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38th Annual EAEPE Conference
Employability and vocational training under the EQAVET framework: conceptual framework and empirical evidence

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THE ISSUE AT STAKE

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The Measurement Challenge of EQAVET Indicators

EQAVET provides a comprehensive monitoring framework, but empirical evaluation faces important data limitations

To evaluate whether training provision influences outcomes, it is necessary to link:

✓ individual learners

✓ training programmes attended

✓ training providers

✓ support services received

✓ subsequent labour market outcomes

THE CONCEPTUAL FRAMEWORK

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EQAVET indicators can be interpreted as a logical chain linking initial conditions, training processes, and final outcomes.

Inputs / System Conditions: Indicators 1, 2, 3, 7, 8, 9, 10

These indicators measure:

- Quality of training provision
- Participation, inclusion, support services
- Skills and training needs
- Labour market context

Outputs / Final Results: Indicators 5 and 6

These indicators measure:

- Employment outcomes
- Use of acquired skills by learners

10 EQAVET indicators to assess the quality of vocational education and training

•Indicator 1: Relevance of quality assurance systems for VET providers
•Indicator 2: Investment in training of teachers and trainers
•Indicator 3: Participation rate in VET programmes
•Indicator 4: Completion rate in VET programmes
•Indicator 5: Placement rate of graduates from VET programmes
•Indicator 6: Utilisation of acquired skills at the workplace
•Indicator 7: Unemployment rate in the country
•Indicator 8: Prevalence of vulnerable groups
•Indicator 9: Mechanisms to identify training needs in the labour market
•Indicator 10: Schemes used to promote better access to VET and provide guidance to (potential) VET learners

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<u>However, available data sources are fragmented</u>

The Ideal Dataset: Linking Individuals, Courses, Providers, Services, and Outcomes

The first-best solution would consist of an integrated micro-level dataset in which each former learner is linked to:

- The training programme attended
- The training provider and location
- The services available and actually used
- Subsequent educational and labour market outcomes

The First-Best Solution Is Not Available

- The necessary information exists, but it is distributed across different data sources

EQAVET indicators can be measured separately, but assessing the relationship between training provision and learner outcomes requires methodological solutions to overcome data fragmentation.

Research question: How can EQAVET indicators be used for evaluation when the ideal micro-level linkage is not available?

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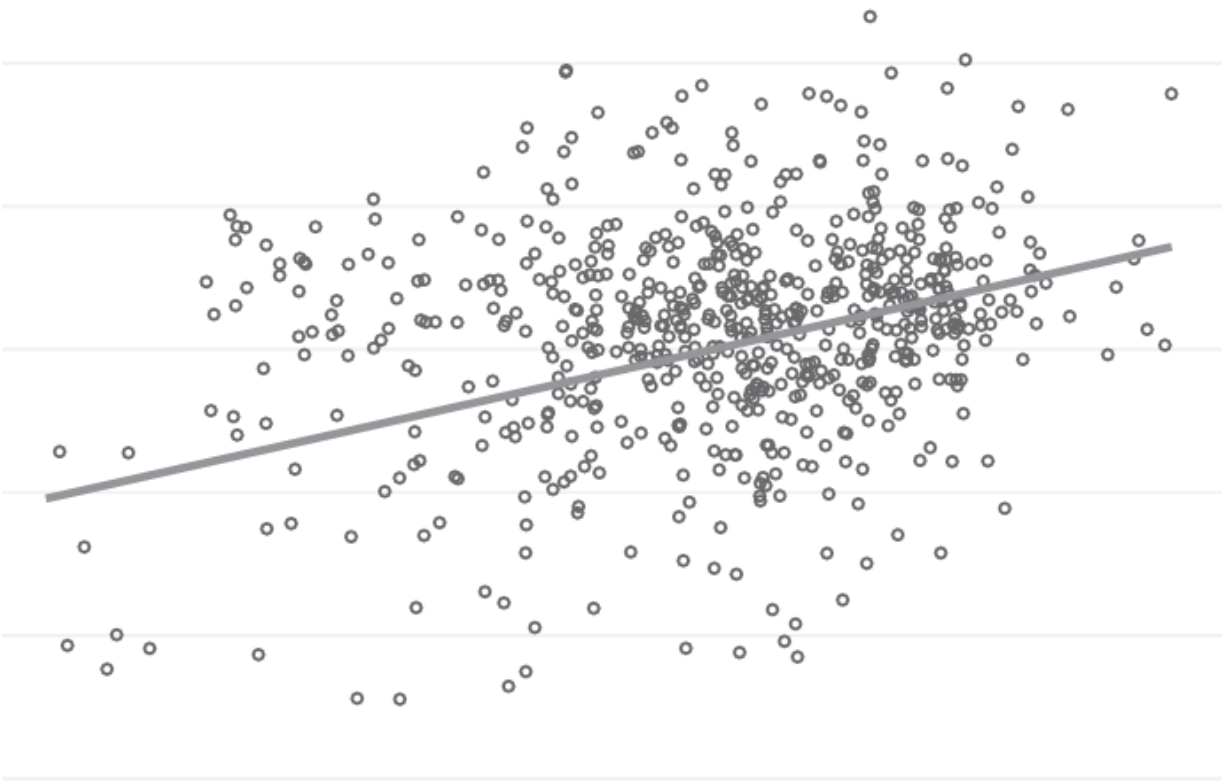
Some policy wise Quantitative Options: socio economic geography and multivariate analysis



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Territorialising Supply-Side Variables

- Since individuals cannot be directly linked to training providers, information is aggregated to a common geographical scale.
- The **geographical unit** becomes the unit through which training supply variables are integrated and analysed.

Main trade-off:

- **First-best:** higher analytical precision but unavailable in most administrative systems.
- **Second-best:** less precise but allows EQAVET indicators from different sources to be integrated and used for territorial evaluation.

DATA SOURCES (EXAMPLE)

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- **OFP Survey (Survey of Training Providers).**

The OFP Survey provides information on the organisational and operational characteristics of vocational education and training providers. It includes data on accreditation, staff training and professional development, learner participation, the presence of vulnerable groups, mechanisms used to identify labour market training needs, and the availability of guidance and support services. These data are used to construct territorial proxies for EQAVET Indicators 1, 2, 3, 8, 9 and 10.

- **Outcomes Surveys of IeFP and IFTS Graduates.**

The Outcomes Surveys collect information on former learners after the completion of their training pathways. They provide evidence on employment status, labour market transitions, and the extent to which acquired skills are utilised in the workplace. These surveys are used to construct the outcome dimensions of the EQAVET framework, namely Indicator 5 (placement rate) and Indicator 6 (use of acquired skills at work).

QUANTIFICATION ISSUES

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EQAVET Indicator	Dimension	Empirical proxy	Data source
Indicator 1	Training provision	Accredited providers per 100,000 inhabitants	**OFP Survey**
Indicator 2	Investment in trainers and teachers	Share of providers investing in staff training and professional updating	**OFP Survey**
Indicator 3	Participation in VET programmes	Learners enrolled per 100,000 inhabitants	**OFP Survey**
Indicator 5	Placement rate	Share of former learners employed after training	**IeFP / IFTS Outcomes Surveys**
Indicator 6	Utilisation of acquired skills at the workplace	Share of former learners reporting that acquired skills are used in their job	**IeFP / IFTS Outcomes Surveys**
Indicator 8	Prevalence of vulnerable groups	Vulnerable learners per 100,000 inhabitants	**OFP Survey**
Indicator 9	Mechanisms to identify training needs in the labour market	Share of providers adopting needs-based planning mechanisms	**OFP Survey**
Indicator 10	Schemes used to promote better access to VET	Availability of guidance, orientation and support services	**OFP Survey**

QUANTIFICATION ISSUES

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The Role of Provinces in the Italian VET System

- **The province is a meaningful territorial unit for vocational education and training in Italy**
- Although learners cannot be directly linked to training providers, both data sources can be connected through the province where training takes place.
- **Why provinces?**
- Training providers operate within local labour markets that are largely organised at the provincial level.
- The availability of support services, guidance activities, and employer networks tends to be geographically concentrated.
- Provincial territories capture differences in training provision, institutional capacity, and labour demand.
- Both the OFP Survey and the Outcomes Survey contain information that can be consistently assigned to provinces.
- **What does the provincial approach capture?**
- **The province acts as a proxy for the local training ecosystem**, combining providers, support services, institutional capacity, and labour market opportunities into a common analytical framework.

Some mapping visualizations

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Indicator 1 – Accredited Providers per 100,000 Inhabitants

What does it measure?

- A proxy for the territorial availability of formally accredited VET providers. It captures the institutional density of the training system.

Strengths

✓ Measures the territorial presence of **accredited** training providers.

✓ Easy to compare across territories through population normalisation.

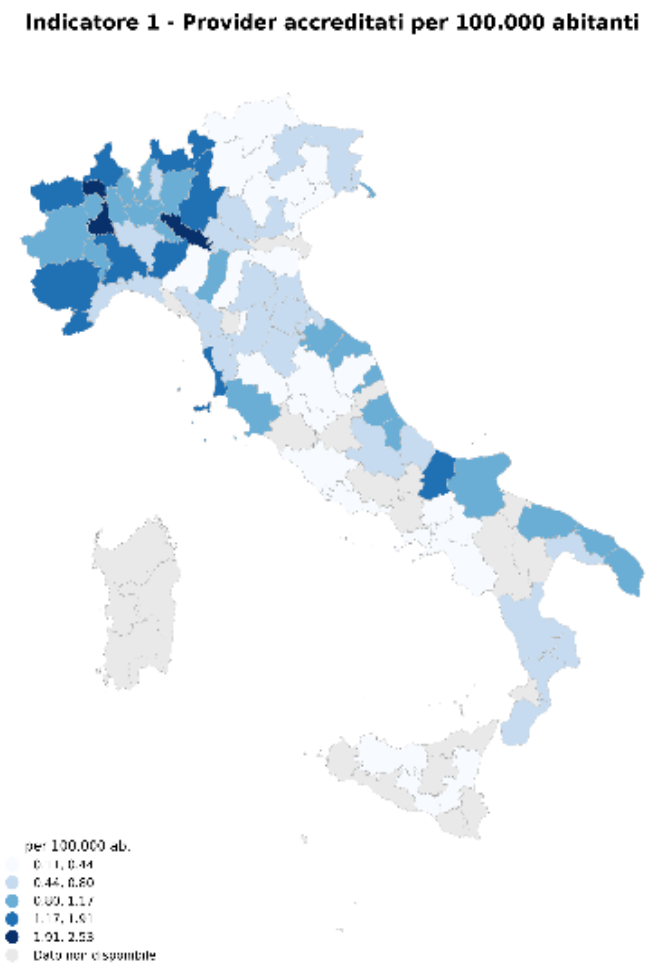
✓ Captures an important structural dimension of training supply.

Limitations

✕ Measures quantity, not quality, of providers.

✕ Does not account for provider size or capacity.

✕ Missing data in some provinces may affect comparability.



Some mapping visualizations

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Indicator 2 – Staff Training and Professional Updating

What does it measure?

- The extent to which providers invest in the training and updating of teachers and staff.

Strengths

✓ Directly linked to human capital development within providers.

✓ Reflects organisational commitment to quality improvement.

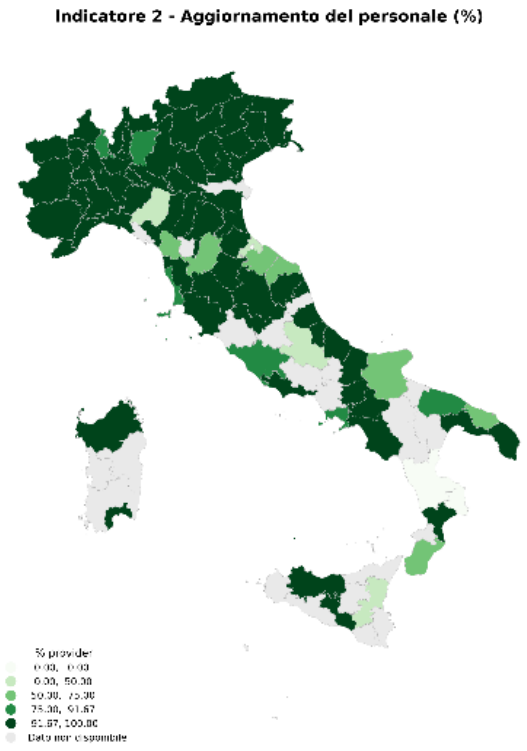
✓ Closely aligned with EQAVET objectives.

Limitations

✕ Very limited territorial variation.

✕ Difficult to distinguish high-performing from average territories.

✕ Measures the presence of training, not its quality or intensity.



Some mapping visualizations

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Indicator 3 – Learners per 100,000 Inhabitants

What does it measure?

- Participation intensity in IeFP and IFTS programmes relative to the population.

Strengths

✓ Captures actual utilisation of VET provision.

✓ Reflects both supply capacity and demand for training.

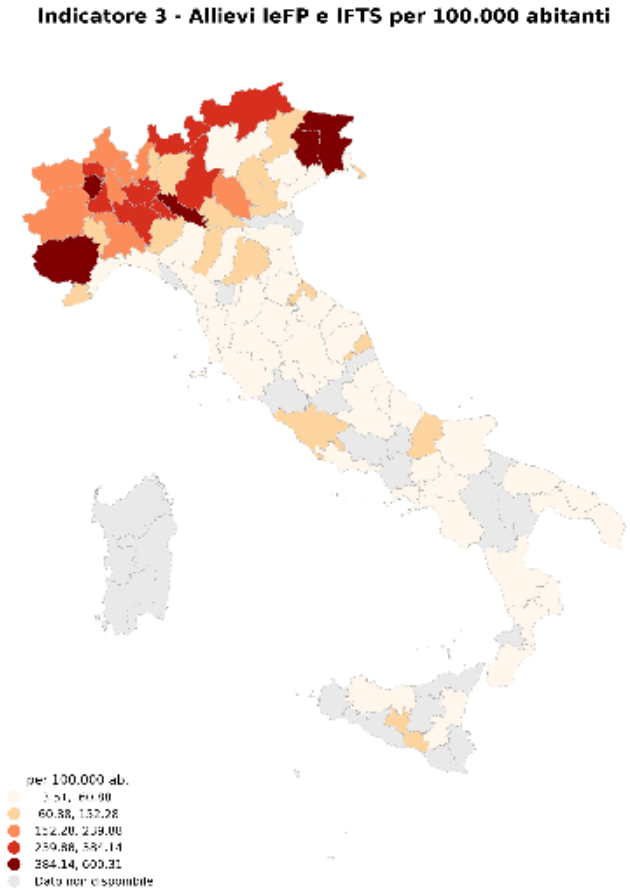
✓ One of the most territorially informative indicators.

Limitations

✕ Difficult to disentangle supply-side and demand-side effects.

✕ May reflect labour market conditions rather than training quality.

✕ Population normalisation does not account for differences in target-age cohorts.



Some mapping visualizations

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Indicator 6 – Use of Acquired Skills at Work

What does it measure?

- The extent to which former learners report using the competencies acquired during training in their current job.

Strengths

✓ Captures the qualitative dimension of labour market integration.

✓ Measures training-job coherence.

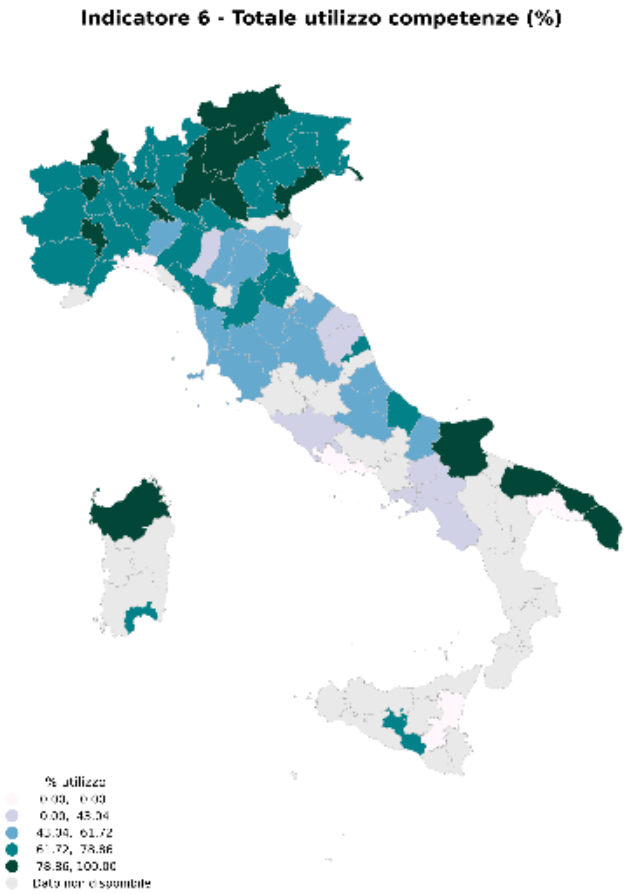
✓ More informative than employment alone.

Limitations

✕ Based on self-reported information.

✕ Subject to perception bias.

✕ May vary according to occupational composition across territories.



Some mapping visualizations

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Indicator 8 – Vulnerable Learners per 100,000 Inhabitants

What does it measure?

- The participation of vulnerable groups within the VET system.

Strengths

✓ Captures an important inclusion dimension.

✓ Allows assessment of the system's ability to reach disadvantaged groups.

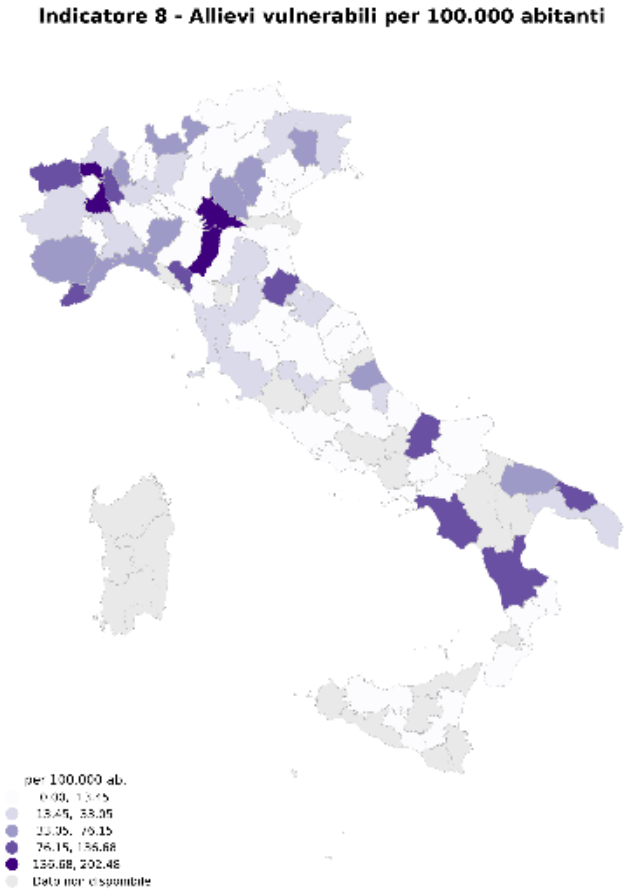
✓ Relevant for equity-oriented evaluation.

Limitations

✕ Interpretation is ambiguous.

✕ High values may indicate either greater vulnerability or better inclusion.

✕ Should be analysed jointly with outcome indicators.



Some mapping visualizations

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Indicator 9 – Training Needs Identification Mechanisms

What does it measure?

- The extent to which providers use structured mechanisms to identify labour market and skills needs when planning training provision.

Strengths

✓ Closely connected to the strategic dimension of EQAVET.

✓ Measures alignment between training supply and labour market needs.

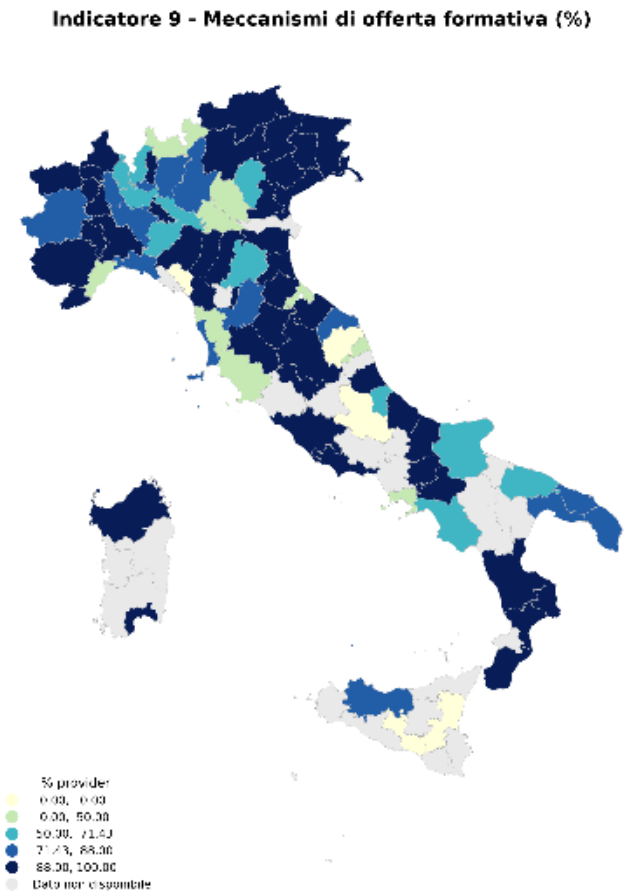
✓ Reflects organisational quality.

Limitations

✕ Limited territorial variability.

✕ Captures existence rather than effectiveness of planning mechanisms.

✕ Potentially weak explanatory power in empirical models.



TOWARDS A MULTIVARIATE EMPIRICAL SETTING (WITH A FOCUS ON GEOGRAPHY)

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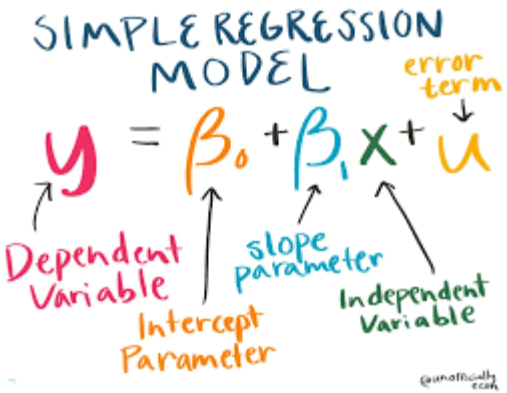
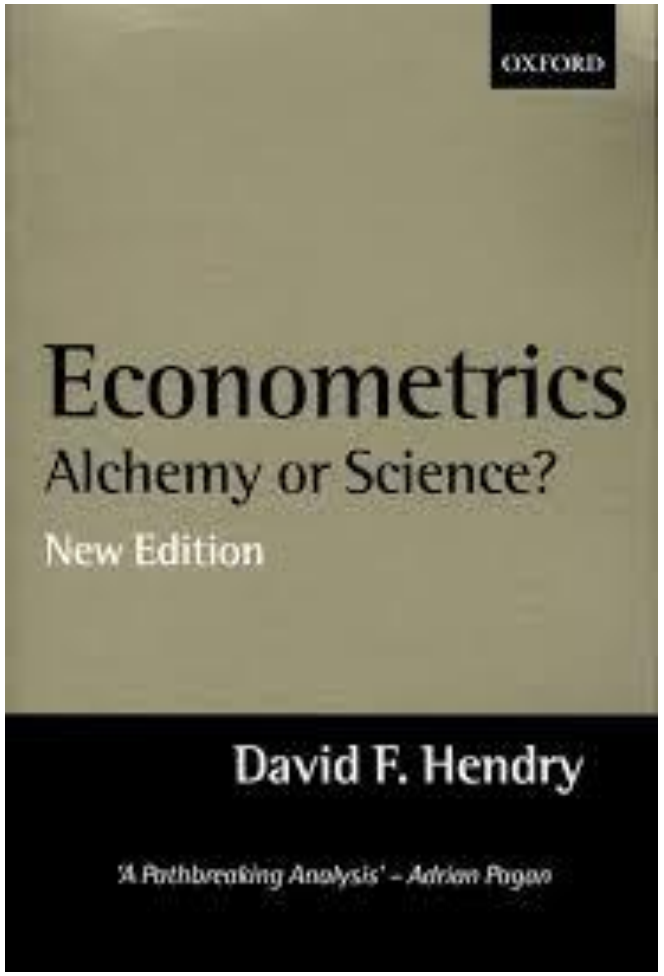


Aim: setting up a conceptual framework for setting empirical models based on EQAVET indicators, with the aim of implementing a multivariate statistical analysis, capable of linking the characteristics of the training and the territory offering with the outcomes, namely employability and quality of the employment (coherence).

As far as datasets are concerned, the central methodological choice is to propose a "dialogue" between two INAPP sources that respond to complementary knowledge purposes. On the one hand, the Survey on the Offer of Professional Training (OFP) describes the accredited facilities and their organization, On the other hand, the Survey on the employment outcomes detects, at individual level, employment conditions and qualitative assessments (satisfaction, coherence between training and work, use of skills).



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The Cult of Statistical Significance: How the Standard Error Costs Us Jobs, Justice, and Lives

Preface and Table of Contents

By Stephen T. Ziliak and Deirdre N. McCloskey
University of Michigan Press, 2007
© Stephen T. Ziliak and Deirdre N. McCloskey 2006

Front Matter

McCloskey and Ziliak, internationally known as critics of econometrics and of statistical practice in other sciences, have long followed Gosset and Neyman and Pearson and others in arguing that fit without an explicit loss function is meaningless as a criterion of "importance." Acknowledgment of the criticism would radically improve decision-making in medicine, economics, biology, psychiatrry, pharmacology, psychology, criminal justice, and other fields.

"The History of Science has suffered greatly from the use by teachers of second-hand material, and the consequent obliteration of the circumstances and the intellectual atmosphere in which the great discoveries of the past were made. A first-hand study is always instructive, and often . . . full of

The Cult of Statistical Significance: Preface and table of contents

"The Cult of Statistical Significance", Stephen Ziliak & DNM, *JSM* 2009, Section on Statistical Education: 2302-19. (This is the 2nd-most downloaded article on StatLit.)

On its influence in the US Supreme Court decision regarding statistical significance

"Brief for Statistics Experts Professors Deirdre M. McCloskey and Stephen T. Ziliak in Support of Respondent" before the US Supreme Court, Matrixx v Siracusano, Nov 12, 2010, No. 09-1156, oral argument, Jan 10, 2011

"Making a Stat Less Significant," Carl Bialik, *Wall Street Journal*, 2 Apr. 2011

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Using Innovations Surveys for Econometric Analysis

Jacques Mairesse & Pierre Mohnen

WORKING PAPER 15857 **DOI** 10.3386/w15857 **ISSUE DATE** April 2010

After presenting the history, the evolution and the content of innovation surveys, we discuss the characteristics of the data they contain and the challenge they pose to the analyst and the econometrician. We document the two uses that have been made of these data: the construction of scoreboards for monitoring innovation and the scholarly analysis of various issue related to innovation. In particular we review the questions examined and the results obtained regarding the determinants, the effects, the complementarities, and the dynamics of innovation. We conclude by suggesting ways to improve the data collection and their econometric analysis.

Econometric strategies using survey based data

Cross section

- Use of Instrumental variables (for endogeneity)
- Semi non parametric analysis (more flexible)
- Panel data – where T=2 periods is optimal!

Empirical Economics (2025) 68:327–352
https://doi.org/10.1007/s00181-024-02634-8

Modelling green knowledge production and environmental policies with semiparametric panel data regression models

Antonio Musolesi[1] · Davide Golinelli[1] · Massimiliano Mazzanti[1]

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Abstract
This paper introduces a novel semiparametric econometric framework for policy evaluation and estimates a green knowledge production function for a large, 30-year panel dataset of high-income countries. Due to the substantial uncertainty in the data-generating process and the potential presence of nonlinearities and latent common factors, the paper explores semiparametric panel specifications that go beyond interactive fixed effects fully parametric models. The findings suggest that (i) the semiparametric additive specification with individual time trends is the preferred model, (ii) threshold effects and nonlinearities are salient features of the data that parametric specifications fail to capture, and (iii) the impact of environmental policy is noteworthy and exhibits clear heterogeneity when modelled as a nonparametric function of specific knowledge inputs. The evidence reveals a significant nonlinear policy inducement effect stemming from R&D investments.

A CONCEPTUAL INPUT–PROCESS–OUTPUT MODEL FOR EQAVET

To make EQAVET analytically operational, it is necessary to develop a conceptual model that clarifies the expected links between policies, training processes, and outcomes. The goal is to systematically link the ten EQAVET indicators to input, process, and output variables, making the system's operating mechanism transparent.

Inputs (indicators 1, 2, 3, 7, 8, 9, 10): Inputs represent factors that influence training outcomes before and during the delivery process. They include:

- *quality assurance and accreditation systems;*
- *investment in trainer training and continuing education;*
- *participation and intensity of training programs;*
- *local labor market conditions;*
- *inclusion of vulnerable groups;*
- *needs analysis mechanisms;*
- *access systems and guidance services.*

Final Outputs (Indicators 5 and 6)

Job Placement: a predominantly quantitative dimension, measurable through employment rates and contractual quality.

Use of Skills: a qualitative dimension, linked to the match between acquired skills, tasks performed, and job satisfaction.

Together, these outputs define the effectiveness of training in terms of employability and skills adequacy.

SOME VERY PRELIMINARY RESULTS LINKING THE GEOGRAPHICAL AND MULTIVARIATE SETTINGS….

The results do not support a uniform relationship across territories.

In the pooled sample and in the North, the two provincial outcome indicators are not robustly associated with either outcome.

In the Centre-South, support services are positively associated with employment.

In the corresponding satisfaction model, both institutional planning and support services are positively associated with graduate evaluations of the programme

Discussion – Conclusions

- Attempt to set a conceptual model for policy based empirical evidence
- Assessing the strenghts and weaknesses of an outcomes – inputs model
- Assessing the strenghts and weaknesses of an multivariate analysis (not the only way but relevant)
- Integrating survey datasets and exploiting territorial heterogeneity

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Thank you for your attention!

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