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# Approaches to modelling the supply of skills

Paper presented at *Skillsnet* technical workshop on:  
Forecasting skill supply and demand in Europe

9-10 June 2009, Thessaloniki, Greece

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Researchcentrum voor Onderwijs  
en Arbeidsmarkt

Research Centre for Education  
and the Labour Market

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# Outline

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- Focus on stocks (WAP and EAP)
- Broader coverage
- Improved data: Alphametrics (Phase 1 & 2)
- Modelling : New approaches & methods
- Consistency of the results (activity rates & cohort effect)
- More Detailed ISCED: 3 vs. 7 levels
- New Dimension: Field of study

# Core Data for the first phase (July 2009)

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- Eur27 + Switzerland & Norway
- Time period: 1995-2007
- Broad Educational Attainment Level (ISCED-97)
- Gender
- 5 Year age groups (15-64)

# Under investigation for the 2<sup>nd</sup> phase (December 2009)

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- 1 digit ISCED
- Longer Time – Series

# Additional Detail explored by IER

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- 1 digit ISCED
- Field of Study

These can be modelled using a simple fixed shared approach + experts assessment.

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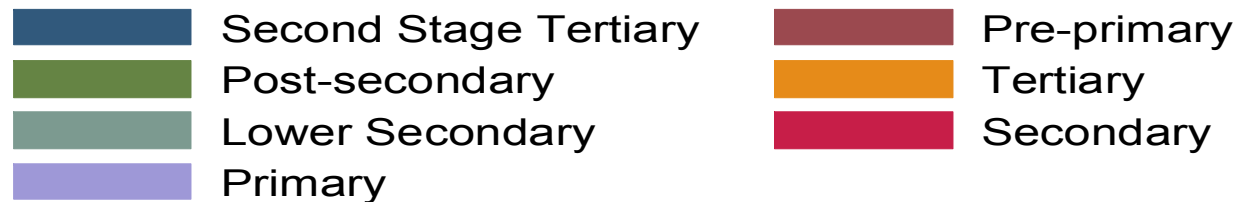
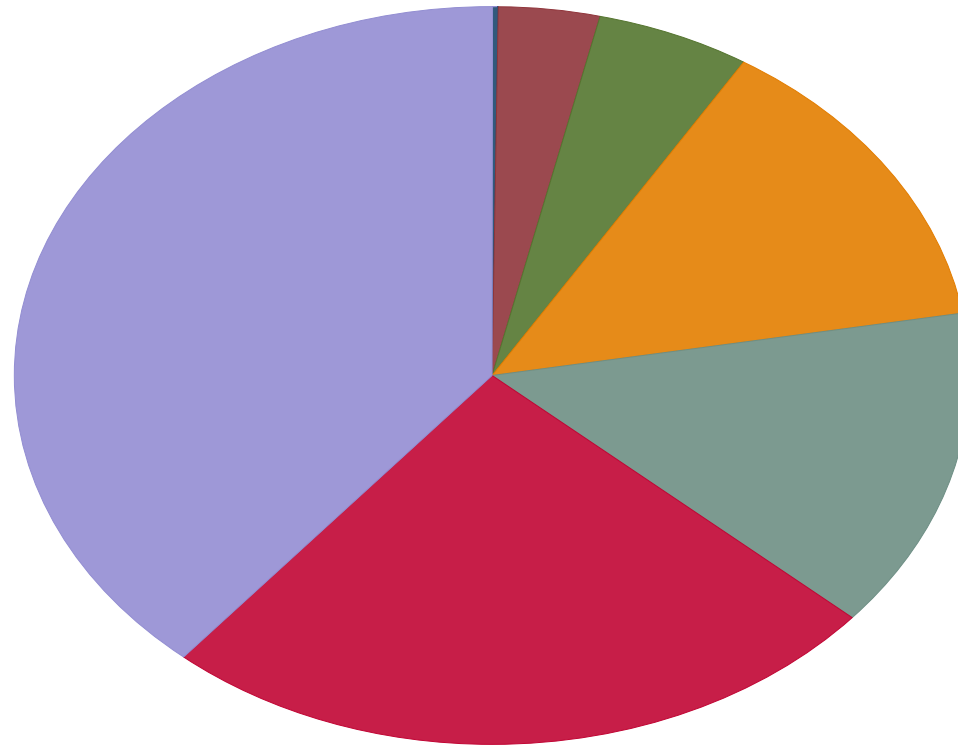
# Classification of educational level

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- **Level 0: Pre-Primary Education;**
- **Level 1: Primary Education or First Stage of Basic Education;**
- **Level 2: Lower Secondary or Second Stage of Basic Education;**
- **Level 3: Upper Secondary Education;**
- **Level 4: Post – Secondary, Non-Tertiary Education;**
- **Level 5: First Stage of Tertiary Education (not leading directly to research qualification);**
- **Level 6: Second Stage of Tertiary Education (leading to research qualification)**

# ISCED 0-6 Greece 2007

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# Fields of study in the LFS

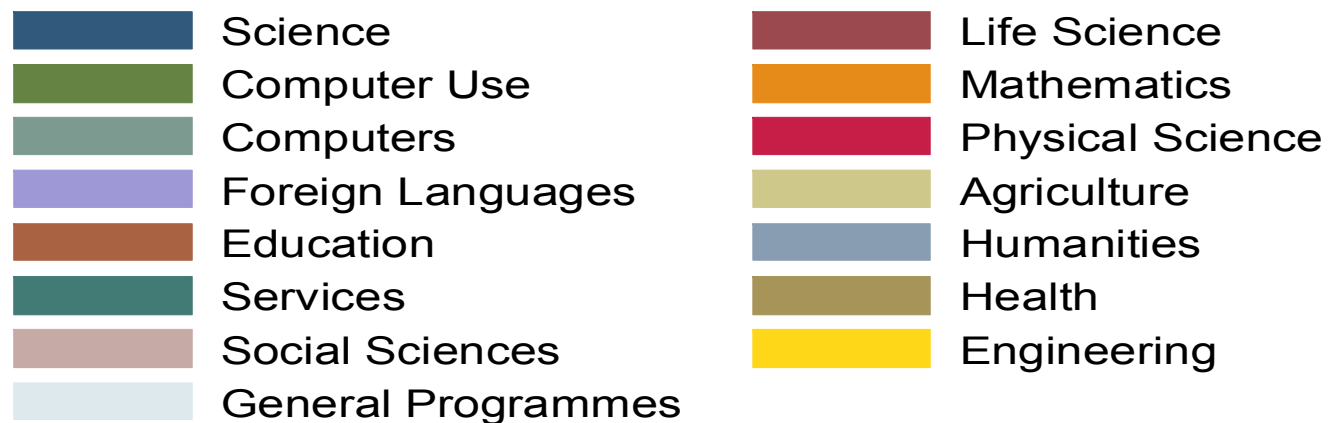
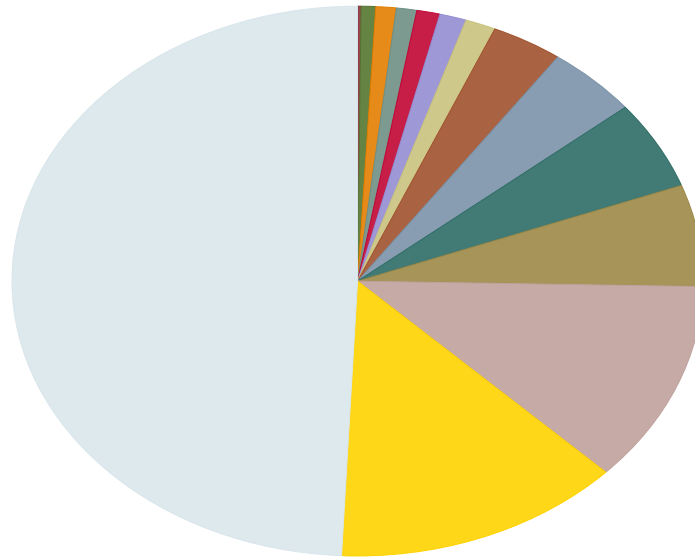
000	<i>General programmes</i>
100	<i>Teacher training and education science</i>
200	<i>Humanities, languages and arts</i>
222	<i>Foreign languages</i>
300	<i>Social sciences, business and law</i>
400	<i>Science, mathematics and computing (no distinction possible)</i>
420	<i>Life science (including Biology and Environmental science)</i>
440	<i>Physical science (including Physics, Chemistry and Earth science)</i>
460	<i>Mathematics and statistics</i>
481	<i>Computer science</i>
482	<i>Computer use</i>
500	<i>Engineering, manufacturing and construction</i>
600	<i>Agriculture and veterinary</i>
700	<i>Health and welfare</i>
800	<i>Services</i>



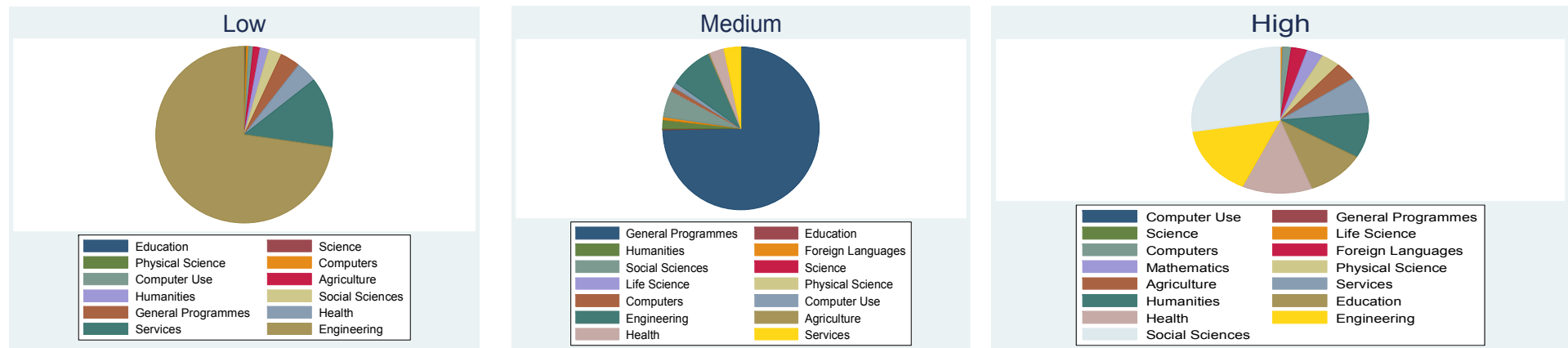
# Fields of Study: GREECE 2007

## Total Population

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# Fields of Study: GREECE 2007 by level of education



# Educational attainment: some theoretical considerations

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- Human capital theory
- GDP growth, public expenditure etc.
- Supply side variables: gender, age, ethnic group, parents' education, family income, parent's occupation, social status
- In practice: severe data limitations (LFS)

# Forecasting qualifications shares

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- Aggregate data from Alphametrics
- Analysis on WAP, EAP
- Consistency of participation rates
- Shares broken down by: Country, Year, Gender, Age
- Extension for ISCED 0-6 & Field of study

# Basic Method

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Logit transformation of the proportions

$$y^* = \log \left( \frac{y}{1-y} \right) = X\beta + \epsilon$$

$y$  = proportion of educational level  $i$

The predictions are then expressed in units of  $y$

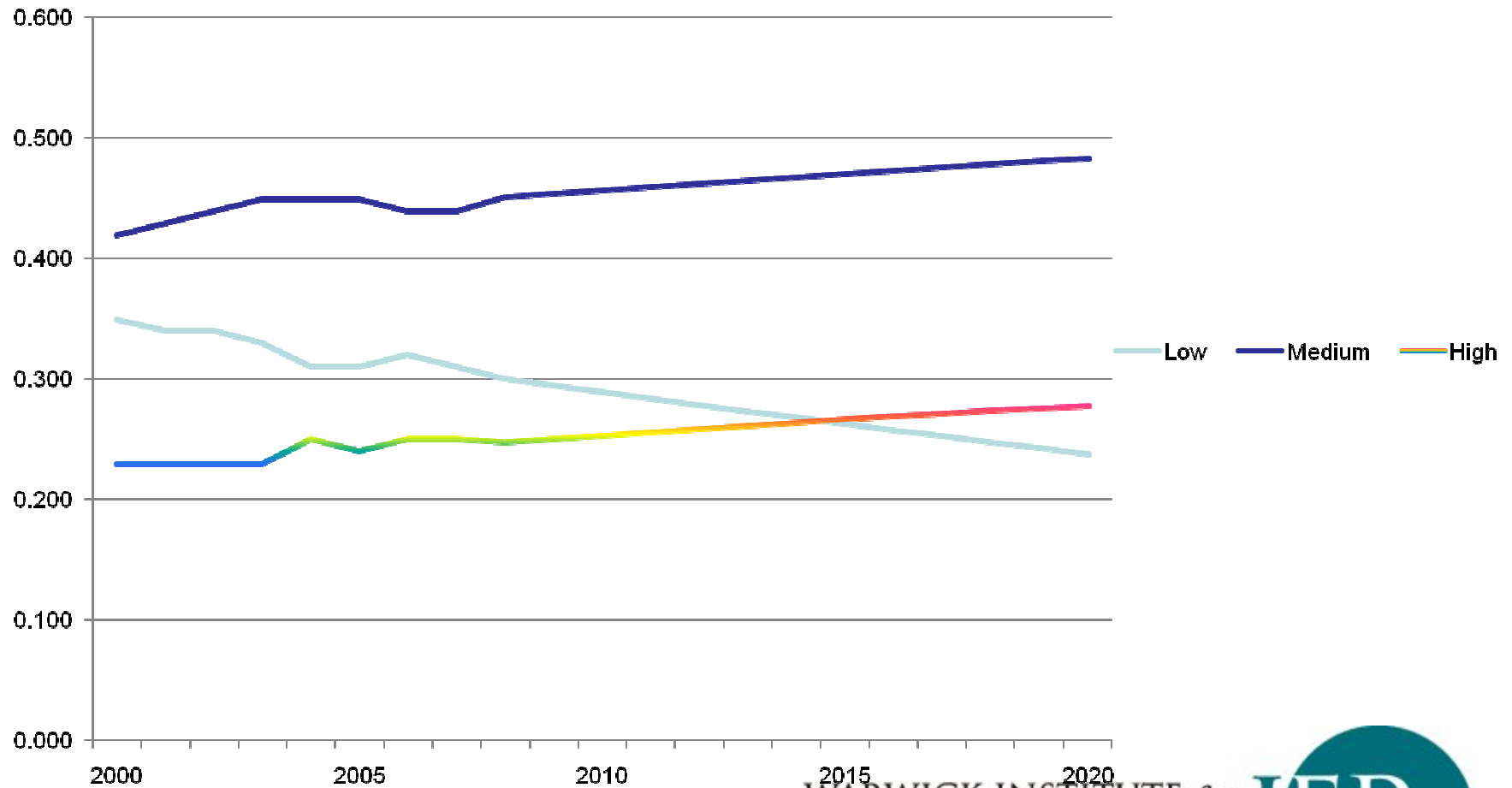
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# Advantages of the logit transformation method

- Values are within the unit interval
- Shares add to 100%
- There is no extreme growth

# Shares of Educational Attainment Greece Males 30-39



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# Looking for common patterns

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- Analysis on panel data, pooling together all data, will be explored.
- Purpose: to identify common patterns across countries, and age & gender categories



# LFS variables that can be included in the analysis

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- Income information
- Rates of unemployment by educational attainment

# Other variables to be explored

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- Public expenditure on education (% GDP)
- Private expenditure on education (% GDP)
- Financial aid to students

# Other issues to be addressed

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- Consistency of Participation Rates by level of educational attainment
- The Cohort Effect
- Consistency with the demand side

# Conclusions

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- Data issues: resolution of gaps & discontinuities
- Behavioural element
- New dimensions
- Greater level of detail
- Consistency of results