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The Effect of Tourism on Income Inequality Reduction in Welfare States: Evidence From the European Country Clusters

Abstract

This study explores tourism's impact on income inequality across the EU's five welfare systems from 2000 to 2021. A vector error correction model showed that increased international tourism receipts decrease income inequality by increasing the share of the mid-income, reducing the share of the highest income and minimally changing the share of the lowest income groups. Across welfare systems, tourism receipts decrease the share of the lowest income in the Nordic and Anglo-Saxon clusters; reduce inequality in the Mediterranean, and increase inequality in the Eastern European cluster. This research underscores the role of tourism in income redistribution, urging tailored policies based on regional tourism spending and welfare state capacity.

Keywords: tourism; income inequality, European Union, welfare states, sustainable development

1. Introduction

Income inequality (II), poverty, and deprivation result from the interplay among market dynamics, governmental policies, and household strategies. Welfare states play a crucial role in addressing these issues by influencing income distribution through initial economic support and subsequent redistribution (Hacker, 2011). Their primary goal is to provide financial and social security to all citizens (Milotay & Noonan, 2022). Welfare systems are categorised based on criteria such as decommmodification, social stratification, and the balance between public and private welfare provision, as outlined by Esping-Andersen (1990). According to this framework, European welfare states are commonly grouped into three categories: Central European, Anglo-Saxon, and Nordic. Hajighasemi (2019) extends this classification to include Mediterranean and Eastern European welfare systems. These five welfare models form the foundation for the present study.

Tourism is a cornerstone of many economies, fosters social bonds, and promotes peace among nations (UNWTO [United Nations World Tourism Organization], 2018). Its economic significance extends globally, with tourism-led growth observed in developing countries and welfare states like those in the EU (Matošević Radić, 2014; Shahzad et al., 2017; Xia et al., 2022). Before the COVID-19 pandemic, tourism contributed 10.3% to global GDP and supported one in four jobs worldwide (UNWTO, 2022). Regionally, tourism catalyses development and mitigates economic disparities (Proença & Soukiazis, 2008). In the EU, tourism contributes 9.9% to GDP and employs 23.5 million people, predominantly women, youth, and migrants (UNWTO, 2018; 2022). Despite setbacks from the pandemic, forecasts suggest a return to pre-pandemic tourism levels by 2024, with a recovery trajectory evident in global GDP contributions (WTTC [World Travel & Tourism Council], 2024).

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This paper aims to underscore the role of tourism receipts in reducing income inequalities, benefiting both businesses and communities. Specifically, it examines the impact of tourism on II across different welfare systems in the EU. The study employs a methodological approach that distinguishes between the long-run and short-run effects of international tourist receipts on II. Furthermore, by analysing data from five EU-27 welfare state clusters, the study compares how tourism affects II within distinct institutional settings. Lastly, it provides insights into the distribution of receipt flows among five income groups, offering a comprehensive analysis of tourism's socio-economic impacts within the EU context.

The following section describes the role of tourism in economic growth. It depicts its influences on national welfare, and II represents the basis for defining the research model and hypotheses. The third section explains the research methodology and describes the variables. The fourth section displays the analysis results, while the subsequent section discusses the findings relating to each EU welfare cluster. The final section concludes the paper with managerial and policy implications of the results.

2. Literature review

2.1. Income inequality and welfare states

Reducing economic inequality and promoting social inclusion are critical global priorities recognized by the United Nations through Sustainable Development Goal (SDG) 10, which aims to increase the income of the poorest 40% and reduce inequalities based on various factors, including income, gender, age, and ethnicity through policy and legislation (United Nations, 2022). Recent trends have shown increasing II both within and among countries, contrary to expectations, exacerbated by events such as the COVID-19 pandemic and the conflict in Ukraine. Addressing economic inequality is crucial due to its detrimental impacts on poverty levels, access to essential services like healthcare and education, and overall social stability, necessitating political will and strategic solutions that intersect with other SDGs.

Inequality manifests within and between nations, and addressing internal disparities requires tailored national policies (Center for Economic and Social Rights, 2016). Globally, reducing economic inequality among countries involves fair trade agreements, transparent financial systems, and effective global governance structures. Establishing robust welfare systems within countries plays a pivotal role in mitigating inequality by safeguarding individuals against market risks and ensuring equitable distribution of economic outcomes.

European Union member states, often characterized as welfare states, prioritize equal opportunity as a cornerstone of economic and social development. While each country maintains its distinct welfare policies, they align under a common framework promoting social cohesion and sustainable growth. The EU, as a global leader, shoulders responsibility for proposing and implementing measures to reduce inequality regionally and globally despite ongoing disparities in GDP and income within its member states (Eurostat, 2022).

European welfare regimes typically fall into three primary clusters—Central European, Anglo-Saxon, and Nordic—as defined by Esping-Andersen (1990). Additionally, Hajighasemi (2019) identifies Mediterranean and Eastern European models, delineating five distinct welfare clusters: Central European (France, Austria, Germany, Belgium, Netherlands, Luxembourg), Anglo-Saxon (Ireland), Nordic (Finland, Denmark, Sweden), Mediterranean (Croatia, Malta, Cyprus, Italy, Spain, Portugal, Greece), and Eastern European (Poland, Hungary, Czech Republic, Romania, Bulgaria). These clusters shape national social policies within the EU, contributing to its renowned "European social model" that seeks to balance economic growth with social equity and inclusion.

2.2. Tourism and income inequality

Various policies and institutions are crucial in mitigating inequality, encompassing education, labour market interventions, and tax systems. Additionally, different economic sectors, such as agriculture and trade, are

recognized for their potential contributions to inequality reduction. While tourism is primarily understood to bolster economic growth and alleviate poverty, empirical findings on its impact on inequality are mixed.

Fang et al. (2020) examined 102 economies from 1995 to 2014, finding that tourism negatively affects inequality in developing countries but has negligible effects in developed ones. Conversely, Nguyen et al. (2020) analysed 97 countries across 2002–2014, demonstrating that tourism tends to increase II in lower-income countries, mitigated by redistributive policies. Zhang (2021) conducted a meta-analysis affirming tourism's significant positive effect on II. In contrast, Chiu and Wang (2022) explored 102 countries using a panel smooth transition regression model, revealing that inbound tourism initially reduces II, but this effect diminishes with banking sector development. Reis (2021) investigated 95 low- and middle-income countries from 1995 to 2018, finding tourism's potential to alleviate extreme poverty and II, excluding low-income countries. Lv (2019) analysed 113 countries from 1995 to 2012, concluding that tourism negatively impacts regional inequality, promoting balanced regional development.

The heterogeneous economic impact of tourism is evident across the European Union member states, as influenced by varying tourist product offerings and sectoral linkages (Figini & Patuelli, 2022). Radić et al. (2021) used econometric techniques to reveal a significant but weaker-than-expected relationship between tourism and economic growth convergence in the EU. Subramaniam et al. (2022) analysed nine countries from 2001 to 2016, illustrating tourism's potential to reduce II. A research question arises from the above-stated: *How do international tourist receipts affect income inequality?*

The following hypotheses are formulated based on the research question:

H1: International tourist receipts statistically significantly and positively affect a decrease in income inequality.

H2: An increase in the middle-income share of the population causes a decrease in income inequality from international tourist receipts.

3. Methodology

This paper examines the link between the tourism inflows regarding international tourist receipts on II in five European welfare systems measured by the Gini coefficient and income distribution between five quintiles.

3.1. Dependent variables

II is measured with World Bank data on the Gini coefficient and income quintiles. The Gini coefficient assesses income distribution within a population, ranging from 0 (complete equality) to 1 (complete inequality). Typically, developing countries exhibit higher Gini coefficients, indicating greater inequality, while developed countries show lower coefficients.

Income quintiles divide the population into five groups based on income, each representing 20% of the population. The lowest income group comprises the bottom 20%, while the highest income group includes the top 20%. This study examines the impact of international tourist receipts on each income quintile: lowest, second, third, fourth, and highest.

3.2. Independent variable

The effect of tourism on II is analysed using international tourist receipts, defined as expenditures by international visitors, including payments for international transport and prepayments for goods and services in the destination country using the World Bank data (2022). The receipts are reported in current US\$ and adjusted using a GDP deflator for within-country comparisons.

3.3. Control variables

The model incorporates several variables influencing the interplay between tourism and II. Notably, gross domestic product (GDP) size is pivotal, as more extensive national economic activities correlate with higher GDP levels. Previous research indicates that increasing national income fosters convergence between countries (Knack, 1996; Reza & Zahra, 2008). Conversely, within-country studies reveal divergences, highlighting scenarios where income inequalities exacerbate, perpetuating wealth disparities (Hickel, 2017). Another controlled variable is the (un)employment rate, calculated as the proportion of unemployed individuals in the labour force, based on estimates from the International Labour Organization sourced from the World Bank database. Higher employment rates are expected to impact income outcomes. Additionally, industry size is another control variable that reflects the manufacturing sector's value-added as a percentage of GDP, obtained from the World Bank database.

All variables are in logarithmic form to minimize discrepancies in data, with summary statistics of the variables in Table 1 and correlation coefficients in Table 2.

Table 1
Summary of variables

Variable	Number of observations	Mean	Standard deviation	Minimum	Maximum
International tourist receipts	458	22.64	1.15	19.56	25.00
Gini	446	3.44	0.12	3.14	3.72
Lowest 20	446	2.05	0.16	1.59	2.34
Fourth 20	446	3.12	0.03	3.03	3.21
Third 20	446	2.84	0.04	2.70	2.95
Second 20	446	2.57	0.07	2.38	2.73
Highest 20	446	3.67	0.07	3.48	3.86
GDP	594	11.91	1.52	8.76	14.99
Unemployment rate	594	2.04	0.47	0.59	3.31
Industry	572	2.64	0.38	1.36	3.61

Source: World Bank and Eurostat. Authors' calculation.

Table 2
Correlation coefficients

Variable	1	2	3	4	5	6	7	8	9	10
International tourist receipts	1									
Gini	0.13	1								
Lowest 20	0.00	-0.90	1							
Fourth 20	-0.18	0.07	-0.42	1						
Third 20	-0.14	-0.82	0.52	0.41	1					
Second 20	-0.10	-0.98	0.88	-0.09	0.82	1				
Highest 20	0.15	0.98	-0.80	-0.13	-0.91	-0.97	1			
GDP	0.87	0.03	0.03	-0.10	-0.01	0.00	0.03	1		
Unemployment rate	0.08	0.30	-0.35	0.07	-0.12	-0.24	0.26	-0.01	1	
Industry	-0.01	-0.32	0.16	0.14	0.36	0.35	-0.35	0.26	-0.12	1

Source: World Bank and Eurostat. Authors' calculation.

Levin, Lin and Chu (2002) augmented Dickey-Fuller (Dickey & Fuller, 1981) and Phillips Perron (1988) tests are used to check for the stationarity of the series. Fisher-type tests (ADF and PP) are performed at one lag without a constant or trend. All variables are non-stationary at level and stationary when first differenced apart from the control variable industry, which is stationary at level.

Johansen Fisher panel cointegration test with trend and intercept and no trend in the vector autoregression examined cointegration between international tourist receipts, Gini coefficient, and international tourist

receipts and each quintile income group (Maddala & Wu, 1999). All groups of relationships show at least one cointegrating relationship between inspected variables. Hence, a vector error correction model examines the short-run and long-run causalities between variables. Short-run causality is examined using the Wald coefficient test and a long-run causality by error correction model. VECM equation states:

$$\Delta Y_t = \lambda \Delta X_t + \pi \hat{\varepsilon}_t + a_t \quad (1)$$

where $\lambda \Delta X_t$ Represents short-term dynamics and $\pi \hat{\varepsilon}_t$ Represents long-term dynamics and error correction term $\hat{\varepsilon}_t$ reduces the difference between Y_{t-1} . Error correction term $\hat{\varepsilon}_t$ is estimated value:

$$\hat{\varepsilon}_{t-1} = Y_{t-1} - (\hat{\beta}_0 + \hat{\beta}_1 X_{t-1}) \quad (2)$$

π indicates a speed of adjustment to equilibrium state. If $\pi < 0$, then Y_t decreases because of deviation from the equilibrium state. If $\pi > 0$, then Y_t increases because of deviation from the equilibrium state. The process of adjustment to or from the equilibrium state is the result of the cointegration of the two variables, which restricts the long-run error terms increase. Lags were selected based on the lag length criteria, following a principle of no unit root relationship given an autoregressive root table in vector autoregression. Finally, VECM was specified using determined lags.

4. Results

Results of the VECM model for the whole EU-27 sample are given in Table 3, while VECM for each of the five European Union welfare clusters is available in Appendix 1.

Table 3
Results of the VECM for the EU27

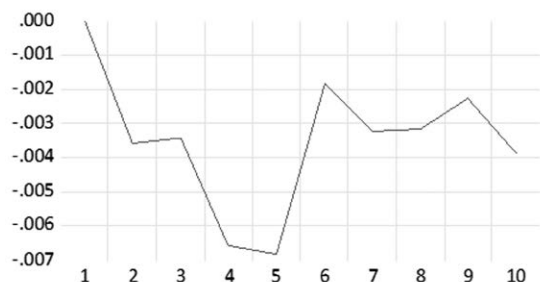
	M1	M2	M3	M4	M5	M6
	Dependent variable					
	Gini	Lowest 20	Fourth 20	Third 20	Second 20	Highest 20
Constant	-0.00 (0.03)	0.02 (0.03)	-0.00 (0.01)	-0.02 (0.01)	-0.01 (0.02)	0.00 (0.02)
Error correction term	-0.04† (0.02)	-0.03† (0.02)	-0.03 (0.03)	-0.06† (0.03)	-0.05* (0.02)	-0.05† (0.03)
Wald coefficient test (χ^2)	10.72†	3.43	6.03	11.83*	15.87**	13.16*
GDP	0.00 (0.00)	-0.00 (0.00)	-0.00 (0.00)	0.00 (0.00)	-0.00 (0.00)	0.00 (0.00)
Unemployment rate	0.00 (0.00)	-0.00 (0.00)	0.00 (0.00)	0.00 (0.00)	-0.00 (0.00)	0.00 (0.00)
Industry	-0.01† (0.01)	0.01 (0.01)	-0.00 (0.00)	0.00 (0.00)	0.01* (0.00)	-0.01† (0.00)
R2	0.19	0.11	0.18	0.24	0.21	0.22
Adjusted R2	0.12	0.03	0.10	0.17	0.14	0.15
Standard error of the regression	0.03	0.03	0.01	0.01	0.02	0.02
Log-likelihood	377.80	344.41	558.10	510.62	453.68	458.60
Akaike AIC	-4.24	-3.85	-6.35	-5.80	-5.13	-5.19
Durbin Watson	2.00	2.07	1.96	2.03	2.13	2.01
Number of observations	174	174	174	174	174	174
Autocorrelation LM test (at lag 6)	2.70	2.82	1.46	3.13	0.97	2.51
White test (with cross terms)	355.86	335.961	358.339	385.973	362.415	382.01
Lags	5	5	5	5	5	5

Source: World Bank and Eurostat. Authors' calculation.

** p - value < 0.01 * p - value < 0.05 † p - value < 0.1. Standard errors in parentheses. Three control variables are real GDP, unemployment rate, and industry share in GDP. The error correction term shows the speed of long-run adjustment, and the Wald coefficient shows the significance of a short-run relationship.

VECM for the whole sample of the EU-27 member states shows a long-run causality between international tourist receipts and inequality at the 10% significance level (Table 3). Wald coefficient test indicates a statistically significant short-run causality between international tourist receipts and inequality at a 10% significance level. Figure 1 portrays the impulse response function of the effect of one standard deviation shock in international tourist receipts on the Gini coefficient for ten periods, implying a negative impact of international tourist receipts on II measured with the Gini coefficient.

Figure 1
The impulse response function of Gini to innovation in international tourist receipts: EU27



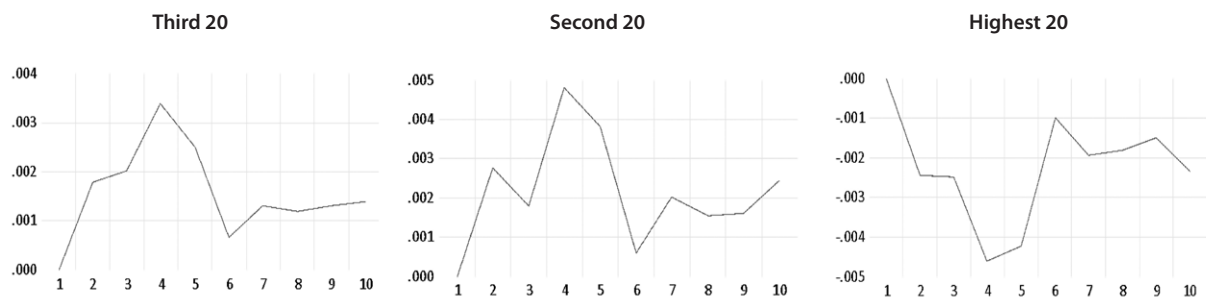
Shock in Cholesky one standard deviation (d.f. adjusted).

Source: World Bank and Eurostat. Authors' representation.

Further analysis reveals that neither the lowest nor the fourth income quintile exhibit statistically significant effects of international tourist receipts on II, when measured with the Gini coefficient. Hence, the impulse response functions for these groups are not presented. This finding is noteworthy, however, as it indicates that changes in international tourist receipts do not impact the income shares of the two lowest income groups.

The analysis indicates a statistically significant short-run causality from international tourist receipts that increases the share of the third, median, quintile (Table 3). Additionally, long-run and short-run causality from international tourist receipts increases the second quintile's share (Figure 2). Conversely, a statistically significant short-run causality exists in the highest income quintile, reducing its income share. This suggests that increases in the shares of the third and second quintiles are associated with a decrease in the share of the highest quintile within the EU27.

Figure 2
The impulse response function of quintile income share groups to innovation in international tourist receipts: EU27



Shock in Cholesky one standard deviation (d.f. adjusted).

Source: World Bank and Eurostat. Authors' representation.

5. Discussion

This paper aimed to examine the effect of international tourist receipts on II. Two hypotheses arose from the research question: *Hypothesis 1* tested the impact of international tourist receipts on a decrease in II; *Hypothesis 2* suggested that the rise in income equality comes from an increase in the middle-income groups. Both hypotheses were tested using a panel VECM, which allowed the inspection of short-run and long-run effects of independent variables towards dependent variables. In cases when all EU member states were examined, *Hypothesis 1* was confirmed at a 10% significance level, and *Hypothesis 2* was confirmed in the short run for the middle-income group.

The hypotheses were tested using clusters of five EU member states based on welfare analysis (Esping-Andersen, 1990; Hajjighasemi et al., 2022). The panel VECM results (Appendix 1) and impulse response functions (Appendix 2) reveal varied effects of tourist receipts on II across these clusters.

In the Nordic cluster, the effect of tourist receipts on II is statistically insignificant, except for a significant long-run decrease in the income share of the lowest quintile, contributing to a slight rise in income equality (Table A1.1). In the Anglo-Saxon cluster, represented solely by the Republic of Ireland, there is a significant decrease in the lowest and second quintiles' income shares in the long and short run (Table A1.2).

For the Central European cluster, there is a long-run decrease in II at a 10% significance level across all quintiles except the second, which remains statistically insignificant. Short-run effects are not significant (Table A1.3). The Eastern European cluster deviates from the other clusters, showing an increase in II in the short run, evident in a decrease in the fourth quintile's income share and an increase in the highest two quintiles (Table A1.4).

An increase in international tourist receipts in the Mediterranean cluster leads to a long-run decrease in II, consistently across all income groups (Table A1.5). Thus, Hypotheses 1 and 2 are supported in the Mediterranean cluster, partially supported in the Nordic and Anglo-Saxon clusters, and not supported in the Eastern European cluster.

This analysis demonstrates that international tourist receipts primarily reduce II in the long run. Previous studies have focused on short-run effects (Mahadevan & Suardi, 2019), examined tourism within various institutional settings (Zhang, 2021), or compared developed and developing countries (Fan et al., 2020). Despite variations in tourism's share of GDP within the European Union, the tourism-led growth hypothesis is confirmed (Matošević Radić, 2014; Shahzad et al., 2017; Xia et al., 2022). In our study, international tourist arrivals and receipts predominantly benefit seaside member states, particularly in the Mediterranean, where increased tourist receipts correlate with reduced II. Conversely, our findings in the Eastern European cluster align with Nguyen et al. (2020) and Subramaniam et al. (2022), who reported that tourism increases II.

6. Conclusion

This paper examines the effect of tourism on income inequality (II) across five welfare systems: Nordic, Central European, Anglo-Saxon, Eastern European, and Mediterranean. A vector error correction model was applied using panel data from 27 EU member states between 2000 and 2021. The results indicate that increased international tourist receipts reduce II, as measured by the Gini coefficient, by increasing the shares of the second and third income quintiles and decreasing the share of the highest quintile. However, the shares of the two lowest income quintiles remain unchanged. Among the five EU welfare systems, increased international tourist receipts do not affect the Central European cluster but reduce the share of the lowest income group in the Nordic and Anglo-Saxon clusters. In the Mediterranean cluster, increased tourist receipts lead to reduced inequality, whereas in the Eastern European cluster, they result in increased inequality.

This study underscores the role of tourism in reducing II and redistributing wealth, aligning with findings by Williams and Shaw (1991). The magnitude of international tourist receipts—reflecting tourist spending within a country—emerged as a significant predictor of II reduction. The share of travel and tourism in GDP also serves as a meaningful indicator of tourism's impact on II. Member states with a higher GDP share from tourism and existing II could enhance their outcomes through policies promoting inclusive employment. Conversely, states experiencing increased II due to rising international tourist receipts could benefit from comparative analyses of policies, tourism types, and employee compensation to foster more significant social equity.

As the European Union welfare states differ in their ability to absorb the influx of international tourist receipts positively, practitioners could consider differences in tourist spending in different regions by re-branding and offering tourist packages and promotions for special interest tourists. As a result of global warming, inland tourism is bound to become more attractive, especially when packaged holidays and promotions are offered.

This research has several limitations. Firstly, it focuses on European Union member states, predominantly high-income OECD countries. While income variations exist within these clusters, a more detailed analysis would clarify the effects of international tourist receipts on II. Secondly, examining within-country variations, particularly at the NUTS regional level, would provide insights into regional differences. Thirdly, analysing the type and differentiation of tourist receipts could enhance understanding of tourist spending patterns and the services receiving these payments, but data for this analysis was unavailable. Fourthly, the industry's size was used to capture economic capital, which could affect II, but factors like financial market development were not included. Lastly, the share of tourism in GDP was not considered due to member states' clustering and the industry's insignificant effect on II.

Future research should consider regional stratification, including the share of tourism in GDP for each country, and focus on the different types of tourism offered by various regions, recognizing that tourism services in Eastern Europe differ from those in Mediterranean Europe. Examining tourist services would provide better insights into activities contributing to reducing II. Additionally, future studies should factor in the number of tourist arrivals to assess the joint impact of tourist receipts per person, distinguishing between spending on tourism across different regions.

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Appendix 1

Table A1.1

Results of the VECM for the Nordic welfare states

	M1	M2	M3	M4	M5	M6
	Dependent variable					
	Gini	Lowest 20	Fourth 20	Third 20	Second 20	Highest 20
Constant	-0.60 (0.46)	-0.19 (0.26)	0.20 (0.15)	0.27 (0.22)	0.29 (0.21)	-0.42 (0.27)
Error correction term	0.03 (0.03)	-0.47** (0.16)	0.00 (0.00)	0.04 (0.04)	0.05 (0.04)	0.03 (0.02)
Wald coefficient test (χ^2)	0.01	0.30	1.47	0.14	0.72	0.11
GDP	0.05 (0.04)	0.03 (0.02)	-0.02 (0.01)	-0.02 (0.02)	-0.03 (0.02)	-0.04 (0.02)
Unemployment rate	0.01 (0.02)	-0.04* (0.02)	-0.00 (0.01)	-0.00 (0.01)	-0.00 (0.01)	0.01 (0.01)
Industry	-0.03 (0.02)	-0.04 (0.02)	0.02† (0.01)	0.01 (0.01)	0.01 (0.01)	-0.02 (0.01)
R2	0.18	0.39	0.27	0.16	0.27	0.22
Adjusted R2	0.01	0.26	0.12	-0.02	0.11	0.06
Standard error of the regression	0.02	0.02	0.01	0.01	0.01	0.01
Log-likelihood	92.17	91.41	129.29	119.08	123.08	112.53
Akaike AIC	-4.87	-4.82	-6.99	-6.41	-6.63	-6.03
Durbin Watson	2.22	1.85	2.18	1.93	2.03	2.13
Number of observations	37	37	37	37	37	37
Autocorrelation LM test (at lag 6)	2.01	5.88	1.34	0.55	1.56	0.73
White test (with cross terms)	73.92	82.85	87.82	75.33	89.51	76.07
Lags	1	1	1	1	1	1

Source: World Bank and Eurostat. Authors' calculation.

** p - value < 0.01 * p - value < 0.05 † p - value < 0.1. Standard errors in parentheses. Three control variables are real GDP, unemployment rate, and industry share in GDP. The error correction term shows the speed of long-run adjustment, and the Wald coefficient shows the significance of a short-run relationship.

Table A1.2
Results of the VECM for the Anglo-Saxon welfare state

	M1	M2	M3	M4	M5	M6
	Dependent variable					
	Gini	Lowest 20	Fourth 20	Third 20	Second 20	Highest 20
Constant	6.33** (1.93)	-7.29** (1.08)	-1.48 (1.20)	0.48 (1.92)	-4.51** (1.39)	3.65* (1.62)
Error correction term	-0.15† (0.08)	-0.42** (0.09)	0.04 (0.06)	-0.24 (0.26)	-0.22* (0.10)	-0.08 (0.07)
Wald coefficient test (χ^2)	3.09†	14.54**	0.17	-0.00	2.80†	1.40
GDP	-0.57** (0.16)	0.64** (0.09)	0.14 (0.10)	-0.03 (0.17)	0.40** (0.12)	-0.33* (0.14)
Unemployment rate	-0.06 (0.04)	0.06** (0.02)	0.02 (0.02)	-0.02 (0.03)	0.06† (0.03)	-0.03 (0.03)
Industry	0.26** (0.06)	-0.24** (0.05)	-0.08* (0.04)	-0.04 (0.07)	-0.16** (0.04)	0.17** (0.05)
R2	0.79	0.90	0.68	0.57	0.72	0.71
Adjusted R2	0.62	0.83	0.44	0.24	0.51	0.49
Standard error of the regression	0.02	0.02	0.01	0.02	0.01	0.01
Log-likelihood	43.34	46.16	53.46	46.68	48.80	46.94
Akaike AIC	-4.85	-5.22	-6.20	-5.29	-5.57	-5.33
Durbin Watson	2.47	1.56	2.66	2.84	2.36	2.60
Number of observations	15	15	15	15	15	15
Autocorrelation LM test (at lag 6)	3.04	10.74*	2.65	2.12	8.18†	2.72
White test (with cross terms)	41.82	37.83	42.49	43.02	37.11	43.45
Lags	1	1	1	1	1	1

1 only Ireland in the group

Source: World Bank and Eurostat. Authors' calculation.

** p - value < 0.01 * p - value < 0.05 † p - value < 0.1. Standard errors in parentheses. Three control variables are real GDP, unemployment rate, and industry share in GDP. Error correction term shows the speed to long run adjustment, and the Wald coefficient shows the significance of a short run relationship.

Table A1.3
Results of the VECM for the Central European states

	M1	M2	M3	M4	M5	M6
	Dependent variable					
	Gini	Lowest 20	Fourth 20	Third 20	Second 20	Highest 20
Constant	0.11 (0.07)	-0.13† (0.07)	0.06* (0.03)	-0.04† (0.02)	-0.07 (0.05)	0.07† (0.04)
Error correction term	-0.14 (0.09)	-0.16† (0.08)	-0.20† (0.11)	-0.16† (0.09)	-0.07 (0.08)	-0.18† (0.10)
Wald coefficient test (χ^2)	0.77	0.11	1.28	2.15	0.50	0.82
GDP	-0.00 (0.01)	0.00 (0.01)	-0.01* (0.00)	0.00 (0.00)	0.00 (0.00)	-0.00 (0.00)
Unemployment rate	-0.02 (0.01)	0.01 (0.01)	0.00 (0.01)	0.01 (0.01)	0.01 (0.01)	-0.01 (0.01)
Industry	-0.03† (0.01)	0.02† (0.01)	0.01 (0.01)	0.01 (0.01)	0.01 (0.01)	-0.02† (0.01)
R2	0.13	0.12	0.30	0.15	0.11	0.15
Adjusted R2	0.05	0.03	0.19	0.07	0.02	0.06
Standard error of the regression	0.03	0.03	0.01	0.01	0.02	0.02
Log-likelihood	148.20	148.73	194.15	202.05	175.00	174.86
Akaike AIC	-4.15	-4.17	-6.17	-5.74	-4.94	-4.94
Durbin Watson	2.15	2.04	2.07	2.26	2.29	2.17
Number of observations	70	70	62	70	70	70
Autocorrelation LM test (at lag 6)	3.49	3.48	3.89	0.87	4.27	2.04
White test (with cross terms)	90.64	86.87	140.94	89.10	98.36†	96.41
Lags	1	1	2	1	1	1

Source: World Bank and Eurostat. Authors' calculation.

** p - value < 0.01 * p - value < 0.05 † p - value < 0.1. Standard errors in parentheses. Three control variables are real GDP, unemployment rate, and industry share in GDP. The error correction term shows the speed of long-run adjustment, and the Wald coefficient shows the significance of a short-run relationship.

Table A1.4
Results of the VECM for the Eastern European states

	M1	M2	M3	M4	M5	M6
	Dependent variable					
	Gini	Lowest 20	Fourth 20	Third 20	Second 20	Highest 20
Constant	-0.05 (0.10)	0.09 (0.12)	-0.07* (0.03)	0.04 (0.03)	0.05 (0.05)	-0.03 (0.06)
Error correction term	0.01 (0.01)	-0.00 (0.01)	-0.19** (0.05)	-0.01 (0.03)	0.01 (0.01)	0.01 (0.02)
Wald coefficient test (χ^2)	9.71*	3.37	2.96	4.27	7.82*	10.11*
GDP	-0.01 (0.01)	0.00 (0.01)	0.01** (0.00)	-0.00 (0.00)	0.01 (0.00)	-0.00 (0.01)
Unemployment rate	0.02 (0.01)	-0.03* (0.01)	0.00 (0.00)	0.00 (0.00)	-0.01† (0.01)	0.01 (0.01)
Industry	0.03 (0.03)	-0.02 (0.03)	-0.01 (0.01)	-0.01 (0.01)	-0.03* (0.01)	0.02 (0.02)
R2	0.24	0.12	0.39	0.26	0.28	0.28
Adjusted R2	0.12	-0.02	0.29	0.14	0.16	0.16
Standard error of the regression	0.03	0.04	0.01	0.01	0.02	0.02
Log-likelihood	159.57	148.73	248.78	231.32	205.65	198.64
Akaïke AIC	-4.02	-3.72	-6.43	-5.96	-5.26	-5.07
Durbin Watson	1.96	1.97	1.75	1.97	2.06	1.96
Number of observations	76	76	76	76	76	76
Autocorrelation LM test (at lag 6)	3.25	5.15	10.37*	1.47	2.79	1.12
White test (with cross terms)	205.32	209.19	193.06	200.32	209.86	207.02
Lags	3	3	3	3	3	3

Source: World Bank and Eurostat. Authors' calculation.

** p - value < 0.01 * p - value < 0.05 † p - value < 0.1. Standard errors in parentheses. Three control variables are real GDP, unemployment rate, and industry share in GDP. The error correction term shows the speed of long-run adjustment; the Wald coefficient shows the significance of a short-run relationship.

Table A1.5
Results of the VECM for the Mediterranean states

	M1	M2	M3	M4	M5	M6
	Dependent variable					
	Gini	Lowest 20	Fourth 20	Third 20	Second 20	Highest 20
Constant	-0.42** (0.14)	0.60** (0.15)	0.02 (0.02)	0.20** (0.07)	0.34** (0.11)	-0.26** (0.09)
Error correction term	-0.17** (0.06)	-0.48** (0.11)	-0.18** (0.06)	-0.15** (0.05)	-0.21** (0.06)	-0.15** (0.05)
Wald coefficient test (χ^2)	0.28	0.76	0.15	0.02	0.61	0.27
GDP	0.03** (0.01)	-0.03** (0.01)	-0.00† (0.00)	-0.02** (0.01)	-0.03** (0.01)	0.02** (0.01)
Unemployment rate	0.02† (0.01)	-0.06** (0.02)	0.01 (0.00)	-0.00 (0.01)	-0.02* (0.01)	0.01 (0.01)
Industry	-0.00 (0.01)	-0.02 (0.02)	0.01 (0.01)	-0.00 (0.01)	-0.00 (0.01)	-0.00 (0.01)
R2	0.23	0.41	0.19	0.18	0.21	0.20
Adjusted R2	0.14	0.30	0.09	0.08	0.12	0.10
Standard error of the regression	0.02	0.03	0.01	0.02	0.02	0.02
Log-likelihood	136.59	112.90	178.88	162.95	150.59	157.43
Akaïke AIC	-4.47	-4.00	-5.93	-5.38	-4.95	-5.19
Durbin Watson	1.98	1.84	2.23	2.19	2.05	2.06
Number of observations	60	53	60	60	60	60
Autocorrelation LM test (at lag 6)	7.12	4.15	4.62	3.81	3.41	5.97
White test (with cross terms)	87.22	134.42	82.47	84.34	83.03	89.57
Lags	1	2	1	1	1	1

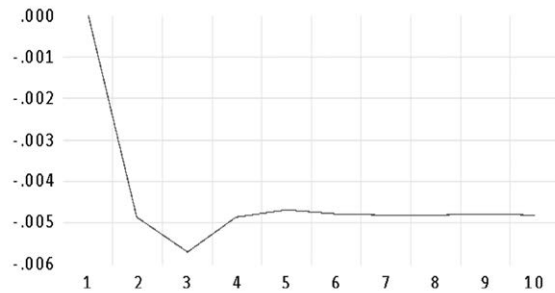
Source: World Bank and Eurostat. Authors' calculation.

** p - value < 0.01 * p - value < 0.05 † p - value < 0.1. Standard errors in parentheses. Three control variables are real GDP, unemployment rate, and industry share in GDP. The error correction term shows the speed of long-run adjustment, and the Wald coefficient shows the significance of a short-run relationship.

Appendix 2

Figure A2.1

Impulse response function of lowest income share groups to innovation in international tourist receipts: Nordic cluster

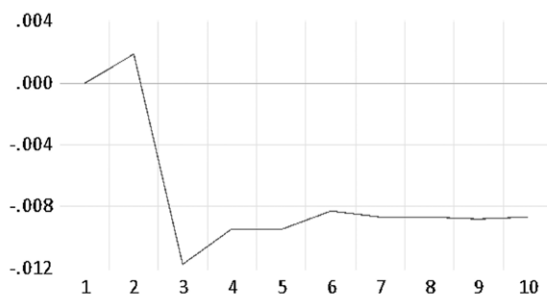


Shock in Cholesky one standard deviation (d.f. adjusted).

Source: World Bank and Eurostat. Authors' representation.

Figure A2.2

Impulse response function of lowest income share groups to innovation in international tourist receipts: Anglo-Saxon cluster

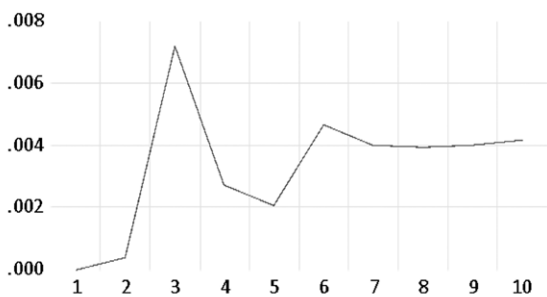


Shock in Cholesky one standard deviation (d.f. adjusted).

Source: World Bank and Eurostat. Authors' representation.

Figure A2.3

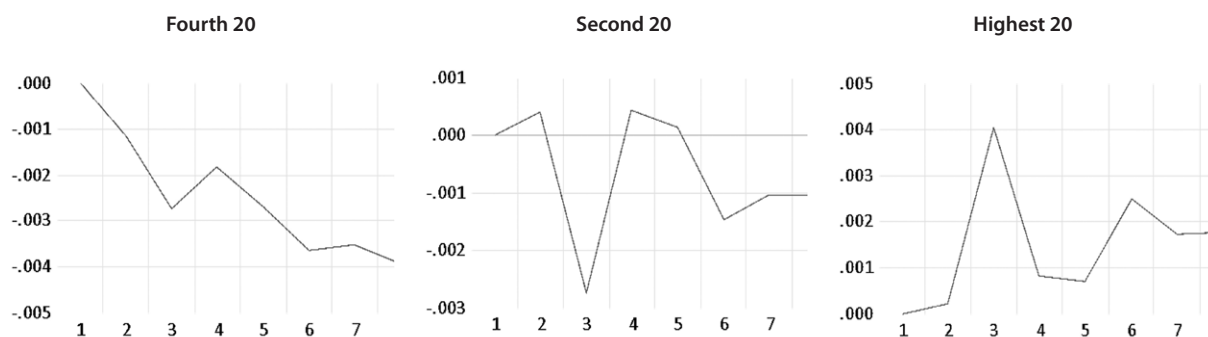
The impulse response function of Gini to innovation in international tourist receipts: Eastern European cluster



Shock in Cholesky one standard deviation (d.f. adjusted).

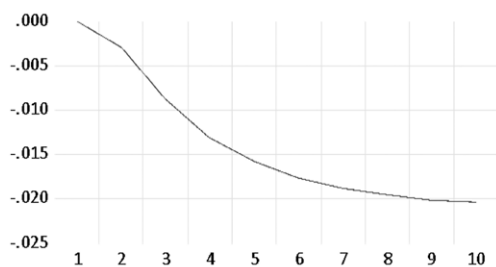
Source: World Bank and Eurostat. Authors' representation.

Figure A2.4
 Impulse response function of quintile income share groups to innovation in international tourist receipts:
 Eastern European cluster



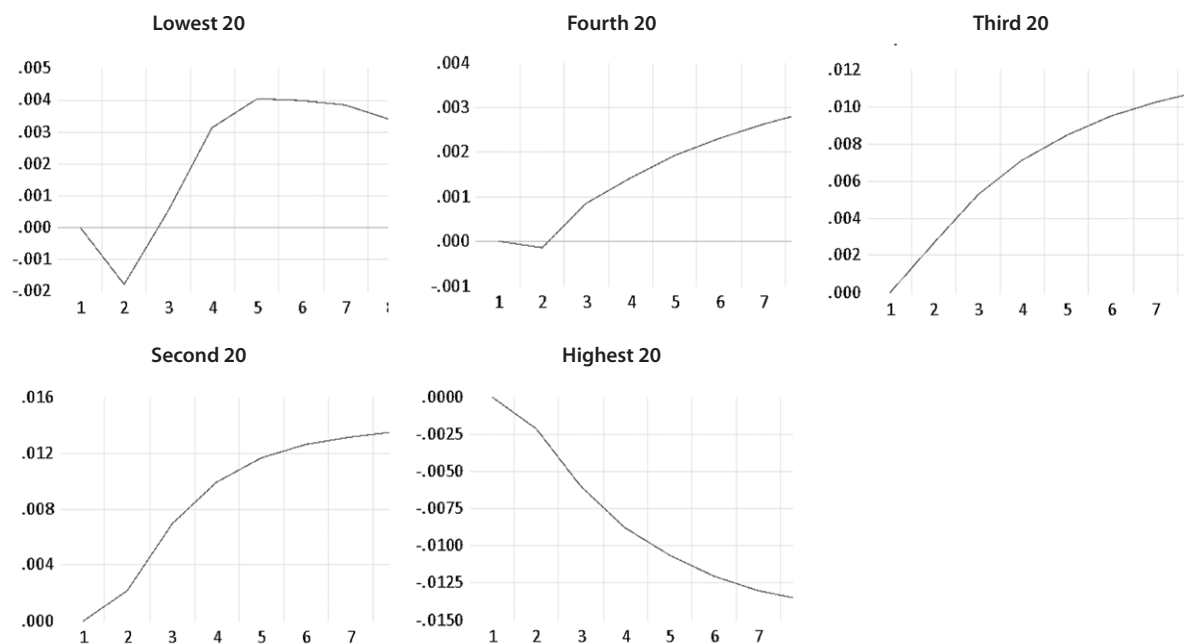
Shock in Cholesky one standard deviation (d.f. adjusted).
 Source: World Bank and Eurostat. Authors' representation.

Figure A2.5
 Impulse response function of Gini to innovation in international tourist receipts: Mediterranean cluster



Shock in Cholesky one standard deviation (d.f. adjusted).
 Source: World Bank and Eurostat. Authors' representation.

Figure A2.6
 The impulse response function of quintile income shares groups to innovation in international tourist receipts:
 Eastern European cluster



Shock in Cholesky one standard deviation (d.f. adjusted).
 Source: World Bank and Eurostat. Authors' representation.