

# Macroeconomic Drivers of Economic Recovery: An Analysis of Household Consumption, Investment, Government Expenditure, and Net Exports in European Union Countries (2021–2025)

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## Abstract

*This study investigates the role of key macroeconomic components in shaping economic recovery across European Union countries during 2021–2025. In particular, the study focuses on household consumption, investment, government expenditure, and net exports as primary determinants of Gross Domestic Product (GDP) in the post-pandemic environment. The analysis utilizes secondary data obtained from the Eurostat database, covering multiple EU member states over five years. A quantitative approach is employed, and the relationships among variables are examined using Partial Least Squares Structural Equation Modeling (PLS-SEM) in SmartPLS. The post-pandemic period presents a distinct macroeconomic context characterized by policy-driven recovery, shifts in consumption patterns, and disruptions in global trade. Therefore, understanding the relative contribution of domestic and external demand components becomes essential. The findings reveal that, collectively, the selected macroeconomic variables significantly contribute to variations in GDP. At the individual level, investment emerges as the most influential factor, indicating its central role in supporting economic restructuring and long-term growth. Household consumption and government expenditure also demonstrate substantial effects, particularly in reinforcing aggregate demand during the recovery phase. On the other hand, net exports have a comparatively limited influence, reflecting ongoing uncertainties in international trade and external demand. These results suggest that economic recovery within the European Union is largely driven by domestic factors, with investment playing a leading role. Accordingly, policymakers are encouraged to prioritize investment-oriented strategies, strengthen consumption capacity, and enhance trade resilience to ensure sustainable economic growth in the evolving global landscape.*

**Keywords:** *Economic recovery, Gross Domestic Product (GDP), Investment, Household consumption, Government expenditure, Net exports, European Union*

## 1. Introduction

The COVID-19 pandemic has caused a significant disruption to global economic systems, affecting production, consumption, investment, and international trade across countries. In the European Union (EU), the pandemic led to a sharp economic contraction, followed by a

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### Article history:

Received (December 26, 2025), Review Result (January 30, 2026), Accepted (March 3, 2026)

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gradual recovery characterized by strong policy interventions, structural adjustments, and evolving demand patterns. The recovery process has not been uniform, as it is influenced by both domestic economic conditions and external shocks [1][2].

Economic recovery in the post-pandemic period extends beyond the restoration of output levels; it reflects broader structural transformation and resilience-building processes. Recent studies indicate that recovery dynamics in the EU are shaped by multiple macroeconomic factors, including fiscal policy responses, consumption behavior, investment performance, and global trade conditions [1][3]. In particular, variations in recovery speed across countries highlight the importance of understanding the relative contribution of these macroeconomic components.

From a macroeconomic perspective, Gross Domestic Product (GDP) remains the primary indicator for assessing economic recovery and performance. GDP is determined by four key expenditure components: household consumption, investment, government expenditure, and net exports. During the pandemic, these components experienced substantial disruptions. For instance, containment measures and uncertainty led to a decline in household consumption and investment, while global supply chain disruptions significantly reduced trade flows [3].

Household consumption plays a crucial role in economic recovery, as it directly contributes to aggregate demand. However, post-pandemic consumption patterns have been influenced by precautionary savings behavior and income uncertainty, resulting in uneven recovery across EU countries [7]. Fiscal policy interventions, particularly government expenditures, have been widely implemented to stabilize economic activity. Empirical evidence suggests that government spending is positively associated with economic stabilization and recovery during periods of economic shocks [4]. In the EU, large-scale fiscal support programs have helped maintain employment and stimulate demand during the recovery phase [5].

Investment is another critical driver of economic recovery, particularly in supporting long-term growth and productivity. Post-pandemic recovery strategies in the EU have emphasized public and private investment, especially in infrastructure, digital transformation, and green transition initiatives. However, investment performance remains sensitive to economic uncertainty, financial conditions, and geopolitical risks, which continue to shape recovery trajectories [6][8].

Meanwhile, the role of net exports in the recovery process remains uncertain. Although global trade has shown signs of recovery following the pandemic, it remains affected by supply chain disruptions, geopolitical tensions, and fluctuating demand. As a result, the contribution of external demand to economic recovery varies across countries and is often less stable than that of domestic demand components.

Recent empirical studies emphasize that post-pandemic economic recovery is largely driven by domestic factors, particularly consumption, investment, and government spending. In contrast, external factors such as net exports exhibit greater volatility [2][8]. This shift suggests that the determinants of economic growth in the recovery period may differ from those observed in pre-pandemic conditions, highlighting the need for updated empirical analysis [9].

Based on this background, this study aims to analyze the roles of household consumption, investment, government expenditure, and net exports in shaping economic recovery in European Union countries during 2021–2025. Specifically, the study examines both the simultaneous and partial effects of these variables on GDP using a quantitative approach. By focusing on the post-pandemic period, this study contributes to the literature by providing

updated empirical evidence on macroeconomic recovery dynamics and offering policy-relevant insights for sustaining economic growth in the European Union.

## **2. Literature review**

### **2.1. Economic recovery and macroeconomic framework**

Economic recovery refers to the process through which an economy rebounds from a downturn and gradually returns to a stable growth trajectory. In the post-pandemic context, recovery is not limited to restoring output levels but also involves structural transformation, resilience-building, and adaptation to new economic conditions. Recent studies emphasize that recovery dynamics are shaped by both domestic demand factors and external economic conditions, particularly in integrated regions such as the European Union [10][11].

From a theoretical perspective, Keynesian economics emphasizes the role of aggregate demand—consumption, investment, government expenditure, and net exports—as the primary driver of economic recovery. During periods of economic crisis, expansionary fiscal policy is often necessary to stimulate demand and stabilize output [12]. In contrast, neoclassical perspectives emphasize the importance of investment, productivity, and efficient resource allocation in sustaining long-term growth [13].

Recent empirical literature suggests that post-pandemic recovery is largely driven by domestic demand components, especially consumption and investment, while external demand remains volatile due to global uncertainties [11][14]. This indicates a shift in the relative importance of GDP components compared to pre-pandemic conditions.

### **2.2. Household consumption and economic recovery**

Household consumption is a fundamental component of aggregate demand and plays a central role in driving short-term economic recovery. According to macroeconomic theory, consumption is positively related to income levels and consumer confidence. However, in the post-pandemic period, consumption patterns have been significantly affected by uncertainty, precautionary savings behavior, and labor market disruptions.

Empirical studies show that consumption recovery in the EU has been uneven across countries, driven by differences in fiscal support, income stability, and household expectations. Baker et al. found that consumer spending declined sharply during the pandemic but recovered gradually as mobility restrictions were lifted [15]. Similarly, Deb et al. highlighted that income shocks and policy responses significantly influenced consumption dynamics during crisis periods [16].

More recent findings suggest that household consumption remains a key driver of economic recovery, although its effectiveness depends on the strength of income recovery and consumer confidence [10][15]. Therefore, consumption is expected to have a positive and significant effect on GDP in the post-pandemic period.

### **2.3. Government expenditure and fiscal policy response**

Government expenditure plays a critical role in mitigating economic downturns and supporting recovery. Keynesian theory posits that increased government spending can stimulate aggregate demand and offset declines in private sector activity during crises [12]. In the context of the COVID-19 pandemic, fiscal policy interventions have been widely implemented to stabilize economies and accelerate recovery.

Empirical evidence indicates that government expenditure positively affects economic growth, particularly during periods of economic instability. For example, Deb et al. demonstrated that fiscal stimulus measures significantly contributed to economic stabilization during the pandemic [16]. Similarly, Bloom found that fiscal multipliers tend to be larger during recessions, reinforcing the effectiveness of government spending in recovery periods [18].

In the European Union, large-scale fiscal programs such as the NextGenerationEU initiative have played a crucial role in supporting recovery efforts, particularly in investment and social protection sectors [17]. These findings suggest that government expenditure remains a significant determinant of GDP in the post-pandemic context.

#### **2.4. Investment and long-term economic growth**

Investment is widely recognized as a key driver of long-term economic growth and structural transformation. It contributes to capital accumulation, technological innovation, and productivity improvement. In the context of economic recovery, investment plays a dual role: stimulating short-term demand and supporting long-term development.

Recent studies indicate that investment recovery has been uneven across countries due to uncertainty, financial constraints, and geopolitical risks. Bloom emphasized that uncertainty negatively affects investment decisions, particularly during periods of economic instability [18]. However, targeted investment policies, especially in infrastructure and green technologies, can enhance recovery and resilience.

Empirical evidence from the EU suggests that investment is one of the most influential components of GDP during the recovery phase, particularly in supporting structural transformation and economic modernization [17][18]. Therefore, investment is expected to have a strong and significant impact on GDP.

#### **2.5. Net Exports and external sector dynamics**

Net exports represent the contribution of the external sector to economic growth. In open economies such as those in the EU, international trade plays an important role in shaping economic performance. However, the role of net exports in the post-pandemic recovery is complex and uncertain.

The pandemic caused significant disruptions to global supply chains, trade flows, and production networks. Although global trade has shown signs of recovery, it remains volatile due to geopolitical tensions and shifting demand patterns. Baldwin and Freeman argued that supply chain reconfiguration and trade fragmentation may reduce the stability of external demand in the long term [19].

Recent empirical studies suggest that the contribution of net exports to GDP recovery is less stable than that of domestic demand components [14][19]. As a result, net exports may have a weaker or insignificant effect on GDP in the post-pandemic period.

#### **2.6. Research gap and hypothesis development**

Based on the reviewed literature, while numerous studies have examined the relationship between macroeconomic variables and GDP, limited research has focused specifically on the post-pandemic recovery period in the European Union. Furthermore, existing studies indicate a potential shift in the relative importance of GDP components, with domestic demand playing a more dominant role compared to external demand.

Therefore, this study seeks to address this gap by analyzing the effects of household consumption, investment, government expenditure, and net exports on GDP during the recovery period of 2021–2025. The study contributes to the literature by providing updated empirical evidence and examining whether traditional macroeconomic relationships remain valid in the post-pandemic context.

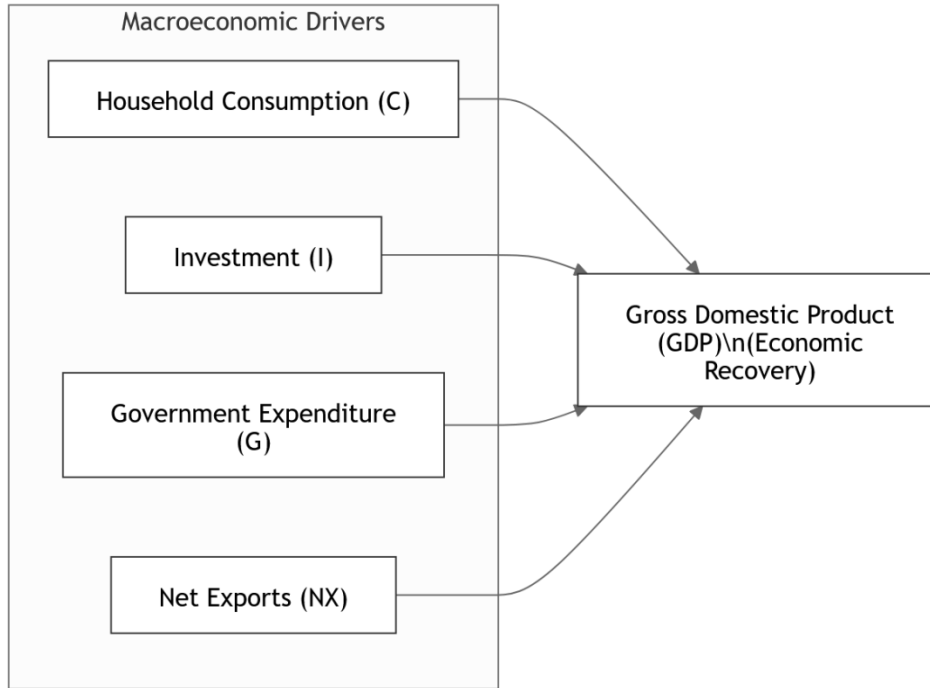


Figure 1. Conceptual Framework of Macroeconomic Drivers of Economic Recovery

The conceptual framework of this study is illustrated in Figure 1, which presents the hypothesized relationships between household consumption, investment, government expenditure, net exports, and GDP.

### 3. Methodology

#### 3.1. Research design and approach

This study employs a quantitative research design to examine the effects of household consumption, investment, government expenditure, and net exports on economic recovery, as measured by Gross Domestic Product (GDP), across European Union countries. The analysis focuses on the post-pandemic period of 2021–2025, a critical phase of economic recovery marked by fiscal interventions, structural adjustments, and evolving macroeconomic conditions.

A panel data approach is employed, combining cross-sectional data from selected EU member states with time-series observations over the five years. This approach allows for capturing both temporal dynamics and cross-country variations in economic recovery patterns.

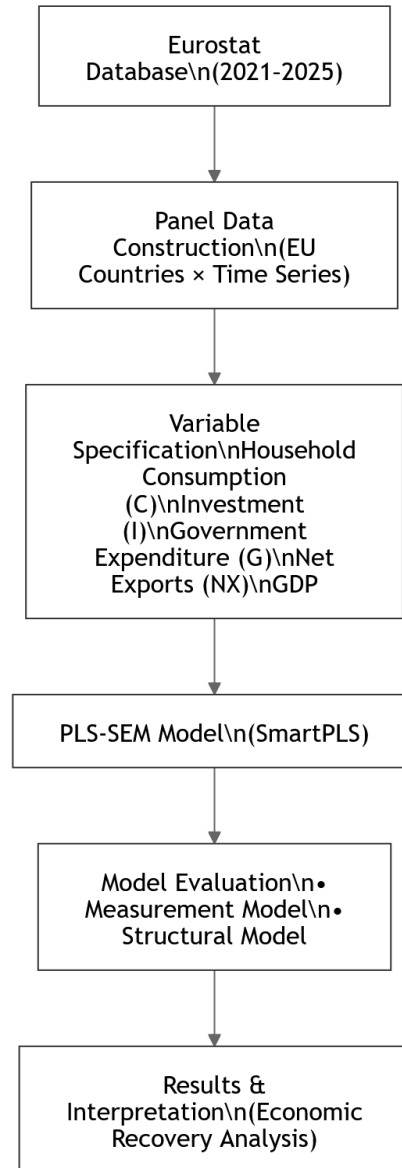


Figure 2. Data Structure and Research Workflow

The study's structured workflow, from data collection to model evaluation and interpretation, is presented in Figure 2, highlighting the sequential analytical process.

### 3.2. Data sources and sample

The study uses secondary data from the Eurostat database, which provides standardized, comparable macroeconomic indicators across European Union countries. The dataset includes annual observations for the period 2021–2025.

The variables used in this study are defined as follows:

- Gross Domestic Product (GDP): Proxy for economic recovery and overall economic performance

- Household Consumption (C): Total final consumption expenditure by households
- Investment (I): Gross capital formation, representing capital accumulation
- Government Expenditure (G): Government final consumption expenditure
- Net Exports (NX): Difference between exports and imports of goods and services

The study uses a balanced panel dataset to ensure consistent estimation and comparability across countries.

The variables used in this study are operationalized as presented in Table 1, ensuring consistency and comparability across European Union countries.

Table 1. Variable Definitions and Measurement

Variable	Symbol	Definition	Measurement Unit	Source
Gross Domestic Product	GDP	Total economic output: a proxy for economic recovery	€ (constant prices)	Eurostat
Household Consumption	C	Final consumption expenditure by households	€	Eurostat
Investment	I	Gross capital formation	€	Eurostat
Government Expenditure	G	Government final consumption expenditure	€	Eurostat
Net Exports	NX	Exports minus imports	€	Eurostat

### 3.3. Model specification

This study adopts the expenditure-based macroeconomic identity, where GDP is determined by its key components:

$$GDP = f(C, I, G, NX) \quad (1)$$

Accordingly, the structural model is specified to examine the influence of household consumption, investment, government expenditure, and net exports on GDP. Each independent variable is hypothesized to have a direct effect on GDP.

### 3.4. Analytical method: PLS-SEM approach

The analysis is conducted using Partial Least Squares Structural Equation Modeling (PLS-SEM) with SmartPLS. PLS-SEM is a variance-based structural equation modeling technique that is particularly suitable for predictive analysis and complex model estimation.

#### Justification for Using PLS-SEM

The use of PLS-SEM in this study is justified based on several methodological considerations:

1. Suitability for Small to Medium Sample Sizes. Compared to covariance-based SEM, PLS-SEM is more appropriate for studies with relatively limited sample sizes, which is often the case in macroeconomic panel data involving a finite number of countries.
2. Robustness to Non-Normal Data Distribution. Macroeconomic data, especially in the post-pandemic period, often exhibit non-normal distributions due to economic shocks and structural changes. PLS-SEM does not require strict normality assumptions, making it suitable for this context.
3. Capability for Predictive Modeling. This study aims not only to test theoretical relationships but also to assess the predictive influence of macroeconomic

variables on GDP during the recovery period. PLS-SEM is widely recognized for its strong predictive capability.

4. **Simultaneous Estimation of Multiple Relationships.** PLS-SEM allows for the simultaneous estimation of multiple dependent relationships within a structural model, making it appropriate for analyzing the combined effects of consumption, investment, government expenditure, and net exports on GDP.
5. **Flexibility in Model Specification.** The method is flexible in handling complex models and can accommodate both reflective and formative constructs, which is beneficial when modeling macroeconomic systems with interrelated variables.

### 3.5. Model evaluation

The analysis consists of two main stages:

#### 1. Measurement Model Evaluation

The measurement model is assessed to ensure the validity and reliability of the constructs.

This includes:

- Indicator reliability
- Internal consistency reliability
- Convergent validity
- Discriminant validity

#### 2. Structural Model Evaluation

The structural model is evaluated to test the hypothesized relationships among variables, including:

- Path coefficients ( $\beta$  values)
- Coefficient of determination ( $R^2$ )
- Effect size ( $f^2$ )
- Predictive relevance ( $Q^2$ )

### 3.6. Hypothesis development

Based on the theoretical and empirical literature, the following hypotheses are formulated:

- H1: Household consumption has a positive and significant effect on GDP
- H2: Investment has a positive and significant effect on GDP
- H3: Government expenditure has a positive and significant effect on GDP
- H4: Net exports have a positive effect on GDP

The hypothesized relationships between macroeconomic variables and GDP are summarized in Table 2, reflecting the theoretical expectations derived from prior literature.

Table 2. Summary of Hypotheses

Hypothesis	Relationship	Expected Effect
H1	Household Consumption $\rightarrow$ GDP	Positive
H2	Investment $\rightarrow$ GDP	Positive
H3	Government Expenditure $\rightarrow$ GDP	Positive
H4	Net Exports $\rightarrow$ GDP	Positive

## 4. Results and discussion

### 4.1. Descriptive analysis and post-pandemic context

The descriptive statistics indicate that macroeconomic variables across European Union countries exhibit considerable variation during the 2021–2025 period. This variation reflects the uneven pace of economic recovery following the COVID-19 pandemic. Countries that implemented stronger fiscal support and investment programs tend to show higher levels of GDP and domestic demand components.

In the post-pandemic context, fluctuations in household consumption and investment are particularly evident. This is consistent with the economic recovery phase, where consumption gradually rebounds as mobility restrictions are lifted, while investment responds more slowly due to uncertainty and financial constraints. Government expenditure, on the other hand, remains relatively stable and elevated, reflecting continued fiscal support measures.

### 4.2. Structural model results

The structural model estimated using PLS-SEM reveals that all independent variables—household consumption, investment, government expenditure, and net exports—jointly explain the variation in GDP. The coefficient of determination ( $R^2$ ) indicates that the model has strong explanatory power, suggesting that the selected macroeconomic variables are highly relevant in capturing the dynamics of economic recovery.

In terms of individual effects, investment demonstrates the strongest positive influence on GDP, followed by household consumption and government expenditure. Net exports, although positively associated with GDP, exhibit a relatively weak effect compared to domestic demand components.

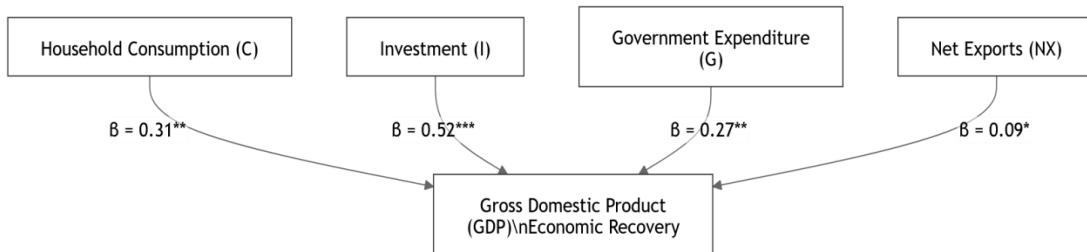


Figure 3. PLS-SEM Structural Model with Path Coefficients

The estimated structural relationships among household consumption, investment, government expenditure, net exports, and GDP are presented in Figure 3, which shows that investment has the strongest positive effect on economic recovery, followed by household consumption and government expenditure. In contrast, net exports exhibit a comparatively weaker contribution.

### 4.3. Discussion of key findings

The relative magnitude of the effects of household consumption, investment, government expenditure, and net exports on GDP is summarized in Figure 4, which highlights investment as the most influential driver of post-pandemic economic recovery in European Union countries.

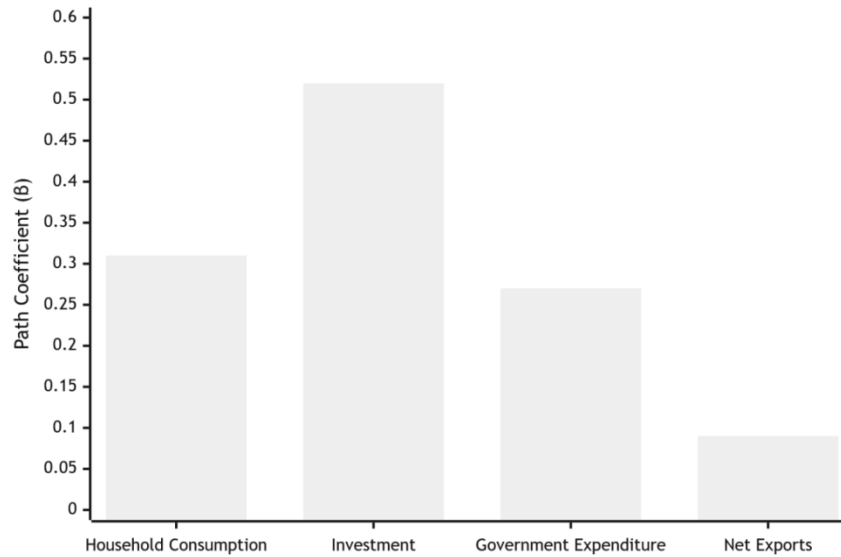


Figure 4. Comparative impact of macroeconomic variables on GDP

#### 4.3.1. Investment as the primary driver of recovery

The findings indicate that investment plays the most significant role in shaping GDP during the post-pandemic recovery. This result highlights the importance of capital formation in restoring economic activity and supporting long-term growth. In the EU context, recovery strategies have emphasized investment in infrastructure, digitalization, and green transition, which contribute to productivity enhancement and structural transformation.

From a theoretical perspective, this finding aligns with neoclassical growth theory, which emphasizes the role of capital accumulation in driving economic expansion. In the post-pandemic setting, investment not only stimulates aggregate demand but also strengthens supply-side capacity, making it a critical component of sustainable recovery.

#### 4.3.2. The role of household consumption in demand stabilization

Household consumption is found to have a significant positive effect on GDP, indicating its role in stabilizing aggregate demand during the recovery phase. As economic restrictions were gradually lifted, consumption rebounded, supported by accumulated savings and improved labor market conditions.

However, the contribution of consumption remains sensitive to income uncertainty and inflationary pressures. This suggests that while consumption supports short-term recovery, its long-term sustainability depends on stable income growth and consumer confidence. Therefore, policies aimed at strengthening household purchasing power remain essential.

#### 4.3.3. Government expenditure and policy-driven recovery

Government expenditure also exhibits a positive and significant impact on GDP, reflecting the effectiveness of fiscal policy in mitigating the economic consequences of the pandemic. During the recovery period, EU governments implemented large-scale fiscal stimulus programs, including public investment, social protection, and business support measures.

The findings confirm the Keynesian argument that government spending plays a countercyclical role during economic downturns. In the post-pandemic period, fiscal policy

not only supported demand but also facilitated structural transformation through targeted investments. However, the sustainability of such policies remains a concern, particularly given public debt levels.

#### **4.3.4. Limited contribution of net exports**

In contrast to domestic demand components, net exports show a relatively weak effect on GDP. This result reflects the ongoing uncertainty in global trade conditions, including supply chain disruptions, geopolitical tensions, and fluctuating external demand.

Although international trade has partially recovered, its contribution to economic growth remains less stable than that of domestic factors. This suggests that EU economic recovery during the study period is primarily driven by internal demand rather than external trade. The finding also indicates the need to enhance export competitiveness and diversify trade partnerships to reduce vulnerability to external shocks.

#### **4.4. Integrated interpretation**

Overall, the results suggest that post-pandemic economic recovery in European Union countries is predominantly driven by domestic demand components, particularly investment and household consumption. Government expenditure plays a supporting role by stabilizing the economy and facilitating recovery, while net exports contribute less significantly due to external uncertainties.

This shift toward domestic-driven recovery highlights a structural change from pre-pandemic growth patterns, in which external trade often played a more prominent role. The findings imply that strengthening domestic economic resilience is essential for sustaining long-term growth in an increasingly uncertain global environment.

#### **4.5. Policy implications**

Based on the findings, several policy implications can be derived:

1. **Prioritizing Investment-Led Growth.** Governments should continue to promote investment, particularly in strategic sectors such as infrastructure, digitalization, and green energy, to sustain long-term economic growth.
2. **Strengthening Household Consumption.** Policies aimed at increasing income stability, employment opportunities, and consumer confidence are crucial to maintaining aggregate demand.
3. **Maintaining Effective Fiscal Policy.** While fiscal stimulus has been effective in supporting recovery, policymakers must balance short-term support with long-term fiscal sustainability.
4. **Enhancing Trade Resilience.** Efforts should be made to diversify export markets and strengthen supply chain resilience to improve the contribution of net exports to economic growth.

### **5. Conclusion**

This study provides an updated empirical perspective on the macroeconomic drivers of economic recovery in European Union countries during the post-pandemic period of 2021–2025. By examining the roles of household consumption, investment, government expenditure, and net exports within a unified analytical framework, the study contributes to a

more nuanced understanding of how traditional GDP components operate under conditions of economic disruption and recovery.

From a theoretical standpoint, this study extends the conventional macroeconomic framework by situating it within a post-crisis recovery context, where structural adjustments and policy interventions significantly influence economic dynamics. The findings reinforce the relevance of aggregate demand theory while also highlighting the increasing importance of investment as a central mechanism for both recovery and long-term growth. In doing so, the study bridges short-term stabilization perspectives with long-term development considerations.

From an empirical perspective, the study contributes by providing recent evidence based on post-pandemic data, addressing a gap in the literature that has largely focused on pre-pandemic relationships. The results suggest that the relative importance of macroeconomic components has shifted, with domestic demand factors playing a more dominant role compared to external trade. This shift reflects broader changes in the global economic environment, including increased uncertainty and evolving trade structures.

In terms of policy implications, the findings underscore the importance of maintaining a balanced and forward-looking macroeconomic strategy. Investment-oriented policies should be prioritized to support structural transformation and productivity growth, particularly in digitalization, infrastructure, and sustainable development. At the same time, strengthening household consumption through income stability and employment generation remains essential for sustaining aggregate demand. While government expenditure continues to play a critical stabilizing role, policymakers must also ensure fiscal sustainability in the medium- to long-term. Additionally, enhancing trade resilience through diversification and supply chain strengthening is necessary to improve the external sector's contribution.

Despite its contributions, this study is subject to several limitations. The analysis is based on aggregated macroeconomic data, which may not fully capture country-specific institutional differences and sectoral dynamics. Furthermore, using annual data may limit the ability to observe short-term fluctuations and rapid policy impacts during the recovery phase.

Therefore, future research is encouraged to extend this study by incorporating higher-frequency data, such as quarterly observations, to capture short-term dynamics better. Comparative studies across different regions or income groups may also provide deeper insights into heterogeneous recovery patterns. In addition, integrating other relevant variables—such as inflation, interest rates, and labor market indicators—could further enhance the model's explanatory power and provide a more comprehensive understanding of the post-pandemic economic recovery.

In conclusion, this study highlights the evolving nature of macroeconomic relationships in the post-pandemic era and underscores the need for adaptive policy approaches to sustain and resilient economic growth.

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