



**Economic impact of investments in new  
motorways infrastructure**



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# Presentation outline

- Key variables of transport demand growth
- Transport trends and prospects
- Transport economic footprint and decision making
- Needs, objectives and methodology framework to estimate transport infrastructure economic effects
- Types, outputs and mechanism of economic development impact
- Case studies and highlights on economic contribution of large transport infrastructure development in various regions
- Discussion issues and concluding remarks to industry and investors



# Decision Making in Infrastructure Development

- ❑ Governments and decision makers promote investments in large transportation infrastructure projects in order to achieve socioeconomic goals
- ❑ One of the most critical issues of decision makers is to review which projects will be funded in order to stimulate economic growth
- ❑ The complexity in decision process deals with the number and the variety of stakeholders, the alternative options in project financing and the different expectations for the parties involved in decision
- ❑ Especially, the decisions for the implementation of large infrastructure projects where large amount of capitals are reserved, the decision time may vary from few years to decades
- ❑ This misleading may is a major concern in strategic planning process



Source: Dimitriou et al., FFM, Marseille, 2014



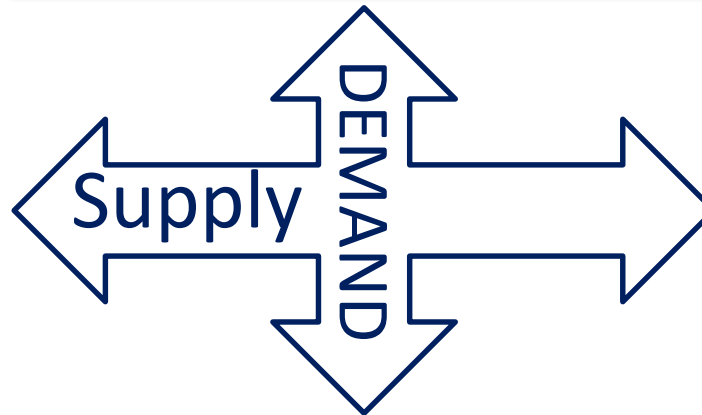
# Transport Infrastructure Corporate Decision Making Equilibrium

## ➤ Strategy

- Development of Transport market
- Market regulation - protection
- Funding - new investments
- Social impact and CRS

## ➤ Planning

- New Infrastructure
- Business Sustainability
- Business Development
- Social benefits return



## ➤ Innovation

- Products - services
- ITS
- Smart business
- Research

## ➤ Competitiveness

- Regulatory framework
- Monitoring/Review performance
- Analysis of the competition

Dimitriou et al., 2017, IJESRT, 6(1)



# Key questions in strategic planning and decision making



Strategic planning and DSS

➤ What is the Region  
Economic Base

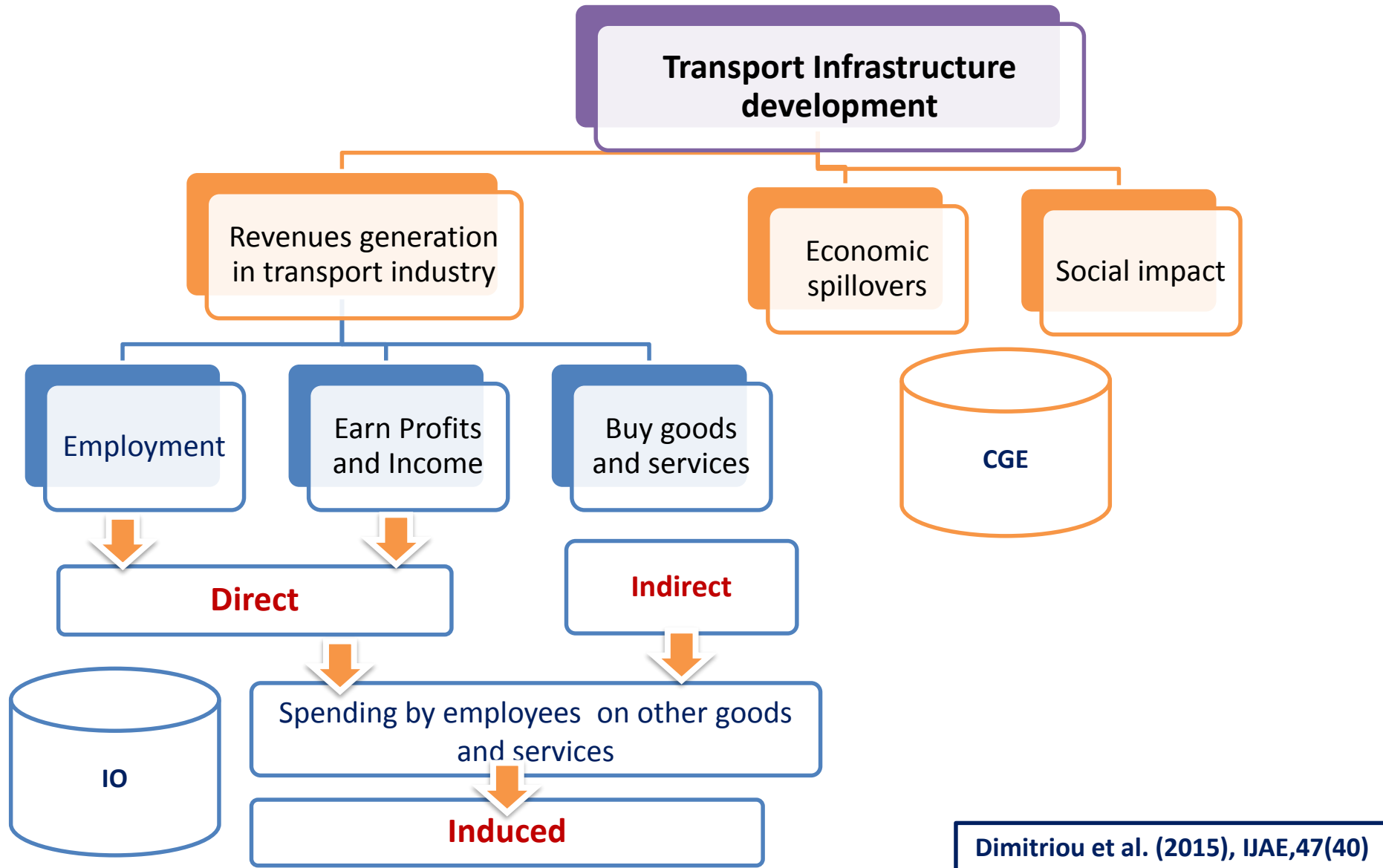
➤ How many jobs will be  
gained?

What will be the ripple effects  
across the Regional Economic  
System?

➤ How much total Output  
will be gained?

Dimitriou et al. 2015, IJAE,47(40)

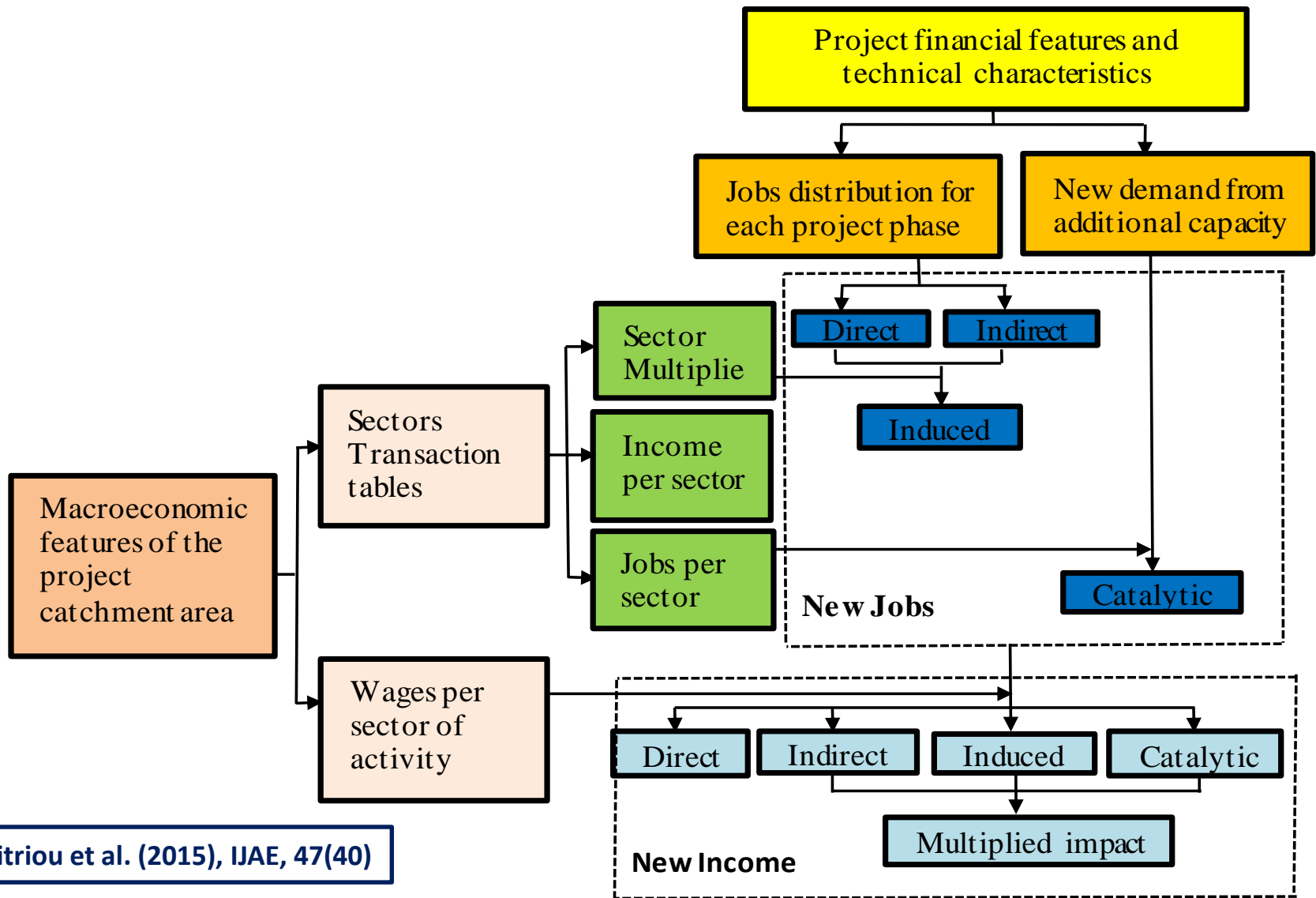
# Types of Impact and methodology of footprint analysis



Dimitriou et al. (2015), IJAE,47(40)



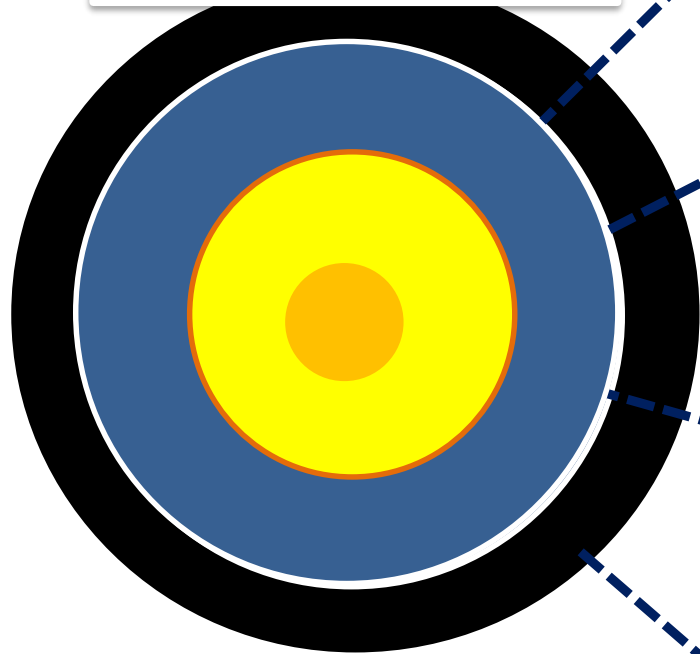
# Methodology framework



# Cycles of Economic Impact

Source: Dimitriou & Sartzetaki, Int. Journal of Aviation Studies, (2011)

## Types of Impact



### **DIRECT**

Generated by firms which will construct and operate the transportation infrastructure

### **INDIRECT**

Generated by wider supply-chain firms purchasing goods and services from nation-based suppliers, in turn generating output, profits and employment among suppliers

### **INDUCED**

Recycling of Euros as a result of spending from direct and indirect

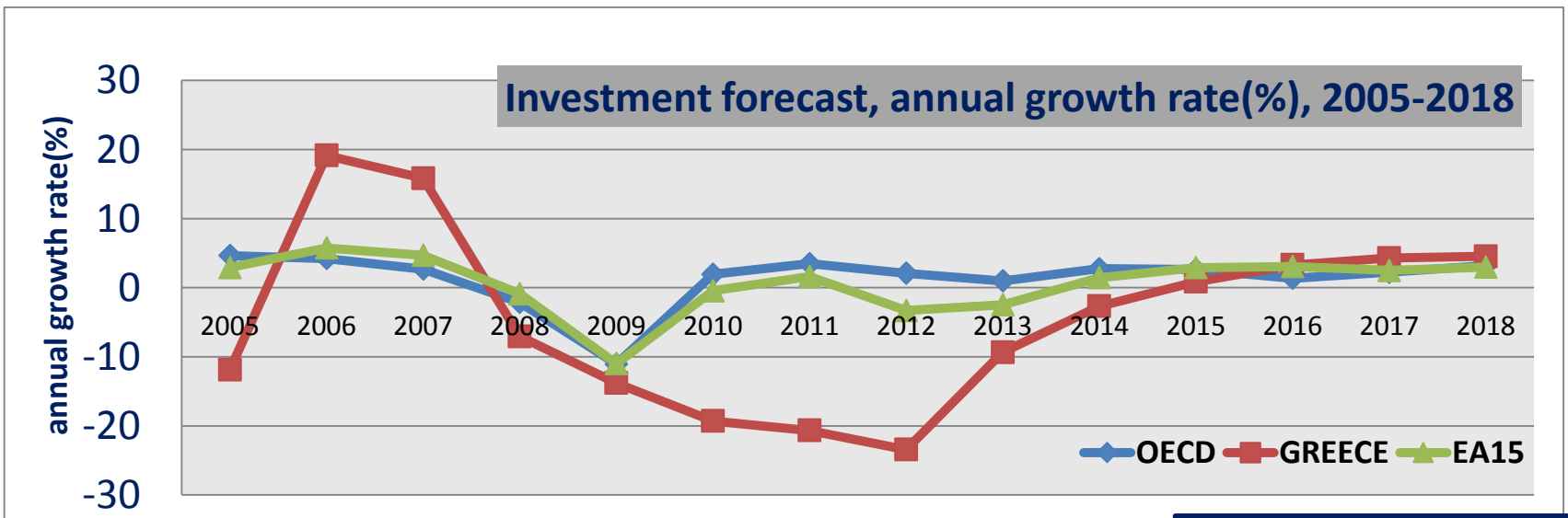
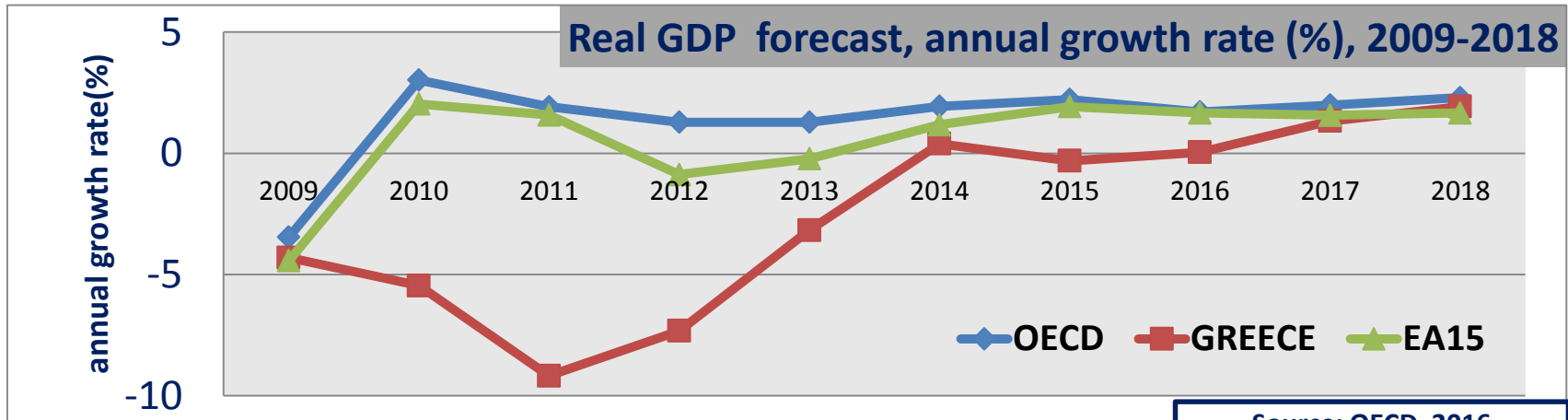
### **CATALYTIC IMPACT**

Improvement of the accessibility of a given region by reducing travel time and the changes in the interregional trade





# Case studies: Transport Infrastructure Investment in Greece



# Case Studies: Mega transport infrastructures in Greece



Concession Motorways



Rail line upgrade in North Greece



EUROPE




Hub airport



Ports privatization



New airport investment

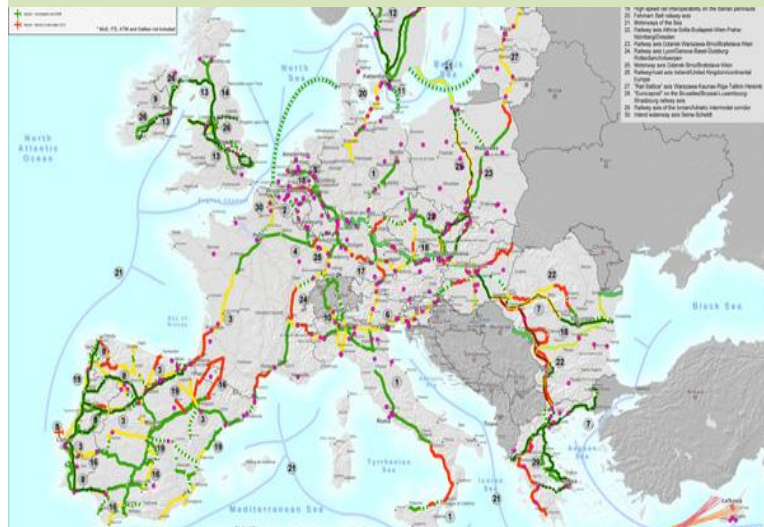


14 concessioned airports

# Case study: Motorways Investments in Greece

Source: Dimitriou et al., Int. Conference on Forecasting Financial Market, (FFM, Marseille, 2014)

The motorways are part of the priority projects of the TEN-T network, which connect Greece to the rest of the EU.



**TRANS-EUROPEAN TRANSPORT NETWORK**



CONCESSION MOTORWAYS PROJECT	Cost (billion €)	Length to be constructed	Length to be upgraded	Length to be operated
M1: IONIA ODOS	1.00	196	172	360
M2: AEGEAN MOTORWAY	0.95	25	205	230
M3: OLYMPIA ODOS	1.40	284	82	366
M4: CENTRAL GREECE MOTORWAY (E65)	1.37	175	-	232
<b>TOTAL</b>	<b>4.72</b>	<b>680</b>	<b>459</b>	<b>1,188</b>

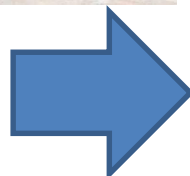
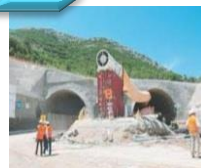


# Construction Period :T1

Source: Dimitriou et al., Int. Conference on Forecasting Financial Market, (FFM, Marseille, 2014)

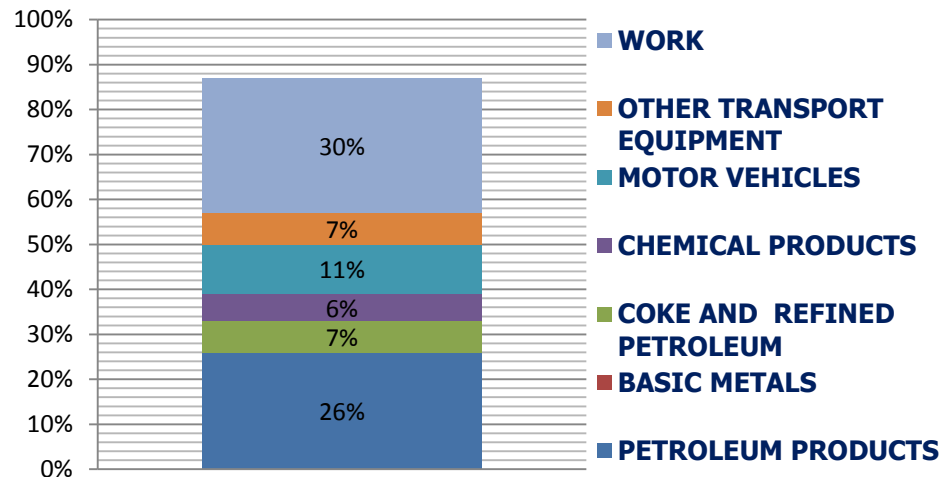
## Budget Profile

Motorway concessions	Cost (Bio euro)
IONIA ODOS –M1	1.00
AEGEAN MOTORWAY-M2	0.95
OLYMPIA ODOS-M3	1.40
CENTRAL GREECE(E65)-M4	1.37
<b>Total</b>	<b>4.71</b>



Motorway concessions	Construction period (T1) (employees per year)	
	Direct	Indirect
IONIA ODOS –M1	3,500	2,500
AEGEAN MOTORWAY-M2	3,500	2,500
OLYMPIA ODOS-M3	5,000	3,000
CENTRAL GREECE(E65)-M4	4,000	3,000
<b>Total</b>	<b>16,000</b>	<b>11,000</b>

## Sectors share



SECTORS SHARE IN CONSTRUCTION PERIOD

1	CPA_A01	
.....		
4	CPA_B	Coke and refined petroleum products
5	CPA_C10-C12	Chemicals and chemical products
8	CPA_C17	Other non-metallic mineral products
9	CPA_C18	Basic metals
.....		
14	CPA_C23	Motor vehicles, trailers and semi-trailers
15	CPA_C24	Other transport equipment
.....		
21	CPA_C30	Constructions and construction works
.....		
35	CPA_H53	Financial services, except insurance and pension funding
41	CPA_K64	Architectural and engineering services; technical testing and analysis services
.....		

# Assessment Outcome in Construction period

## Preliminary Results

Motorway concessions	Construction period (T1) (employees per year)	
	Direct	Indirect
IONIA ODOS –M1	3,500	2,500
AEGEAN MOTORWAY-M2	3,500	2,500
OLYMPIA ODOS-M3	5,000	3,000
CENTRAL GREECE(E65)-M4	4,000	3,000
<b>Total</b>	<b>16,000</b>	<b>11,000</b>

Input output  
analysis

Transaction tables

65 sectors

Motorway concessions	Construction period (T1) (employees per year)
	<b>Multiplied</b>
IONIA ODOS –M1	5,500
AEGEAN MOTORWAY-M2	5,500
OLYMPIA ODOS-M3	7,300
CENTRAL GREECE(E65)-M4	6,400
<b>Total</b>	<b>24,700</b>



**51,700 JOBS**

**DIRECT and INDIRECT:  
540 Mio Euro( Income)**

**MULTIPLIED:  
500 Mio Euro( Income)**



**%0.6 GDP**

# Assessment Outcome in Operational period

## Preliminary Results

Motorway concessions	Operational period (T2) (employees per year)
	Direct
IONIA ODOS –M1	510
AEGEAN MOTORWAY-M2	330
OLYMPIA ODOS-M3	520
CENTRAL GREECE(E65)-M4	340
<b>Total</b>	<b>1700</b>

Input output  
analysis

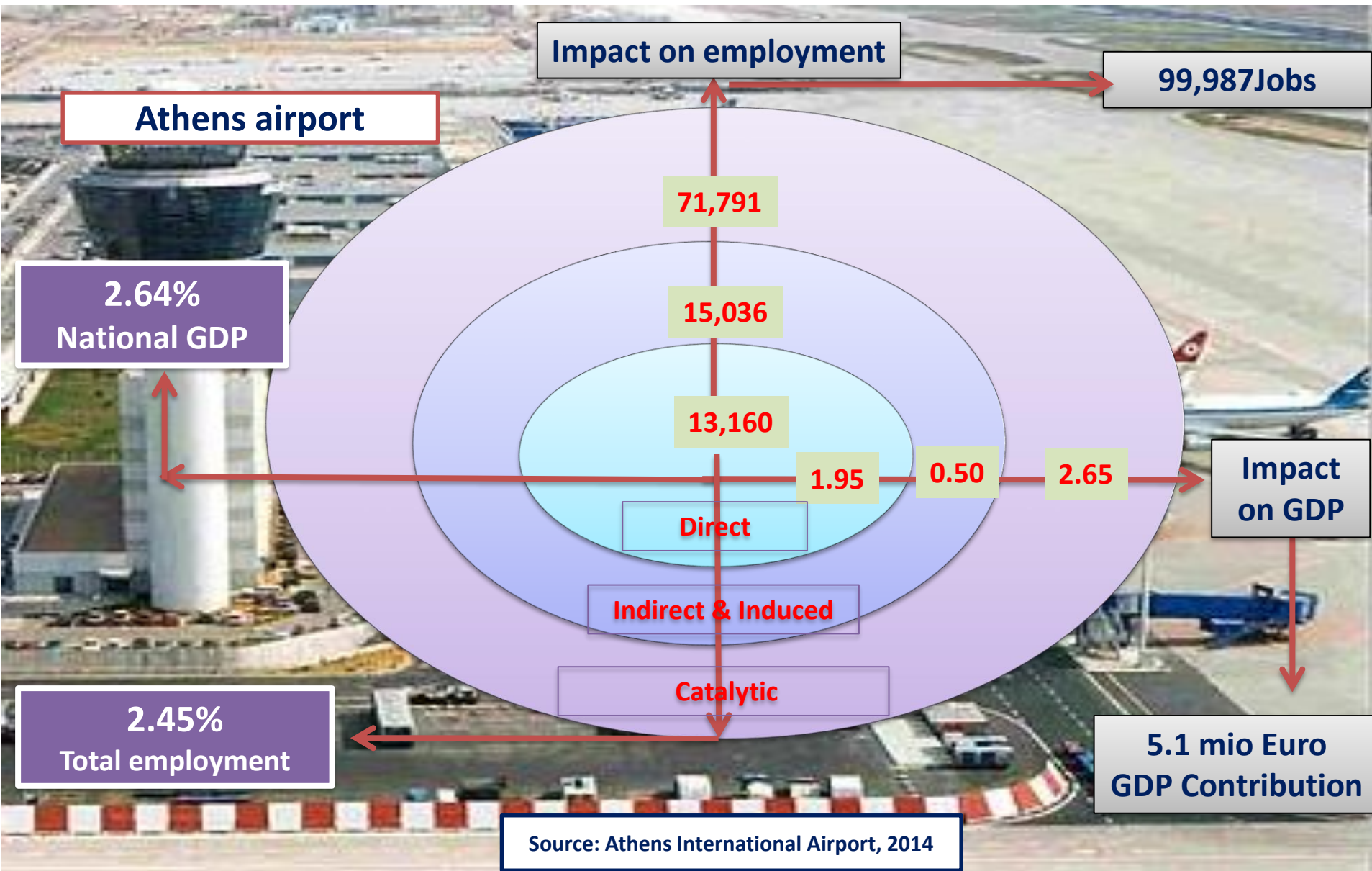
Transaction tables

65 sectors

Motorway concessions	Construction period (T1) (employees per year)
	Multiplied
IONIA ODOS –M1	465
AEGEAN MOTORWAY-M2	303
OLYMPIA ODOS-M3	470
CENTRAL GREECE(E65)-M4	312
<b>Total</b>	<b>1550</b>



# Compare with other Case Study: Athens Airport



# AIA is a pioneer PPP greenfield project

Source: Athens International Airport, 2017

55%

Hellenic Republic Asset Development Fund	30.00%
Greek State	25.00%



45%

AviAlliance	26.67%
AviAlliance Airport Capital	13.33%
Copelouzos Family	4.99%

## Ownership and Business resilience


- ✓ **1996-2026 concession contract (ADA)**
- ✓ **A 2.2 billion Euro Project - 60% funded by commercial debt**
- ✓ **User recovery principle - Dual till regulation**
- ✓ **AIA is run by a Board of Directors:**
  - (4) Private Shareholders - AviAlliance
  - (4) Greek State
  - (1) Independent (by parties' consensus, otherwise appointed by EIB)
- ✓ **AIA is "managed and operated as a commercial, profit-making company in the private sector"**





# Steady & prosperous growth between 2013-2017 & 2017 Major developments overview

Source: Dimitriou, 1<sup>st</sup> International Conference on Transport, Athens, 2017

	2013	2016	2017
No of INT'L ROUTES:	68	93 (+37%)	107 (15%↑)
Operated Countries:	41	48 (+17%)	51 (6%↑)

**Total additional weekly frequencies of which:**

**Weekly flights in new routes during S'17**  
 9 1 new

## MAJOR HIGHLIGHTS

✈ **EMIRATES**

✈ **Scot**

**3 New carriers:**

**9 New international routes:**

**1 New domestic route:**

**7 Carriers enter in already served routes:**

**20 LCCs in 49 cities (57 airports)**



Source: 1<sup>st</sup> International Conference on Transport, 2017

# Conclusions

- **The results suggest that investment in large transportation infrastructure spurs economic growth and generates employment directly through the actual construction, operation and maintenance of the project but also through indirect and induced multiplier effects across the economy**
- **The results show a strong relationship between economic infrastructure investment and sectors of construction, industries including energy and trade**
- **The estimated results provide a strong evidence of the existence of long run cointegrating relationship among infrastructure investment ,economic growth, and unemployment reduction**



# Conclusions

- ❑ **The analysis concept is essential to provide messages regarding restoring economic growth and jobs creating to shift the engine of growth from investments in large transport infrastructure projects**
- ❑ **The paper methodology and results would be used to similar cases providing results about the economic efficiency of the projects/cases.**
- ❑ **However, the results indicate that for the motorways concession project the economic impacts are highly cyclical with significant short-term employment during construction phases that disappears once the project is in operation.**





**Thank you**

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