within the Commission will facilitate and support their implementation.
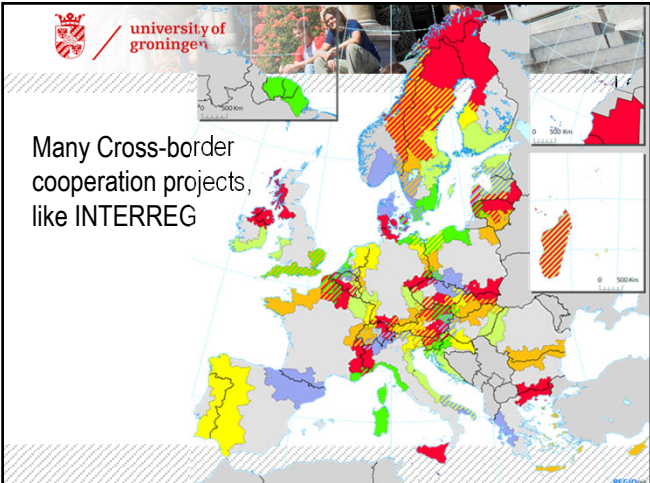
- deepen cooperation and exchanges
- improve the legislative process
- support cross-border employment
- promote border multilingualism
- facilitate cross-border accessibility
- e-government to enable cross-border public administration
- provide reliable and understandable information and assistance
- promote greater pooling of health care facilities
- consider the legal and financial framework for cooperation
- build evidence for better decision-making

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Many Cross-border cooperation projects, like INTERREG

REGIOgis

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Cross-border commuting is increasing over time, but flows are still small

Figure 1. Cross border commuting as percentage of the lagged employed labour force of the living countries for various compositions of the EU between 1998 and 2016.

Source: Eurostat – European Labour Force Survey

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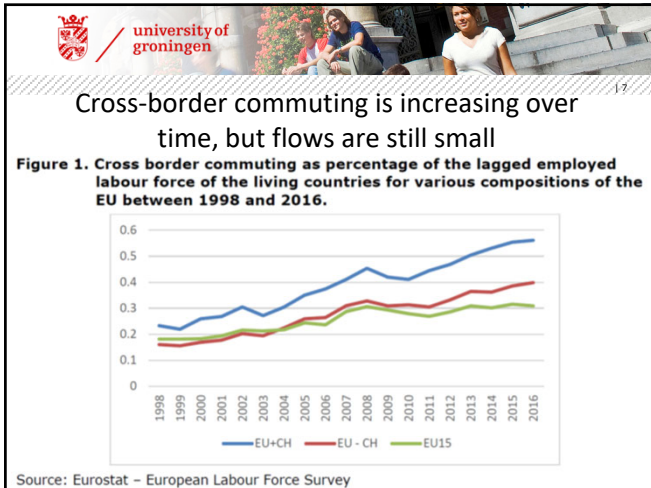
Cross-border commuting flows are small!

- In 2016 1.3 million persons commute cross-borders, where as this was only 450.000 in 1998. So, cross-border commuting tripled.
- But cross-border commuters are less than 0,6% as share of the labor force!
  → cross-border commuting flows are small!

Main questions:
- What drives cross-border commuting?
- What is the impact and what is the effect on (reducing) inequalities?
- Data EU + Switzerland from EUROSTAT for 1998 – 2016: flows are between countries!

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Various theoretical frameworks

- **Neo-classical framework:** driven by differences in economic factors on both sides of the border like wage and unemployment; rational choice.
- **Post-structural observations:** "mental thresholds", "bandwidth of unfamiliarity", "feel at home" and "common value patterns.
- **Economic geographical models** of uneven development / inequality; push and pull. factors with rational and emotional explanatory variables (home economicus vs home socialis).
- **Gravity model** can handle combinations.

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Empirical model based on the gravity model:

Commuting = Wage (origin, destin.) + Unemployment (o,d)
flows

$$\log\left(\frac{Y_{i,j,k,t}}{E_{j,k,t-1}}\right) = \rho + \alpha_1 \log\left(\frac{w_{i,k,t-1}}{h_{i,k,t-1}}\right) + \alpha_2 \log\left(\frac{w_{j,k,t-1}}{h_{j,k,t-1}}\right) + \beta_1 \log\left(\frac{u_{i,t-1}}{lf_{i,t-1}}\right) + \beta_2 \left(\frac{u_{j,t-1}}{lf_{j,t-1}}\right) +$$

+ Road density (o,d) + Distance + Language dummies

$$+\gamma_1 \log\left(\frac{road_{i,t-1}}{land_{i,t-1}}\right) + \gamma_2 \log\left(\frac{road_{j,t-1}}{land_{j,t-1}}\right) + \delta \log(dist_{i,j}) + \sum_l \theta_l D_{l,i,j} + \varepsilon_{i,j,k,t}.$$

Separate models by gender, education and age: Table 1
Data EU + Switzerland from EUROSTAT for 1998 – 2016:
Further check with sectoral models 2011 - 2016: Table 2

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Estimation results in Table 1:

constant	1.62 (2.37)	2.19 (3.20)	2.49 (3.57)	5.69 (3.27)	2.22 (3.17)	2.55 (4.06)	2.32 (3.37)	2.07 (2.94)
$\log\left(\frac{w_{i,t-1}}{h_{i,t-1}}\right)$	-0.61 (-8.61)	-0.68 (-9.38)	-0.52 (-7.13)	-0.56 (-6.46)	-0.71 (-9.85)	-0.47 (-6.39)	-0.69 (-9.44)	-0.64 (-8.59)
$\log\left(\frac{w_{j,t-1}}{h_{j,t-1}}\right)$	0.89 (12.32)	0.85 (11.47)	0.76 (9.75)	0.52 (5.46)	0.83 (11.22)	0.50 (6.96)	0.85 (11.32)	0.80 (10.44)
$\log\left(\frac{k_{i,t-1}}{land_{i,t-1}}\right)$	-0.05 (-0.63)	0.01 (0.18)	-0.06 (-0.77)	-0.14 (-1.69)	-0.06 (-0.75)	0.04 (0.54)	0.00 (0.03)	0.01 (0.15)
$\log\left(\frac{k_{j,t-1}}{land_{j,t-1}}\right)$	0.16 (2.40)	0.14 (2.13)	0.07 (1.04)	0.24 (3.07)	0.20 (2.96)	0.09 (1.48)	0.10 (1.48)	0.13 (1.79)
$\log\left(\frac{u_{i,t-1}}{lf_{i,t-1}}\right)$	0.33 (2.99)	0.29 (2.60)	0.29 (2.59)	0.67 (5.30)	0.46 (4.09)	-0.02 (-0.16)	0.38 (3.39)	0.13 (1.11)
$\log\left(\frac{u_{j,t-1}}{lf_{j,t-1}}\right)$	-0.22 (-2.04)	-0.25 (-2.32)	-0.14 (-1.21)	-0.03 (-0.27)	-0.40 (-3.62)	-0.06 (-0.57)	-0.30 (-2.77)	0.02 (0.21)
$\log(dist_{i,j})$	-0.61 (-4.93)	-0.60 (-4.75)	-0.77 (-6.03)	-0.79 (-5.35)	-0.63 (-4.91)	-0.53 (-4.58)	-0.65 (-5.19)	-0.64 (-5.02)
Common language dummy								
D_LANG_NL_BE	1.28 (4.70)	1.23 (4.52)	1.17 (4.35)	1.04 (3.57)	1.29 (4.72)	1.26 (5.11)	1.20 (4.41)	1.29 (4.73)
D_LANG_LU_BE_FR	1.95 (11.93)	1.58 (9.65)	1.61 (9.99)	1.18 (6.54)	1.48 (9.03)	1.72 (11.58)	1.72 (10.50)	1.46 (8.89)
D_LANG_LU_DU	1.11 (4.46)	0.97 (3.93)	1.11 (4.59)	0.24 (0.86)	1.01 (3.99)	1.20 (5.25)	1.12 (4.53)	0.96 (3.85)
D_LANG_CH_DE_AT	0.95 (5.62)	0.89 (5.29)	0.87 (5.23)	0.51 (2.75)	0.95 (5.60)	1.07 (7.05)	0.94 (5.61)	0.90 (5.30)
D_LANG_CH_FR	1.45 (5.40)	1.41 (5.25)	1.44 (5.53)	1.03 (3.65)	1.36 (5.10)	1.58 (6.65)	1.46 (5.47)	1.50 (5.60)
D_LANG_CH_IT	0.96 (3.46)	0.95 (3.45)	0.81 (3.03)	0.86 (3.06)	0.84 (3.08)	0.64 (2.64)	0.90 (3.26)	1.03 (3.75)
D_LANG_FI_EE	1.31 (4.34)	1.77 (5.60)	0.76 (2.25)	2.37 (6.05)	1.69 (5.52)	1.15 (3.51)	1.57 (4.86)	1.55 (4.49)
D_LANG_IE_UK	0.40 (1.42)	0.49 (1.76)	0.13 (0.45)	0.33 (1.10)	0.35 (1.26)	0.34 (1.38)	0.45 (1.58)	0.29 (1.04)
Adj R²	0.43	0.40	0.36	0.32	0.42	0.37	0.41	6

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Estimation results (1) main explanatory variables model:

	Total	Gender		Education			Age group	
		Male	Female	Low	Medium	High	15-44	45+
Intercept	1.62 (2.37)	2.19 (3.20)	2.49 (3.57)	5.69 (3.27)	2.22 (3.17)	2.55 (4.06)	2.32 (3.37)	2.07 (2.94)
Wage - O	-0.61 (-8.61)	-0.68 (-9.38)	-0.52 (-7.13)	-0.56 (-6.46)	-0.71 (-9.85)	-0.47 (-6.39)	-0.69 (-9.44)	-0.64 (-8.59)
Wage - D	0.89 (12.32)	0.85 (11.47)	0.76 (9.75)	0.52 (5.46)	0.83 (11.22)	0.50 (6.96)	0.85 (11.32)	0.80 (10.44)
Unem - O	0.33 (2.99)	0.29 (2.60)	0.29 (2.59)	0.67 (5.30)	0.46 (4.09)	-0.02 (-0.16)	0.38 (3.39)	0.13 (1.11)
Unem - D	-0.22 (-2.04)	-0.25 (-2.32)	-0.14 (-1.21)	-0.03 (-0.27)	-0.40 (-3.62)	-0.06 (-0.57)	-0.30 (-2.77)	0.02 (0.21)
Road - O	-0.05 (-0.63)	0.01 (2.13)	-0.06 (-0.77)	-0.14 (-1.69)	-0.06 (-0.75)	0.04 (0.54)	0.00 (0.03)	0.01 (0.15)
Road - D	0.16 (2.40)	0.14 (2.13)	0.07 (1.04)	0.26 (3.07)	0.20 (2.96)	0.09 (1.48)	0.10 (1.48)	0.13 (1.79)
Distance	-0.61 (-4.93)	-0.60 (-4.75)	-0.77 (-6.03)	-0.79 (-5.35)	-0.63 (-4.91)	-0.53 (-4.58)	-0.65 (-5.19)	-0.64 (-5.02)

O = Origin, D= Destination. Figures in Bold: significant

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Estimation results (2) (Similar) Language dummies:

Language Dummies	Total	Gender		Education			Age group	
		Male	Female	Low	Medium	High	15-44	45+
BE - NL	1.28 (4.70)	1.23 (4.52)	1.17 (4.35)	1.04 (3.57)	1.29 (4.72)	1.26 (5.11)	1.20 (4.41)	1.29 (4.73)
BE–FR-LU	1.95 (11.93)	1.58 (9.65)	1.61 (9.99)	1.18 (6.54)	1.48 (9.03)	1.72 (11.58)	1.72 (10.50)	1.46 (8.89)
GER - LU	1.11 (4.46)	0.97 (3.93)	1.11 (4.59)	0.24 (0.86)	1.01 (3.99)	1.20 (5.25)	1.12 (4.53)	0.96 (3.85)
AT-GER-CH	0.95 (5.62)	0.89 (5.29)	0.87 (5.23)	0.51 (2.75)	0.95 (5.60)	1.07 (7.05)	0.94 (5.61)	0.90 (5.30)
FR - CH	1.45 (5.40)	1.41 (5.25)	1.44 (5.53)	1.03 (3.65)	1.36 (5.10)	1.58 (6.65)	1.46 (5.47)	1.50 (5.60)
IT - CH	0.96 (3.46)	0.95 (3.45)	0.81 (3.03)	0.86 (3.06)	0.84 (3.08)	0.64 (2.64)	0.90 (3.26)	1.03 (3.75)
EST - FI	1.31 (4.34)	1.77 (5.60)	0.76 (2.25)	2.37 (6.05)	1.69 (5.52)	1.15 (3.51)	1.57 (4.86)	1.55 (4.49)
IE - UK	0.40 (1.42)	0.49 (1.76)	0.13 (0.45)	0.33 (1.10)	0.35 (1.26)	0.34 (1.38)	0.45 (1.58)	0.29 (1.04)
Adj. R2	0.43	0.40	0.36	0.32	0.42	0.37	0.41	0.36
N. Observ.	1125	1103	1011	826	1049	997	1088	1036

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Conclusions Empirical Results:

- Wages: in line with expectations higher wages in origin lower commuting and higher wages in destination increase commuting. **Push effect < Pull effect.**
- Unemployment: in line with expectations higher unemployment in origin increases commuting and higher unemployment in destination lowers commuting. **Push effect > Pull effect.**
- Road accessibility: expectation is that better roads in origin might as well lower as increase commuting, while in destination it will increase commuting. Only the latter effect in destination is significant.
- Larger distances (large countries) show as expected lower commuting rates
- Common language increases commuting, except for Ireland – UK!
- By gender, age and educational group not much differences: effects for women and high educated are often smaller and insignificant.
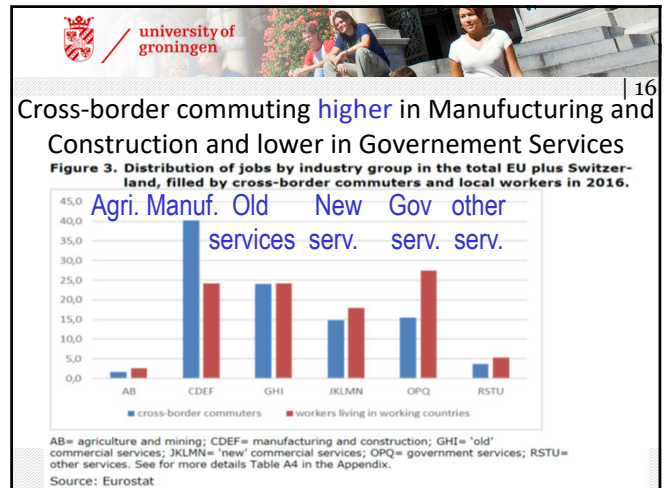
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Further check with models by sector for the period 2011-2016:

- Four broad sectors:
  - Manufacturing & Construction (including Energy / Water Supply and Waste Control)
  - 'Old' Services: Trade, Transport and Storage, Hotels, restaurants and café's
  - 'New' Services: Information and Communication, Financial Services, Rent & Trade of Real Estate, Specialist Business Services, Rent and other business services
  - Government Services: Public Administration & Public Services, Education, Health Care and Welfare Services
- **Not** taken into account (many low/missing observations): Agriculture & Mining, Culture, Sports & Recreation and Other Services
- Sectoral Wages are only available for the shorter period 2011-2016.

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Cross-border commuting higher in Manufacturing and Construction and lower in Governement Services

Figure 3. Distribution of jobs by industry group in the total EU plus Switzerland, filled by cross-border commuters and local workers in 2016.

AB= agriculture and mining; CDEF= manufacturing and construction; GHI= 'old' commercial services; JKLMN= 'new' commercial services; OPQ= government services; RSTU= other services. See for more details Table A4 in the Appendix.
Source: Eurostat

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Estimation results (1) with sector-specific wages:

	Total	Manu-facturing	Old Services	New Services	Govern Services
Intercept	3.55 (2.40)	4.11 (2.27)	3.25 (1.99)	3.62 (2.04)	4.73 (3.40)
Wage – O, S	-0.02 (0.10)	0.13 (0.65)	0.11 (0.57)	0.73 (3.39)	-0.81 (5.71)
Wage – D, S	0.39 (2.63)	-0.09 (-0.49)	0.15 (0.91)	-0.30 (-1.50)	0.74 (6.14)
Unem – O	1.13 (4.14)	0.95 (2.84)	0.65 (2.10)	1.00 (3.04)	-0.53 (1.93)
Unem – D	-1.13 (4.52)	-1.07 (3.18)	-0.86 (2.86)	-0.99 (3.00)	0.07 (0.25)
Road – O	-0.62 (4.06)	-0.94 (5.02)	-0.82 (5.00)	-0.80 (4.22)	-0.16 (1.13)
Road – D	0.89 (5.98)	1.05 (5.59)	0.81 (5.02)	0.67 (3.79)	0.27 (1.88)
Distance	-0.89 (3.39)	-0.74 (2.30)	-0.66 (2.27)	-0.89 (2.83)	-0.77 (3.26)

Bold: significant

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Estimation results (2) Language dummies:

Language Dummies	Total	Manu-facturing	Old Services	New Services	Govern Services
BE - NL	0.66 (1.09)	0.95 (2.84)	0.65 (2.10)	0.84 (1.29)	1.02 (2.02)
BE – FR - LU	1.57 (4.35)	-1.07 (3.18)	-0.86 (2.86)	1.37 (3.47)	1.43 (4.42)
GER - LU	0.93 (1.66)	-0.94 (5.02)	-0.82 (5.00)	1.38 (2.34)	1.18 (2.47)
AT – GER - CH	0.62 (1.69)	1.05 (5.59)	0.81 (5.02)	1.78 (3.98)	1.66 (4.63)
FR - CH	0.81 (1.50)	-0.74 (2.30)	-0.66 (2.27)	3.22 (4.08)	3.81 (6.15)
IT - CH	0.70 (1.31)	0.95 (2.84)	0.65 (2.10)	1.87 (2.38)	1.86 (3.00)
EST - FI	1.76 (3.14)	-1.07 (3.18)	-0.86 (2.86)	1.43 (1.78)	-0.72 (-1.06)
IE - UK	0.76 (1.35)	-0.94 (5.02)	-0.82 (5.00)	0.51 (0.82)	0.91 (1.93)
Adj. R2	0.38	0.37	0.36	0.32	0.48
N. Observ.	409	341	339	304	309

Conclusions Empirical Results Sectoral models:

- Results for the overall model for the shorter period 2011-2016 are largely the same, but wage in living country are insignificant, while share of motorways is now significant negative in living country; several language dummies are also insignificant.
- Sectoral wages are for most sectoral models insignificant. For New Services high wages in the living country is positive significant in contrast to expectations. This is the only anomaly! For Government Services both wage coefficients are significant with the expected sign, but for Government Services cross-borders commuting is not very likely!
- All other coefficients (unemployment, motorways, distance, language) are in line with the results in Table 1 for the period 1998 - 2016 with the exception for a few language dummies and for Government Services for unemployment in the living country and motorways in the working country.

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Conclusions

- Cross-border commuting flows are very small but increase over time 1998-2016.
- Potential gains: more economic activity due to scale and agglomerations effects, better matching and lower unemployment.
- Empirical results: lower wages and higher unemployment in the origin significantly increase commuting (push-effect) and lower the pull effect from destination countries; magnitude differs a bit by gender, education and age and is not always significant for all sub-groups.
- Accessibility by motorways in the destination country has a significant positive effect on cross-border commuting, but is insignificant for the country of origin.
- Common language on both size of the borders increases commuting, with the exception of Ireland - UK.
- Distance show a significant negative effect, implying that big countries show smaller cross-border commuting flows
- Models by sector for 2011-2016 perform rather similar, but sectoral wages are insignificant or show unexpected results.
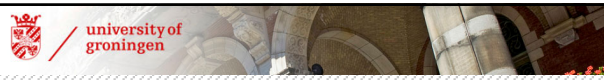
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Effect on Inequality and Policy Implications

- Cross-border commuting flows respond in general in the theoretically expected way to wages, unemployment, accessibility, language similarity and distance.
- → cross-border commuting may help to reduce economic and territorial inequality!
- The effects are small also because the relatively small number of commuters
- The results differ by gender, education and age, sector and time period implying that for some groups the reduction in inequality might be very limited or might increase for groups who are less mobile or less responsive to differences in wages, unemployment and accessibility.
- Policy measures aimed at improving economic conditions in the living region of origin might reduce the need for cross-border commuting.
- Policy measures aimed to improve accessibility and reduce language and institutional barriers might help to further enhance cross-border mobility and, hence, reduce inequalities between border regions in different countries, but also between regions within a country if peripheral border regions are able to catch-up.

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Thank you for your attention

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Department of Economics, University of Macedonia, Monday, April 18th, 2022.

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