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Investments in planted forests in southern Europe: an *ex-post* estimation of returns over the last 15 years

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Outline of the presentation

1. Introduction
2. Methodology of the research
3. Preliminary results
 - > Poplar in northern Italy
 - > Poplar in Spain
4. Final remarks and next research steps







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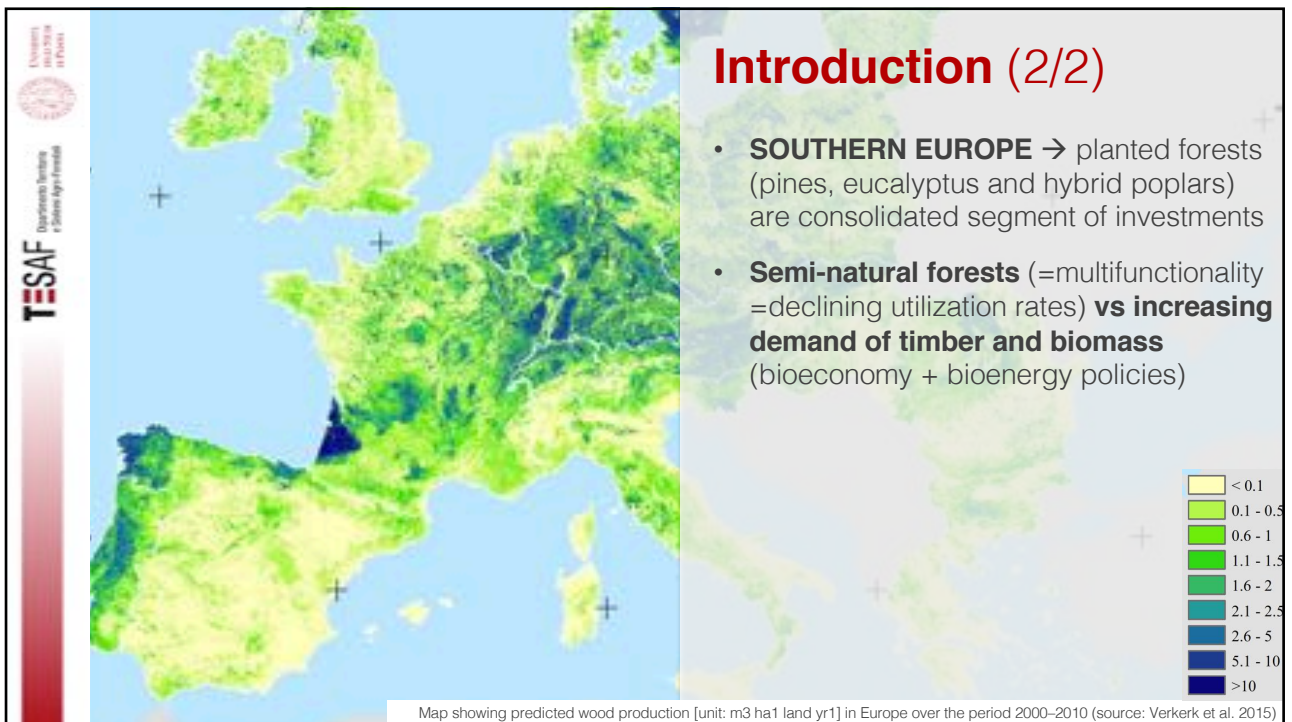




Introduction (1/2)

- **PLANTED FORESTS** → growing importance in the global forest economy
- 277.9 M ha (6.95% of forest **cover**) → +4.42 M ha/year 1990-2015
- 1/3 of global **industrial timber supply** → up to 70-80% by 2050





Research Questions and Objectives

GENERAL OBJECTIVE: to provide estimations of timber investment returns from the main productive forest plantation species in southern Europe, analyzing their recent evolution and the role of the major policy and market factors in influencing it.

RQ1 > What are the potential timber investment returns from the main productive forest plantation species in SE?

RQ2 > How has financial profitability of investments in productive forest plantations in SE evolved through recent time?

RQ3 > How have these identified policy and market factors influenced the evolution of financial profitability of productive forest plantations in SE?

RQ4 > What is the status of investments in productive forest plantations in SE and how has it evolved?

RQ5 > What is and what can be the role of planted forests in the development of a bio-based economy in SE?

SO 1 - To provide estimations of timber investment returns for the main productive forest plantation species in southern Europe;

SO 2 - To analyze timber investment returns recent evolution, estimating *ex-post* how they have changed as a function of the evolution of investments costs and timber prices;

SO 3 - To analyze the role of the major policy and market factors such as public subsidies, timber prices, land cost and opportunity-cost, in influencing timber investment returns;





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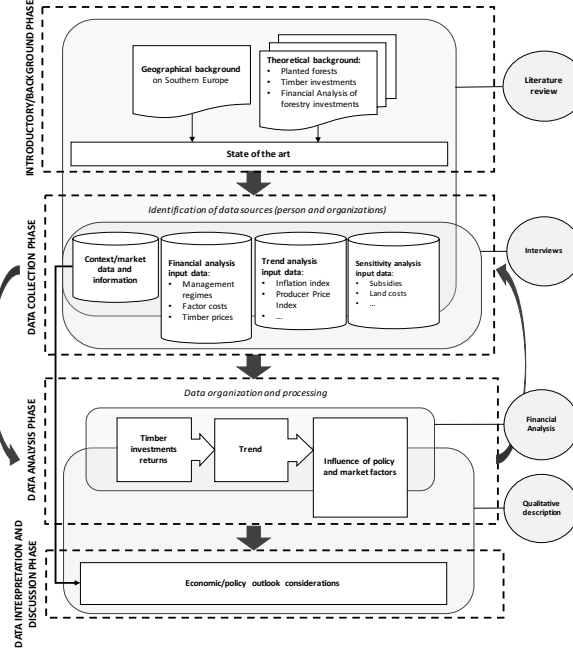
Overall methodology

APPROACH AND ASSUMPTIONS:

- > **Productive forest plantations** (timber)
- > Investment analysis → **financial approach**
- > Step-wise approach

3 KEY PHASES:

- i. Definition of **representative management regime** → Approach similar to Sedjo, 1983 and Cabbage *et al.*, 2007
- ii. Data on **investment costs, stumpage prices (and increments)**
 - Real world data from PFOs, forest managers, associations + secondary data
 - Agriculture Producer Price index (for costs)
- iii. Financial analysis
 - **IRR; NPV, LEV**
 - Deflator to get **real returns**
 - Base case + sensitivity analyses



The flowchart illustrates the methodology in four main phases, each in a dashed box:

- INTRODUCTORY/BACKGROUND PHASE:** Includes 'Geographical background on Southern Europe' and 'Theoretical background' (Planted forests, Timber investments, Financial Analysis of forestry investments). It leads to a 'State of the art' box and a 'Literature review' circle.
- DATA COLLECTION PHASE:** Titled 'Identification of data sources (person and organizations)'. It contains four boxes: 'Context/market data and information', 'Financial analysis input data' (Management regimes, Factor costs, Timber prices), 'Trend analysis input data' (Inflation index, Producer Price Index, ...), and 'Sensitivity analysis input data' (Subsidies, Land costs, ...). It leads to an 'Interviews' circle.
- DATA ANALYSIS PHASE:** Titled 'Data organization and processing'. It shows a flow from 'Timber investments returns' to 'Trend' to 'Influence of policy and market factors'. It leads to 'Financial Analysis' and 'Qualitative description' circles.
- DATA INTERPRETATION AND DISCUSSION PHASE:** Contains 'Economic/policy outlook considerations'.

A vertical arrow on the left indicates a 'Step-wise approach' moving from top to bottom.



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Poplar in the northern Italy (Po valley)

CONTEXT AND MARKET OVERVIEW:

- **Most important segment of industrial timber production** in Italy (>50% of domestic supply)
- Plywood and wood-based panels industries
- **Decline since the 1980s** → from 175,000ha (1975) to 66,000 (2005)

SPECIFIC MATERIALS AND METHODS

- **10y rotations, 278trees/ha (5% mortality)**
- **4 models** based on costs and prices → CminPmax, CminPmin, CmaxPmin, CmaxPmax
- **Costs:** 3 private poplar growers, 3 agricultural farms, Associazione Pioppicoltori Italiani (API)
- **Stumpage prices** ← Chambers of Commerce

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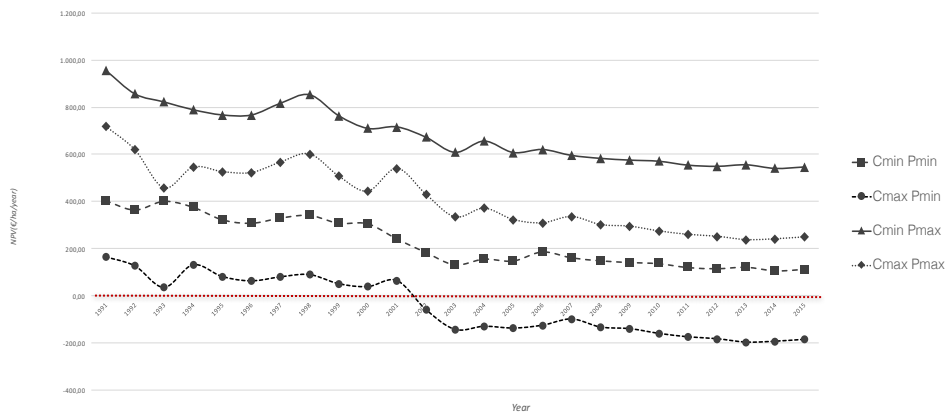
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Results (1/2): Base case scenario

- IRR 2015 → Best = 12.1%; Average IRR = 6.2%
- NPV 2015 (r=3.5%) = -195 to 518€/ha/yr
- IRR



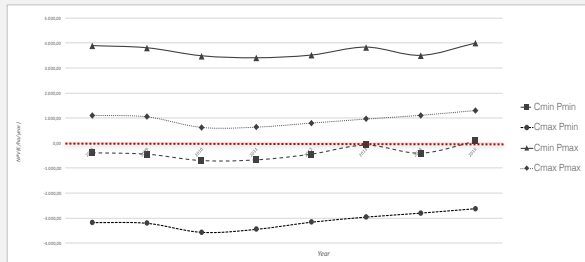
NPV with a 3.5% discount rate for the base case scenario, 1991-2015 (real values)

Results (2/2): Sensitivity analysis

Base-case scenario + opportunity cost

- Corn ← Farm Accountancy Data Network (FADN) (*No Direct Payment from CAP considered)

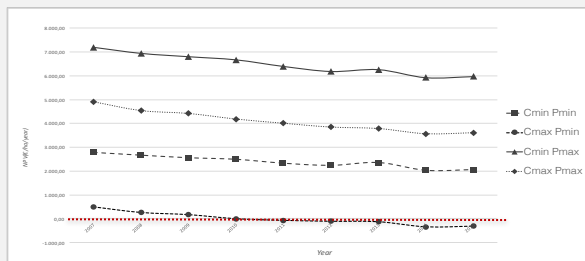
NPV with a 3.5% discount rate, 2007-2015 (real values)



Base-case scenario + subsidies

- Average level of contribution of RDPs of northern Italian regions
- Measure 221 (RDP 2007-13) and Measure 8.1 (RDP 2014-20)
- Increase on average → IRR +2.7 and +3.8%

NPV with a 3.5% discount rate, 2008-2015 (real values)



Poplar in Spain (Duero valley)

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Scientific Visit at EFI Barcelona
(March to May 2017)

CONTEXT AND MARKET OVERVIEW:

- More **recent development** (1970-80s)
- **98,000 ha** estimated in Spain (**50% in the Duero valley**)

SPECIFIC MATERIALS AND METHODS

- 278 trees/ha, 13, 15, 17y **rotations**, MAI= 24.18, 16.72, 11.53 m³/ha/y
- **6 models** → 13_CminPmax, 13_CmaxPmax, 15_CminPavg, 15_CminPavg, 17_CminPmin, 17_Cmin_Pmin
- **Costs data:** FAFCYLE (PFO ass.), SOMACYL
- **Stumpage prices** ← FAFCYLE auctions

Results: Base case scenario

NPV with a 3.5% discount rate for the base case scenario, 1991-2015 (real values)






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Final remarks and next research steps

- Estimations based on **standard management regimes** → evidently cannot represent all the situations
- Results and economic outlook considerations drawn from the research **will contribute**:
 - to discuss the **status of investments in planted forests in southern Europe** and the **implications** in the development of a **bioeconomy**
 - to assess the **correlation between financial profitability and new investments**
- Next steps:
 - **Northern Spain** (radiata pine + maritime pine + eucalyptus)
 - **Portugal** (Eucalyptus + maritime pine)
 - **South-western France** (maritime pine + poplar)
- Towards a **systematic monitoring** of planted forests investments financial returns

Future research challenges

- Include the **growing natural risk component** (wind, fire, pests and diseases ← climate change) in the financial analysis?
- Include in the analysis **future prediction models** (of investments costs and timber prices)

THANK YOU FOR YOUR ATTENTION
Questions or comments?

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