

Competitiveness of European Nations II

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This companion paper extends the Knowledge-Energy Index (KEI) analysis from Paper I by examining the economic structures of 11 European countries across five KEI performance groups. It organizes Eurostat and related economic data into a common framework covering macroeconomic conditions, integration history, migration, trade, public and private activity, strategic assets, investment, household welfare, and major industries. Selected indicators are normalized relative to Denmark and compared with KEI. The analysis finds reasonable positive relationships between KEI and GDP per capita, average annual compensation, and personal consumption expenditure, while total exports per capita and several rate-based indicators show weaker or less consistent relationships. The paper emphasizes that KEI is a compact indicator and should be interpreted alongside broader quantitative and qualitative evidence on national economic structure.

Keywords: Competitiveness, European economies, Knowledge-Energy Index, Eurostat, economic structure, productivity, trade, investment

Introduction

This paper does not offer a comprehensive evaluation of national economies. It examines how KEI relates to established economic indicators and explores whether differences in national economic structure help explain the five KEI performance groups identified in Paper I (Safwat 2025).

The companion study, Competitiveness of European Nations I: Human Capital, Intellectual Capital, and Energy, estimates KEI using average hourly wages and household electricity prices. Paper II selects 11 countries across the five KEI groups and examines their broader economic characteristics within a common data framework. The study focuses on these 11 countries, selected to represent the five KEI groups of Paper I (Please refer to Table 1). Economic and related data are standardized to facilitate comparison. Because the selected countries differ substantially in scale, structure, and statistical coverage, the analysis is indicative rather than a comprehensive assessment of national competitiveness.

The analytical framework covers A1-A9 macroeconomic and supporting indicators, B1-B2 indicators for major industries and productivity, and notes on data sources and confidence.

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Table 1. *Selected Countries by KEI Group and Rank*

KEI Group	#	Country	KEI Group	#	Country
Group 5	1	Norway	Group 2	14	Spain
Group 5	2	Switzerland	Group 2	16	Malta
Group 5	3	The Netherlands	Group 1	22	Croatia
Group 4	5	Denmark	Group 1	24	Poland
Group 3	9	Germany	Group 1	28	Greece
Group 3	11	Finland			

Country workbooks were prepared primarily from 2024 Eurostat data and complementary authoritative sources. Tables 2-6 present an illustrative country profile for Denmark. Denmark was also selected as the normalization reference, and Appendices A and B consolidate the corresponding indicators for the 11 selected countries.

Section 2 presents the country selection and an illustrative profile of Denmark. Sections 3 and 4 review the supporting indicators A2-A9 and B1-B2, respectively. Section 5 discusses data collection and quality control. Section 6 compares selected normalized indicators with KEI, and Section 7 presents the conclusions.

Competitiveness of the 11 Selected Nations

A1 brings together key indicators that offer a high-level snapshot of each national economy. Some indicators also appear in the supporting A2-A9 framework (Appendix A), creating limited but intentional overlap.

Denmark Illustrative Country Profile

Denmark exemplifies the common country-profile structure used in this study (Statistics Denmark n.d.). Tables 2-6 present country-level indicators, external trade and economic structure, capital and household measures, industry-level indicators, and a concise country summary. Values marked with approximation signs are indicative and should be read alongside the source and data-quality notes.

Table 2. *Denmark Country Overview, European Integration, and Migration Indicators, 2024**A1 Country Overview*

Indicator	Denmark 2024
Population	5.96 million
Employment rate, ages 20-64	81.5%
Estimated employment	approximately 3.1 million
GDP	approximately EUR 406 billion
GDP growth	approximately 3.6%
GDP per capita	approximately EUR 68,000
Inflation, HICP	approximately 1.9%
Unemployment	approximately 5-6%
Government debt as a share of GDP	approximately 31%
Budget balance as a share of GDP	approximately +3% to +4%

A2 European Integration

Indicator	Denmark
EU membership	1973
Euro area membership	No
Currency	Danish krone (DKK)
Schengen membership	2001

Denmark is an EU member with an opt-out from adopting the euro and participates fully in the Schengen Area.

A3 Immigration Emigration and Remittances

Indicator	Value
Foreign-born population	approximately 900,000
Share of population	approximately 15%
Estimated immigrant workforce	approximately 500,000-600,000
Estimated GDP contribution	EUR 40-60 billion
Estimated GDP contribution share	approximately 10-15%
Danish citizens abroad	approximately 250,000-300,000
Remittances received	Small
Remittances as a share of GDP	less than 0.2%

Note: Migration and GDP-contribution estimates are indicative and definition-sensitive. Immigration supports labour-force growth and helps offset demographic ageing.

Table 3. *Denmark External Trade, Public and Private Economy, and Strategic Assets, 2024**A4 External Trade*

Indicator	Value
Goods exports	approximately EUR 135 billion
Services exports	approximately EUR 95 billion
Total exports	approximately EUR 230 billion
Goods imports	approximately EUR 120 billion
Services imports	approximately EUR 70 billion
Total imports	approximately EUR 190 billion
Trade balance	approximately EUR 40 billion surplus
Exports as a share of GDP	approximately 57%
Main export categories	Pharmaceuticals; shipping services; machinery and equipment; food products; wind-energy equipment

A5 Public and Private Economy

Indicator	Public	Private
Employment	approximately 1.0-1.05 million	approximately 2.2-2.3 million
Employment share	approximately 31-32%	approximately 68-69%
GVA contribution	approximately EUR 68-72 billion	approximately EUR 285-300 billion
Share of GVA	approximately 19-20%	approximately 80-81%

Note: Denmark's welfare state is supported by a highly productive private sector that generates roughly four-fifths of national value added.

A6 Strategic National Assets and Resource Base

Indicator	Denmark
Dominant natural resources	Limited
Sovereign wealth fund	No significant fund
Strategic advantages	Pharmaceuticals; shipping; wind technology
Major global positions	Insulin; biotechnology; offshore shipping
Economic model	High-productivity diversified economy

Table 4. *Denmark Capital Formation, Productive Assets, and Household Welfare, 2024**A7 Capital Formation and Investment Flow*

Indicator	Denmark 2024
Gross fixed capital formation	approximately EUR 90-95 billion
GFCF as a share of GDP	approximately 22-23%
Public investment	approximately EUR 15-18 billion
Private investment	approximately EUR 75-78 billion
Public investment as a share of GDP	approximately 4%
Private investment as a share of GDP	approximately 18-19%
Investment growth	Positive

Note: National accounts provide the appropriate statistical framework for GDP, consumption, government finance, investment, trade, employment, wages, profits, and industry productivity.

A8 Capital Stock and Productive Assets

Indicator	Denmark
Estimated capital stock	approximately EUR 1.5-2.0 trillion
Capital stock to GDP ratio	approximately 4-5 times GDP
Public capital stock	Significant
Private capital stock	Dominant
Infrastructure quality	Very high
Industrial capital quality	Very high
Digital infrastructure	Very high

Note: Capital-stock values are indicative because they are more model-dependent than annual GDP, employment, or trade statistics.

A9 Household Welfare and Financial Position

Indicator	Denmark 2024
GDP per capita	approximately EUR 66,000-68,000
PCE or HFCE per capita	approximately EUR 33,000-35,000
Average compensation per employee	approximately EUR 65,000-70,000
Household saving rate	approximately 8-10% of disposable income
Household electricity price, 1,000-2,500 kWh/year	approximately EUR 0.37-0.38/kWh
Electricity affordability	High
Broadband and digital inclusion	Very high

Note: Household saving follows the disposable-income concept. Electricity prices refer to the stated household-consumption band and include taxes and levies.

Table 5. *Denmark Major Industries, Productivity Indicators, and Economic Drivers, 2024**B1 Major Private Sector Industries*

NACE	Industry	GVA EUR billion	Growth trend
C	Manufacturing	70-78	Strong
G	Wholesale and retail trade	35-40	Moderate
H	Transport and storage	25-32	Moderate
J	Information and communication	20-24	Strong
K	Financial and insurance	17-21	Positive
M	Professional scientific and technical	25-31	Positive
F	Construction	20-24	Moderate
L	Real estate activities	35-42	Stable
A	Agriculture forestry and fishing	5-7	Variable
N	Administrative and support services	12-16	Moderate

B2 Productivity Indicators

Industry	GVA per employee EUR	Compensation per employee EUR
Manufacturing	200,000-220,000	78,000-85,000
Finance and insurance	220,000-250,000	90,000-105,000
ICT	150,000-175,000	85,000-95,000
Transport and logistics	160,000-190,000	65,000-75,000
Professional services	120,000-145,000	70,000-80,000
Construction	105,000-125,000	60,000-70,000
Wholesale and retail	80,000-95,000	50,000-58,000
Agriculture	80,000-105,000	35,000-45,000

B3 Key Economic Drivers

High-productivity industries	Representative companies
Pharmaceuticals	Novo Nordisk
Biotechnology	ALK-Abello and other biotechnology firms
Shipping and logistics	A.P. Moller-Maersk
ICT and software	Representative national firms
Financial services	Representative national firms
Engineering services	Danfoss
Wind-energy equipment	Vestas
Advanced food products	Arla Foods

Table 6. Denmark Executive Summary and Core Data Sources

Executive summary
High labour-force participation
Strong export orientation
Private-sector generation of approximately 80% of value added
Concentration in high-productivity industries rather than tourism
Significant contributions from pharmaceuticals, shipping, engineering, ICT, finance, and advanced food processing
A large but fiscally sustainable welfare state supported by high private-sector productivity

Core Data Sources

Source	Relevant dataset or publication
Eurostat	Population on 1 January (demo_pjan)
Eurostat	GDP and main aggregates (nama_10_gdp)
Eurostat	National accounts by industry, NACE Rev. 2 (nama_10_a64)
Eurostat	Employment by industry, NACE Rev. 2 (nama_10_a64_e)
Eurostat	International trade in goods and services statistics
Statistics Denmark	National accounts by industry
OECD	OECD Economic Surveys: Denmark

Source: Author's compilation from the sources listed above. Approximate values should be verified against the final appendix workbooks before submission.

Denmark was selected to demonstrate the country-profile structure and to provide the normalization reference used in Section 6. As a Group 4 country, it represents a relatively high-KEI economy while maintaining an economic structure that can be meaningfully compared with the other selected countries.

Comparative Review of A1-A9 Indicators

For the 11 countries in Appendices A and B, as shown in Table 1, the countries are grouped as follows: Group 1 appears first, then Group 2 (two countries: Spain and Malta), Group 3 (two countries: Germany and France), Group 4 (one country: Denmark), and lastly Group 5 (three countries: The Netherlands, Switzerland, and Norway). This order reflects the increasing strengths predicted by KEI for the groups in Paper I.

A1 Comparative Economic Overview (2024)

- includes major economic indicators for the 11 countries.

A2 European and Economic Integration History

These indicators capture two aspects of European integration: accession to the European Union and adoption of the euro. The timelines are important because several Eastern European economies underwent prolonged institutional and economic transitions before achieving full integration.

A3 Immigration, Emigration, and Remittances

Foreign-born residents make important contributions to host-country output. Across the selected countries, their share of the population varies widely. Their contribution to GDP is generally larger than their population share because migrants are concentrated in working-age groups, though estimates should be interpreted cautiously because definitions and methods differ.

Europe's aging population helps explain immigration's growing economic importance in many countries. Immigration policy therefore reflects both economic demand and recurring political debate. Remittance outflows are more visible for some lower-KEI countries and comparatively small for several higher-KEI countries in the selected sample.

A4 External Trade

All 11 countries export substantial amounts, though exports account for widely varying shares of GDP. In several economies, exports make up roughly half of GDP or more. Small, open economies can exceed 100% because gross trade includes imported intermediate inputs and re-exports.

Services account for a significant share of exports, with particularly high values in economies that specialize in logistics, finance, tourism, information services, and other tradable services.

The imports-to-exports ratio also varies by group and reflects openness, domestic production capacity, supply-chain integration, and reliance on imported inputs.

The industries that drive each economy are identified in A4.9 and examined further in the B1-B2 industry and productivity comparisons. High-value activities—such as advanced machinery, pharmaceuticals, precision goods, digital services, and logistics—typically contribute more to productivity than lower-value activities.

A5 Public and Private Economy

The selected countries have broadly similar distributions of public- and private-sector employment, although the exact shares differ. GDP and employment shares are not interchangeable, since productivity varies by sector.

A6 Strategic Assets and Resource Base

A6 is primarily qualitative. It captures dominant natural resources, strategic advantages, areas of international leadership, and characteristic economic models. Although these factors are difficult to reduce to a single numeric indicator, they can significantly influence competitiveness, advantages, areas of international leadership, and characteristic economic models. These factors cannot be easily reduced to a single numeric indicator, yet they can significantly influence competitiveness.

A7 Capital Formation and Investment Flows

Gross investment typically makes up a substantial share of GDP in the selected countries. Its public and private components differ, and persistently lower investment ratios may limit future productive capacity.

A8 Capital Stock and Productive Assets

Estimated capital-stock-to-GDP ratios are generally high, yet important qualitative differences remain in infrastructure, industrial assets, public capital, and digital systems. Capital quantity alone does not reflect quality or economic effectiveness. These dimensions complement numerical capital-stock indicators and help explain differences in national productive capacity.

A9 Household Welfare and Financial Position

This group examines how national economic performance affects household welfare, consumption, saving, and financial resilience. Household saving rates differ across countries and KEI groups, potentially reflecting differences in income, taxation, pension systems, housing costs, demographics, and reference years. Isolated values should therefore be verified carefully.

The ratio of per capita personal consumption expenditure to per capita GDP offers another perspective on how output is allocated among household consumption, government activity, investment, and net exports. Appendix A compares A1-A9 across the 11 selected countries using 2024 data.

Supporting Information: B1-B2

The B1-B2 framework focuses on major private-sector industries and compares industry-level measures of output, employment, compensation, and productivity across the selected countries.

B1 Major Private-Sector Industries

Within a given industry, compensation per unit of gross value added varies less than national averages might imply, perhaps reflecting competitive pressures and

the integration of labor and product markets across countries.

B2 Productivity Indicators

Productivity is central to competitiveness; therefore, the B2 indicators compare industry-level gross value added and compensation per employee across the selected countries. Appendix B provides comparative B1-B2 industry information for the 11 selected countries using 2024 data.

Obtaining Data from Eurostat

The systematic data-collection process was more challenging than expected. Key difficulties included finding comparable Eurostat series, aligning definitions and reference periods across countries, tracking provisional revisions, and automating extraction while preserving the source context.

- a) Eurostat is comprehensive and well organized, but new users may find its multidimensional datasets difficult to navigate when comparing multiple factors across countries. Using ChatGPT to automate parts of the search required extensive verification and did not consistently reduce extraction time. Confirming that each extracted series matched the intended population, unit, and statistical definition required several parallel checks.
- b) The appendix data show that some provisional values were fairly close to later releases, but revisions still affect reproducibility. Each observation should therefore include its source release, extraction date, unit, and status.
- c) Automated quality checks became too complex to replace direct review of source metadata.
- d) Several quality-control approaches were tried; unresolved differences were retained as limitations rather than forced into false precision.

Despite these limitations, the Appendix A & B framework provides a usable comparative dataset and supports cautious, indicative findings.

Analysis of Appendix A Data

Safwat (2025) reported a positive relationship between KEI and personal consumption expenditure per person using United States data. The present study therefore examines how the KEI values developed in Paper I relate to selected economic indicators for the 11 European countries in 2024.

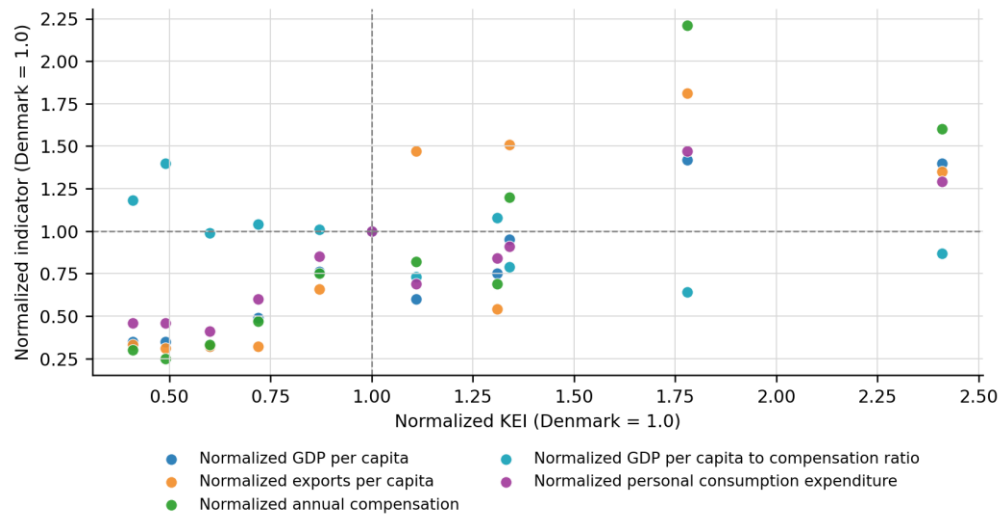
Primary Analysis: Tab A1

Appendix A contains the comparative indicators. For the principal analysis, selected A1 variables were normalized to Denmark, which was assigned a reference

value of 1.0. The resulting values were compared with normalized KEI for the 11 countries in 2024.

Figure 1 presents the five normalized economic indicators together, with normalized KEI on the horizontal axis. Figures 2-6 then examine each relationship separately. Ordinary least-squares trend lines are shown for descriptive purposes only.

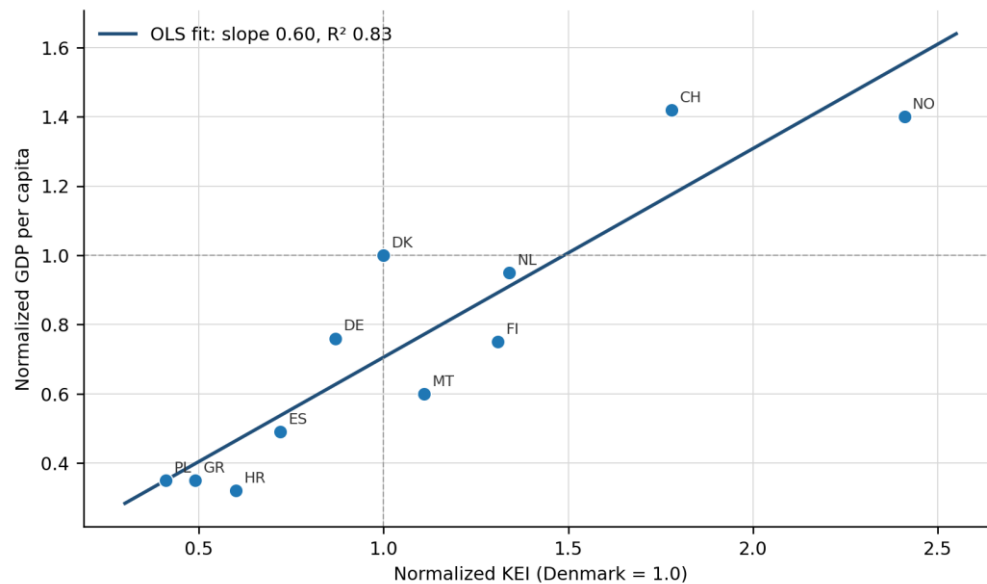
Figure 1. Five Normalized Economic Indicators Plotted Against Normalized KEI



Source: Author's calculations from the normalized values reported in Appendix A.

The relationships shown together in Figure 1 are examined separately in Figures 2-6.

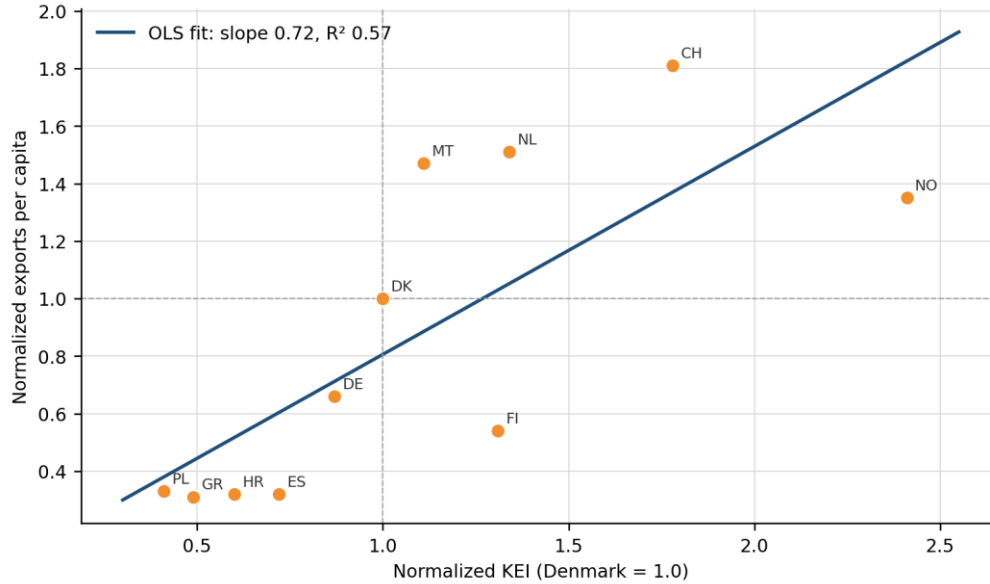
Figure 2. Normalized GDP Per Capita Plotted Against Normalized KEI



Source: Author's calculations from the normalized values reported in Appendix A.

Figure 2 shows a strong positive descriptive relationship between normalized GDP per capita and normalized KEI (R^2 approximately 0.83).

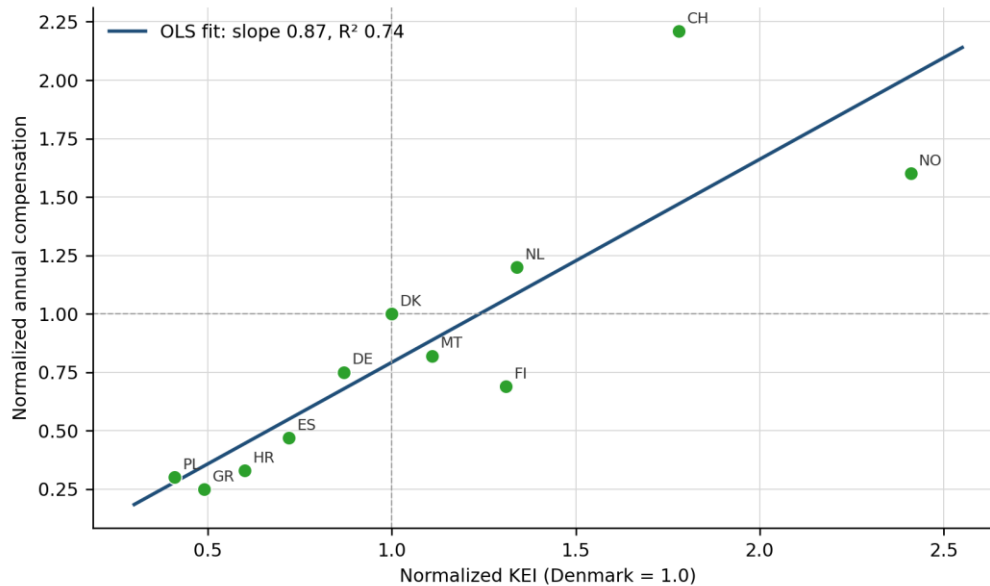
Figure 3. *Normalized Exports Per Capita Plotted Against Normalized KEI*



Source: Author's calculations from the normalized values reported in Appendix A.

Figure 3 shows a positive but more dispersed relationship between normalized exports per capita and normalized KEI (R^2 approximately 0.57). The result is sensitive to the structure of small, highly open economies.

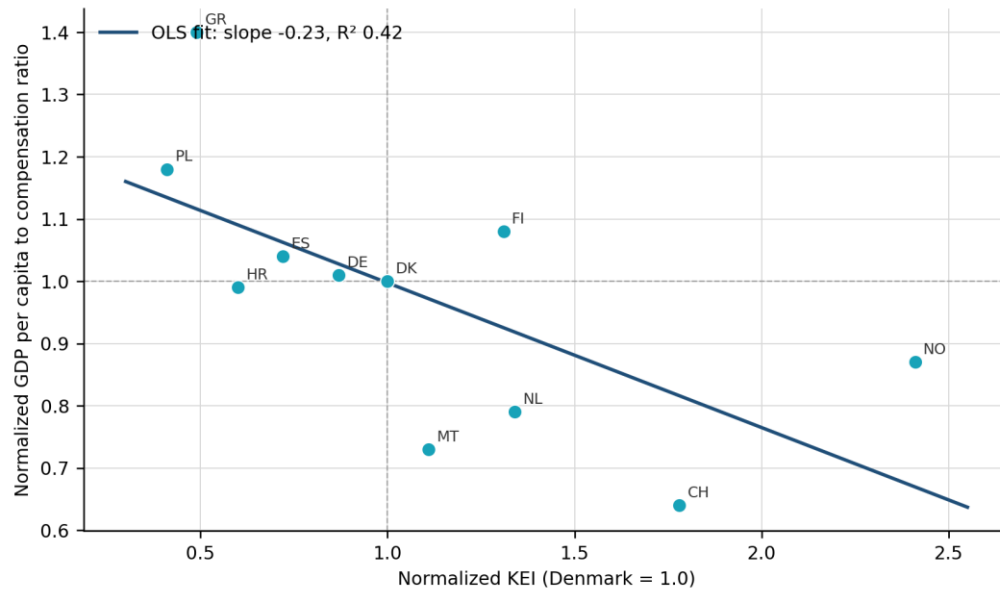
Figure 4. *Normalized Annual Compensation Plotted Against Normalized KEI*



Source: Author's calculations from the normalized values reported in Appendix A.

Figure 4 shows a strong positive descriptive relationship between normalized annual compensation and normalized KEI (R^2 approximately 0.74).

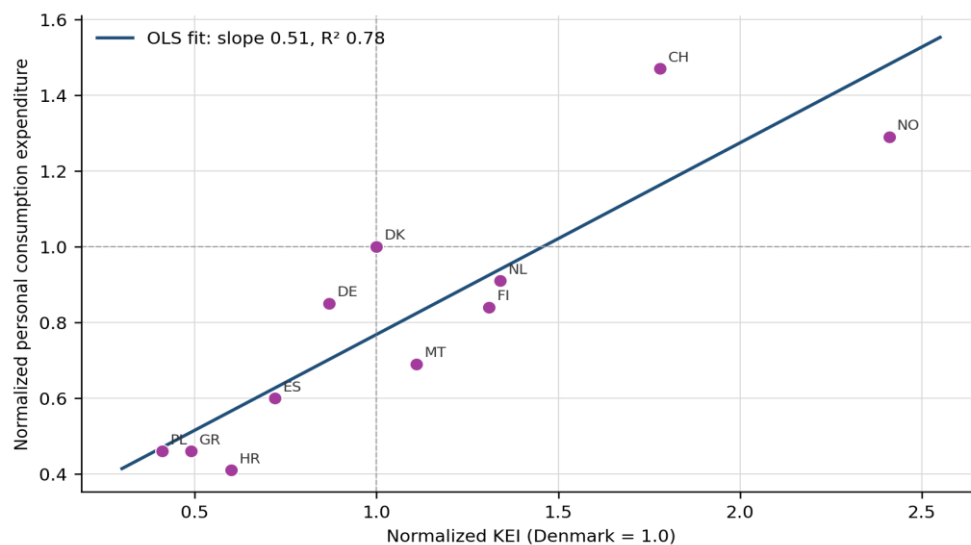
Figure 5. *GDP Per Capita/Compensation (Both Normalized,) Plotted Against Normalized KEI*



Source: Author's calculations from the normalized values reported in Appendix A.

Figure 5 shows a moderate inverse relationship between the normalized GDP-per-capita-to-compensation ratio and normalized KEI (R^2 approximately 0.42). This ratio should be interpreted cautiously because both numerator and denominator reflect several structural factors.

Figure 6. *Normalized Personal Consumption Expenditure Plotted Against Normalized KEI*



Source: Author's calculations from the normalized values reported in Appendix A.

Figure 6 shows a strong positive descriptive relationship between normalized personal consumption expenditure and normalized KEI, with an R^2 of approximately 0.78. In this small cross-sectional sample, the rate-based A1 indicators—inflation, unemployment, government debt as a share of GDP, and budget balance as a share of GDP—did not show sufficiently clear relationships with KEI.

The descriptive regressions show positive relationships for normalized GDP per capita, annual compensation, and personal consumption expenditure (Figures 2, 4, and 6). Exports per capita show a weaker, more dispersed positive relationship, whereas the GDP-per-capita-to-compensation ratio shows a moderate inverse relationship.

Based on the tabulated normalized values, the ordinary least-squares slopes are approximately 0.60 for GDP per capita, 0.72 for exports per capita, 0.87 for annual compensation, -0.23 for the GDP-per-capita-to-compensation ratio, and 0.51 for personal consumption expenditure. The corresponding R^2 values are approximately 0.83, 0.57, 0.74, 0.42, and 0.78. With only 11 observations, these results are descriptive and should not be interpreted as causal estimates.

Commentary on the Remaining A and B Indicators

The A2-A9 and B1-B2 indicators add valuable context and highlight the complexity of comparing national economies. Several lower-level indicators shape the high-level relationships examined in A1, and many are qualitative or non-numerical. Rather than weakening the analysis, they reveal structural characteristics that a single ratio cannot adequately capture and complement KEI.

Conclusions

This paper aimed to synthesize commonly used economic indicators into an overall assessment of national competitiveness and compare the results with KEI. Although the author compiled comprehensive data and information from different countries, the databases in Appendices A and B could not, on their own, yield a conclusive result. The complex overlap among the many factors makes it difficult to determine their relative weights. Nevertheless, the data in Appendices A and B help clarify the effects of various factors. Section 6 examined the relationships shown in Figures 2, 4, and 6, providing preliminary support for further analysis of KEI alongside GDP per capita and household consumption.

Using qualitative indicators acknowledges that not every aspect of competitiveness can be quantified. Established frameworks such as GKI, EIS, and IMD face similar challenges and address them by selecting and weighting indicators. KEI should therefore be seen as a transparent, complementary measure, not a comprehensive ranking system.

Future KEI updates would benefit from timely, harmonized Eurostat data on annual employee compensation, working hours, and household electricity prices, along with clear documentation of provisional figures and subsequent revisions. The study also highlights the limitations of automated data extraction: AI can help identify and organize information, but experts must still review source selection, metadata interpretation, unit consistency, and revision control.

Acknowledgments

The author dedicates this work to the late Professor Ibrahim Oweiss of Georgetown University, who passed away in November 2023. Professor Oweiss collaborated with the author starting in 1988 and made significant contributions to the author's earlier work on knowledge and energy. The author gratefully acknowledges Eurostat as the primary source of the data used in this paper. The author remains responsible for the selection, interpretation, and presentation of the information.

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¹Because this paper is closely related to Paper I, the references below emphasize sources used specifically for Paper II. Appendices A and B provide the detailed comparative tables and source notes.

Appendix A. Comparative Tables for the 11 Selected Countries in 2024

European Commission (2024), Eurostat (n.d.) *Eurostat Database*, ILO (2025), IMF (2025), McKinsey Global Institute (2025), OECD (2024), OECD (2025), United Nations Conference on Trade and Development (2025), United Nations Statistics Division (2025), World Bank (2025), WTO (2025)

Country abbreviations: PL Poland; GR Greece; HR Croatia; ES Spain; MT Malta; DE Germany; FI Finland; DK Denmark; NL Netherlands; CH Switzerland; NO Norway.

Source basis: author's comparative work; United Nations Development Program (2025) United Nations Development Program (2025) book, compiled principally from Eurostat and complementary authoritative sources. Indicative or model-dependent items should be interpreted with the paper's data-quality qualifications.

Table A1. Comparative Economic Overview (2024), Part I

Parameter	Code	PL	GR	HR	ES	MT	DE	FI	DK	NL	CH	NO
A1.1 Demographic Base												
Population, total (million persons)	A1.1.1	36.6	10.4	3.9	48.6	0.574	84.7	5.6	6	18	8.9	5.5
Employment, economy-wide (million persons)	A1.1.2	17.5	4.3	1.8	22	0.325	46	2.6	3.1	9.8	5.3	2.9
Employment / total population (%) — derived	A1.1.3	47.8	41.3	46.5	45.3	56.6	54.3	47.3	52	54.4	59.2	52.3
Employment rate, age 20–64 (%) — LFS	A1.1.4	78.4	69.5	73.6	71.5	82.5	81	78.5	81	83.5	84.5	82.5
A1.2 Economic Output												
GDP, current prices (€ billion)	A1.2.1	860	245	84	1,590	23.1	4,300	280	400	1,150	850	520
Real GDP growth (%)	A1.2.2	2.9	2.3	3.7	3.3	7	0	0.4	3.6	0.9	1.3	1.7
GDP per capita (€) — derived	A1.2.3	23,497	23,558	21,705	32,716	40,221	50,767	50,000	67,114	63,889	94,972	93,694
GDP per employed person (€) — derived	A1.2.4	49,143	56,977	46,667	72,273	71,068	93,478	105,660	129,032	117,347	160,377	179,310
A1.3 Trade												
Total exports, goods + services (€ billion)	A1.3.1	460	125	48	595	32.5	2,150	116	230	1,050	625	290
Total imports, goods + services (€ billion)	A1.3.2	410	120	52	530	29	1,900	116	190	880	495	175
Trade balance (€ billion) — derived	A1.3.3	50	5	–4	65	3.5	250	0	40	170	130	115
Exports / GDP (%) — derived	A1.3.4	53.5	51	57.1	37.4	140.7	50	41.4	57.5	91.3	73.5	55.8

Table A1. Comparative Economic Overview (2024), Part 2

Parameter	Code	PL	GR	HR	ES	MT	DE	FI	DK	NL	CH	NO
A1.4 Human Capital & Knowledge Application												
Average annual full-time-adjusted salary (€)	A1.4.1	21,246	17,954	23,446	33,700	58,600	53,791	49,428	71,565	85,800	158,100	114,320
Average annual hours used in calculation (h)	A1.4.2	2,018	2,070	1,966	1,888	1,945	1,758	1,851	1,706	1,430	1,550	1,429
Average salary per hour (€ / h) — derived	A1.4.3	10.5	8.7	11.9	17.9	30.1	30.6	26.7	42	60	102	80
Annual salary / GDP per employed person (%) — derived	A1.4.4	43.2	31.5	50.2	46.6	82.5	57.5	46.8	55.5	73.1	98.6	63.8
Household electricity price, DC band, incl. taxes (€ / kWh)	A1.4.5	0.228	0.230	0.160	0.245	0.130	0.395	0.220	0.375	0.255	0.300	0.190
Salary-data status	A1.4.6	Eurostat extraction	Eurostat extraction	Eurostat extraction	Eurostat extraction	Eurostat extraction	Eurostat extraction	Eurostat extraction	Eurostat extraction	Provisional comparator	Provisional comparator	Provisional comparator
A1.5 Economic Environment												
Inflation (%)	A1.5.1	3.5	3	4	2.9	2.6	2.4	1.8	1.9	3.2	1.2	3.5
Unemployment (%)	A1.5.2	3	9.5	5.5	11.5	3.2	3.4	8.5	5.5	3.8	2.4	3.8
Government debt / GDP (%)	A1.5.3	50	156	57.6	103	48.5	62.5	82.5	31	44	39	42
Budget balance / GDP (%)	A1.5.4	-5	0	-2.4	-3	-3.4	-2	-4.2	4	-1	0	13

Note: The employment rate for ages 20-64 uses that age group as its denominator and must not be applied to total population. A1 salary measures use the workbook's full-time-adjusted salary basis; A9 uses the separate compensation-per-hour series employed in the KEI calculation.

Salary basis: Poland, Greece, Croatia, Spain, Malta, Germany, Finland, and Denmark use the author's Eurostat nama_10_fle extraction. Netherlands, Switzerland, and Norway remain provisional comparators pending harmonized-source verification.

Table A2. European Integration Indicators (2024)

Parameter	Code	PL	GR	HR	ES	MT	DE	FI	DK	NL	CH	NO
EU membership date	A2.1	1 May 2004	1 Jan 1981	1 Jul 2013	1 Jan 1986	1 May 2004	Founding member (1958 EEC)	1 Jan 1995	1 Jan 1973	Founding member (1958 EEC)	Not an EU member	Not an EU member
Years in EU / EEA by 2024	A2.2	20	43	11	38	20	66	29	51	66	-	30
Eurozone membership	A2.3	No	2001	1 Jan 2023	1999/2002	1 Jan 2008	1999/2002	1999/2002	No	1999/2002	No	No
Currency	A2.4	PLN	EUR	EUR	EUR	EUR	EUR	EUR	DKK	EUR	CHF	NOK
Schengen membership	A2.5	21 Dec 2007	2000	1 Jan 2023	1995	21 Dec 2007	1995	2001	25 Mar 2001	1995	2008	2001
EU budget position	A2.6	Major net recipient	Net recipient	Net recipient	Historically net recipient / near balance	Net recipient	Largest net contributor	Net contributor / near balance	Net contributor	Net contributor	Non-member	Non-member
Integration model / cohort	A2.7	2004 enlargement	Southern enlargement	Post-2004 / Western Balkans	Southern enlargement	2004 enlargement	Founding member	1995 enlargement	First enlargement	Founding member	Bilateral agreements with EU	EEA member

Table A3. Migration Indicators (2024)

Parameter	Code	PL	GR	HR	ES	MT	DE	FI	DK	NL	CH	NO
Foreign-born population (million)	A3.1	1.8	1.2	0.6	8.8	0.18	16.5	0.575	0.9	4.8	2.9	1
Foreign-born share of population (%)	A3.2	4.5	12	15.5	18.5	31.5	19.5	10.5	15	26.5	32	18
Immigrant workforce (million)	A3.3	1	0.6	0.2	4	0.115	7.5	0.3	0.55	2.8	1.9	0.5
Estimated immigrant GDP contribution (€ bn)	A3.4	40	20	7	165	7	600	25	50	215	260	60
Estimated immigrant GDP contribution (%)	A3.5	5	8	8	10.5	30	14	8.5	12.5	19	30	12
Citizens / diaspora abroad (million)	A3.6	4.5	4.5	1.2	3	0.125	4	0.325	0.275	1	0.8	0.35
Remittances received (€ bn)	A3.7	8	2	4	5	0.1	5	1	0.5	1	0.5	0.5
Remittances / GDP (%)	A3.8	1	0.8	5	0.3	0.4	0.1	0.3	0.1	0.1	0.1	0.1

Table A4. Trade Indicators (2024)

Parameter	Code	PL	GR	HR	ES	MT	DE	FI	DK	NL	CH	NO
Goods exports (€ bn)	A4.1	350	52	24	385	4.5	1,650	78	135	750	440	225
Services exports (€ bn)	A4.2	110	70	24	210	28	500	38	95	300	185	65
Total exports (€ bn)	A4.3	460	125	48	595	32.5	2,150	116	230	1,050	625	290
Goods imports (€ bn)	A4.4	340	90	44	425	9	1,450	78	120	670	360	115
Services imports (€ bn)	A4.5	70	28	8	105	20	450	38	70	210	135	55
Total imports (€ bn)	A4.6	410	120	52	530	29	1,900	116	190	880	495	175
Trade balance	A4.7	Surplus	Near balance / small deficit	Goods deficit; services surplus	Overall surplus	Services surplus; goods deficit	Large surplus	Near balance / small deficit	Surplus	Large surplus	Large surplus	Very large surplus
Exports / GDP (%)	A4.8	53	51	57	37.5	140	50	41.5	57	91	73.5	57.5
Main export driver	A4.9	Manufacturing	Tourism & shipping	Tourism services	Tourism & autos	Digital / gaming & tourism	Advanced manufacturing	Machinery, forestry & ICT	Pharma & shipping	Logistics, machinery & services	Pharma, finance & precision goods	Oil, gas & maritime
Total imports / total exports (%)	A4.10	89.1	96	108.3	89.1	89.2	88.4	100	82.6	83.8	79.2	60.3

Table A5. Public-Private Structure (2024)

Parameter	Code	PL	GR	HR	ES	MT	DE	FI	DK	NL	CH	NO
Public employment (million)	A5.1	4.9	1	0.5	4.4	0.08	11.5	0.85	1	2.8	1.2	0.9
Private employment (million)	A5.2	12.6	3.3	1.3	17.8	0.245	34.5	1.8	2.2	7	4.1	2
Public employment share (%)	A5.3	28	23.5	27.5	20	25	25	32	31.5	28.5	23	31
Private employment share (%)	A5.4	72	76.5	72.5	80	75	75	68	68.5	71.5	77	69
Public / quasi-public GVA share (%)	A5.6	21	23	23.5	21	20	21	23.5	19.5	21	19	21
Private / market GVA share (%)	A5.7	79	77	76.5	79	80	79	76.5	80.5	79	81	79

Table A6. Strategic Assets and Economic Model (2024)

Parameter	Code	PL	GR	HR	ES	MT	DE	FI	DK	NL	CH	NO
Dominant natural resources	A6.1	Coal, copper	Minerals, RE resources	Adriatic coast, hydropower	Limited fossil resources	Limited; geographic location	Limited	Forests, minerals	Limited	Declining natural gas	Limited	Oil, gas, hydropower
Strategic advantages	A6.2	Manufacturing platform, skilled labour	Tourism, shipping, geography	Tourism, ports, Adriatic access	Tourism, logistics, renewables	English language, EU/euro access	Industrial base, engineering	Education, engineering, forestry, ICT	Pharma, shipping, wind tech	Logistics, trade, technology	Human capital, finance, innovation	Energy, maritime, fisheries
Global leadership areas	A6.3	Furniture, auto components, appliances	Shipping, tourism	Tourism, niche food/wine	Tourism, infrastructure, renewables	Remote gaming, maritime registry	Machinery, autos, chemicals	Forestry, machinery, clean tech	Insulin, offshore wind, maritime	Semiconductors, logistics, agri-tech	Pharma, finance, precision engineering	Offshore energy, shipping, aquaculture
Economic model	A6.4	Industrial convergence	Services & maritime	Tourism-services convergence	Tourism-services-industrial	Small-island services-export	Advanced industrial	Nordic knowledge-industrial	High-productivity diversified	Trade & logistics	High-value knowledge economy	Resource-rich advanced

Table A7. Investment Flows (2024)

Parameter	Code	PL	GR	HR	ES	MT	DE	FI	DK	NL	CH	NO
GFCF (€ bn)	A7.1	162.5	37.5	21	340	5.5	925	67.5	92.5	270	220	127.5
GFCF / GDP (%)	A7.2	19	16	25.2	21.5	24.5	21.5	24	22.5	23	25	25
Public investment (€ bn)	A7.3	37.5	9	5.5	60	1.1	140	11.5	16.5	37.5	27.5	22.5
Private investment (€ bn)	A7.4	125	28.5	15.5	280	4.3	785	56	76	232.5	192.5	105
Public investment / GDP (%)	A7.5	4.5	3.5	6.5	3.5	5	3.5	4.5	4	3.5	3.5	4.5
Private investment / GDP (%)	A7.6	14.5	11.5	18.5	17.5	19.5	18	19.5	18.5	19.5	21.5	20.5
Investment growth	A7.7	Positive	Positive	Positive	Positive	Positive	Moderate	Weak / mixed	Positive	Moderate positive	Positive	Positive

Table A8. Capital Stock and Infrastructure (2024)

Parameter	Code	PL	GR	HR	ES	MT	DE	FI	DK	NL	CH	NO
Estimated capital stock (€ tn)	A8.1	3	1.1	0.35	7	0.095	20	1.2	1.8	5.5	4.5	2.2
Capital stock / GDP (x)	A8.2	3.5	4.5	4.2	4.5	4.1	4.6	4.5	4.4	4.8	5	4.3
Public capital stock	A8.3	Significant	Significant	Significant	Significant	Significant	Very significant	Significant	Significant	Significant	Significant	Significant
Private capital stock	A8.4	Dominant	Dominant	Dominant	Dominant	Dominant	Dominant	Dominant	Dominant	Dominant	Dominant	Dominant
Infrastructure quality	A8.5	Good-Very good	Good-Very good	Good	Very high	Good / capacity-constrained	Very high	Very high	Very high	Excellent	Excellent	Excellent
Industrial capital quality	A8.6	Good	Moderate	Moderate-good	Good-Very good	Moderate	Very high	High	Very high	Very high	Excellent	Very high
Digital infrastructure	A8.7	Improving	Improving	Improving	High	High	High	Very high	Very high	Excellent	Excellent	Very high

Table A9. Household Welfare and KEI Indicators (2024)

Parameter	Code	PL	GR	HR	ES	MT	DE	FI	DK	NL	CH	NO
GDP per capita (€)	A9.1	23,500	23,500	21,500	33,000	40,500	51,000	50,000	68,000	64,000	95,000	94,000
HFCE / PCE per capita (€)	A9.2	15,600	15,500	14,000	20,500	23,500	29,000	28,500	34,000	31,000	50,000	44,000
Average compensation per hour (€)	A9.3	11.5	13.9	11.9	21.6	17.8	42.2	35.5	46.2	42	65.8	56.3
Household saving rate (%)	A9.4	5	1.5	6.5	8	19.4	10.5	2.5	9	11	19	11
Household savings per capita (€)	A9.5	1,000	250	950	2,150	4,500	3,500	750	3,500	3,500	10,500	6,000
Household electricity price, DC band, incl. taxes (€/kWh)	A9.6	0.228	0.230	0.160	0.245	0.130	0.395	0.220	0.375	0.255	0.300	0.190
KEI	A9.7	50	60	74	88	137	107	161	123	165	219	296
Broadband / digital inclusion	A9.8	High & improving	Improving	Improving	High	High	High	Very high	Very high	Very high	Very high	Very high

Appendix B. Comparative Industry Tables 2024

Appendix B comprises two comparative tables: B1 Major Industries and B2 Productivity.

Table B1. Major Private Industries (2024)

Parameter	Code	PL	GR	HR	ES	MT	DE	FI	DK	NL	CH	NO
Industry 1	B1.1	Manufacturing	Wholesale & retail	Manufacturing	Wholesale & retail	ICT / gaming	Manufacturing	Manufacturing	Manufacturing	Manufacturing	Manufacturing / pharma	Oil & gas
Industry 1 NACE	B1.1.1	C	G	C	G	J	C	C	C	C	C	B
Industry 1 GVA (€ bn)	B1.1.2	180	32.5	11	180	4	950	50	74	150	165	140
Industry 1 employees (000)	B1.1.3	3,100	750	240	3,350	30	7,750	325	350	1,000	750	200
Industry 1 compensation (€ bn)	B1.1.4	55	11	3.5	70	1.2	375	20	28.5	60	62.5	21.5
Average annual compensation per employee (€)	B1.1.a	17,742	14,667	14,583	20,896	40,000	48,387	61,538	81,429	60,000	83,333	107,500
GVA per employee (€)	B1.1.b	58,065	43,333	45,833	53,731	133,333	122,581	153,846	211,429	150,000	220,000	700,000
Compensation / GVA per employee (%)	B1.1.c	30.6	33.8	31.8	38.9	30	39.5	40	38.5	40	37.9	15.4

Table B2. Industry Productivity and Compensation (2024)

Parameter	Code	PL	GR	HR	ES	MT	DE	FI	DK	NL	CH	NO
Manufacturing GVA / employee (€)	B2.1	60,000	57,500	47,500	77,500	60,000	125,000	150,000	210,000	150,000	215,000	190,000
Manufacturing compensation / employee (€)	B2.2	18,500	21,500	16,000	32,500	26,000	51,500	60,000	81,500	60,000	85,000	72,500
ICT GVA / employee (€)	B2.3	80,000	80,000	65,000	92,500	140,000	120,000	145,000	162,500	145,000	190,000	160,000
ICT compensation / employee (€)	B2.4	27,500	30,000	30,000	45,000	42,500	60,000	72,500	90,000	62,500	82,500	70,000
Finance GVA / employee (€)	B2.5	90,000	90,000	80,000	115,000	120,000	155,000	175,000	235,000	195,000	350,000	200,000
Finance compensation / employee (€)	B2.6	32,500	32,000	30,000	52,500	52,500	72,500	75,000	97,500	80,000	130,000	80,000
Professional services GVA / employee (€)	B2.7	47,500	47,500	52,500	67,500	70,000	82,500	100,000	132,500	90,000	125,000	125,000
Professional services compensation / employee (€)	B2.8	20,000	18,500	21,000	31,500	35,000	45,000	50,000	75,000	45,000	60,000	57,500
Manufacturing compensation / GVA per employee (%)	B2.(2/1)	30.8	37.4	33.7	41.9	43.3	41.2	40	38.8	40	39.5	38.2
ICT compensation / GVA per employee (%)	B2.(4/3)	34.4	37.5	46.2	48.6	30.4	50	50	55.4	43.1	43.4	43.8
Finance compensation / GVA per employee (%)	B2.(6/5)	36.1	35.6	37.5	45.7	43.8	46.8	42.9	41.5	41	37.1	40
Professional services compensation / GVA per employee (%)	B2.(8/7)	42.1	38.9	40	46.7	50	54.5	50	56.6	50	48	46