

Training Course

How to use Labour Market Intelligence

Module 4

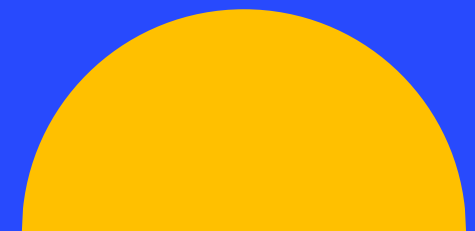
LMI capabilities for employability

Impact and outcomes for policy makers



Funded by
the European Union

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Introduction

This course explores the dynamic capabilities of Labor Market Information (LMI) and its crucial role in boosting employability outcomes.

The primary goal is to empower Higher Education Institutions (HEIs) with a deep understanding of LMI and facilitate the use of LMI in evidence-based policymaking within these institutions.

This approach is designed to bridge the gap between academic curricula and the evolving needs of the labour market, ensuring that the education provision is directly aligned with current and future job market demands.

Through this alignment, HEIs can enhance the employability of their graduates, making them well-equipped to meet the real-world challenges and opportunities of the labour market.



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Lessons 3: Developing LMI Capabilities for Policymakers

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Training outline

Lesson 1

ROLE OF LMI IN EMPLOYABILITY

Understanding the role of LMI in employability and workforce development

Lesson 2

LMI TO ENHANCE EMPLOYABILITY

Identifying skills needs and emerging trends in the labor market using LMI

Lesson 3

LMI CAPABILITIES FOR POLICYMAKERS

Use real-time LMI to adapt policies in response to changing labor market conditions

Lesson 1: Understanding the Role of LMI in Employability and Workforce Development



Objectives:



Provide a foundational understanding of what LMI is, including its sources, types, users and basic principles.



Explore how LMI is utilised in policy development, illustrating its impact on shaping effective workforce and educational policies, and addressing the needs of the labor market.



Highlight the critical role of LMI in making informed decisions for individuals, businesses, and organisations.

What the LMI is?

Labour market intelligence (LMI) is the process of collecting, analysing, and interpreting data about the labour market in order to inform decision-making.

Labour market information is raw data about the labour market, while labour market intelligence is data that has been processed and analysed.

Labour market information can be used to inform decision-making, but it must first be transformed into labour market intelligence.

Example of LMI



What do people do in a job/industry?



How many people work in this job/industry?



What qualifications do I need for this job/industry?



How much do people get paid to do this job?



What skills and qualities do I need for this job?

Labour market information/Labour market intelligence



What are the typical working hours for this job/industry?



What percentage of men and women work in this job/industry?



Where can this job/industry take me in the future?



Where are the jobs located around the country?



How many of these jobs will there be in the future?

Key components of LMI in the context of employability

Labor Market Data: Comprehensive and accurate data on employment rates, job openings, and workforce demographics forms the foundation of Labour Market Intelligence.

Job Market Trends: Analysis of job growth, emerging industries, and changing job roles provides valuable insights into the evolving employment landscape.

Skills Gap Analysis: Assessment of the misalignment between the skills possessed by the workforce and those demanded by employers, highlighting areas for targeted training and development.

Industry Insights: Understanding the specific requirements of different industries, including technological advancements, market demands, and talent needs, to inform tailored interventions and workforce development strategies.

The importance of LMI for informed decision-making

The primary function of LMI is the generation of data and analyses tailored for policymakers and other labor market stakeholders.

LMI is an essential instrument for evidence-based policymaking.

Enables policymakers to make well-informed decisions that are instrumental in fostering employment opportunities, enhancing workforce competencies, and driving economic growth.

Ensuring that labor market policies are not only reactive but also proactive in addressing the dynamic needs of the economy.

How LMI can inform decision-making?

LMI plays a pivotal role in employability and workforce development, serving as a key resource for various stakeholders, including job seekers, educators, employers, and policymakers.

Here's how LMI contributes to these areas:



Government

*Ensure health of economy
Make policies
Asses the policies impact*



Individuals

*Determine skills required
Career planning
Info about occupation dynamics*



Labour market agencies

*Provide information to employers
Provide information to jobseekers
Plan services for clients*



Employers

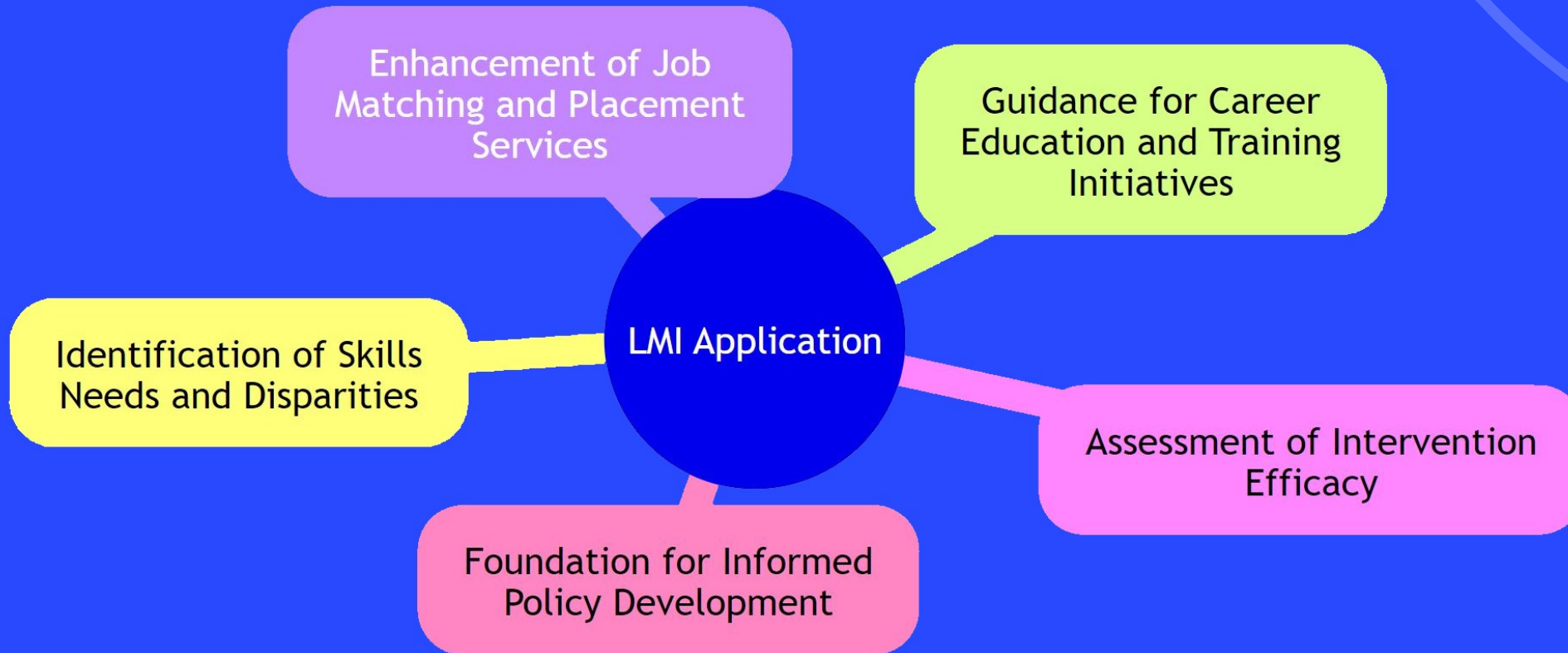
*Determine appropriate wages & benefits
Assess the quality & quantity of labour
Assess economic condition for future plans*



Education and Training provision

*Determine programs and curricula
Determine demand by occupation
Develop the career services*

Applications of LMI in policy development



Examples

The European Commission's Employment and Social Policy Directorate-General (DG EMPL) uses LMI to inform its policies on education, training, and employment. The DG collects and analyzes data on labor market trends, skills needs, and employment outcomes to develop evidence-based policies.

The European Centre for the Development of Vocational Training (CEDEFOP) uses LMI to identify skill gaps and emerging trends in the labor market, and to develop guidelines for VET providers.

According to LMI-EUniv project survey, about 59% of HEI in EU use LMI to develop curricula.

Lesson 2: Harnessing LMI to Enhance Employability Outcomes

Objectives:



Educate HEIs on how to analyse and interpret LMI data to understand industry trends and emerging skill demands.



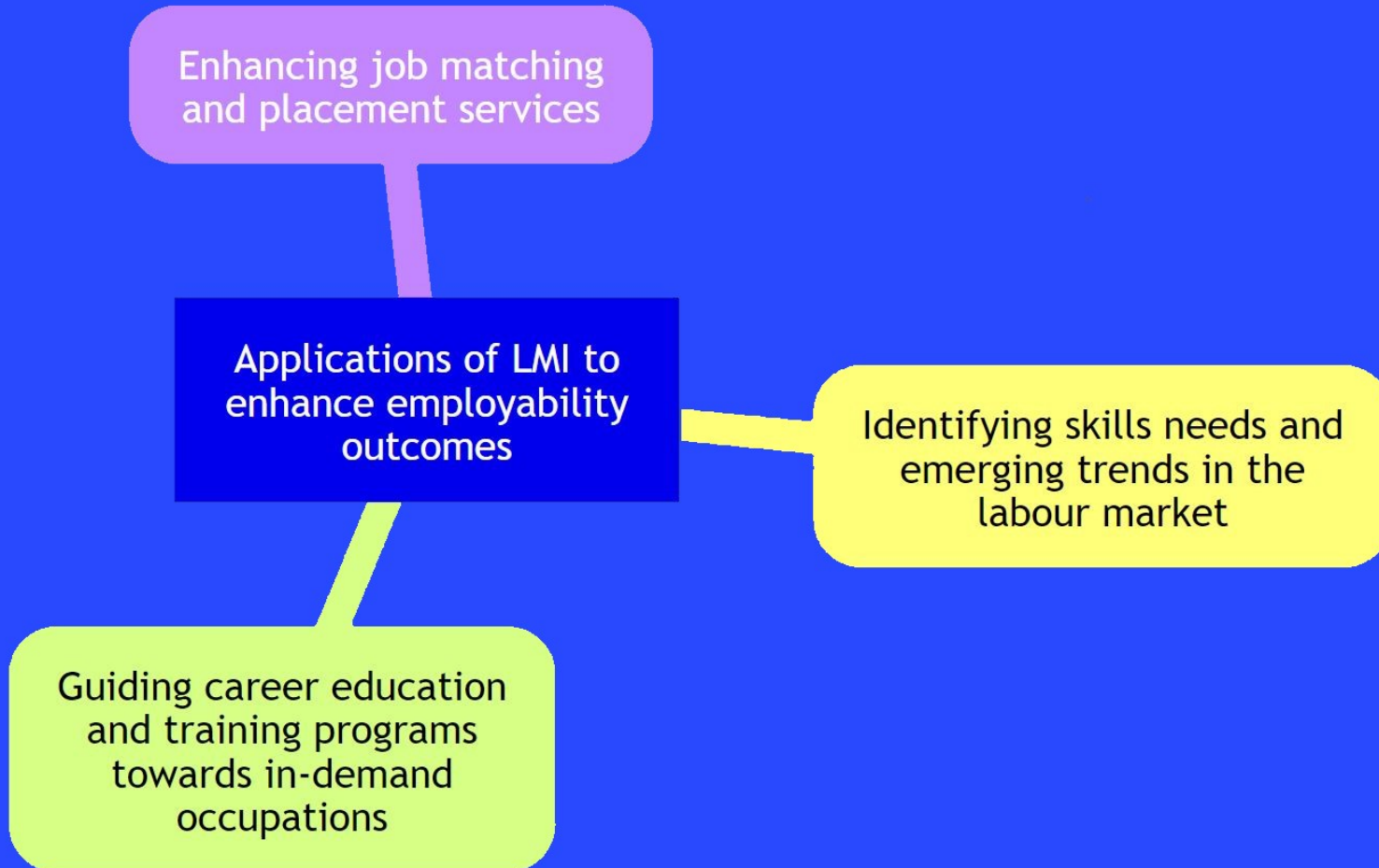
Provide frameworks for HEIs to integrate LMI insights into curriculum development and program design.



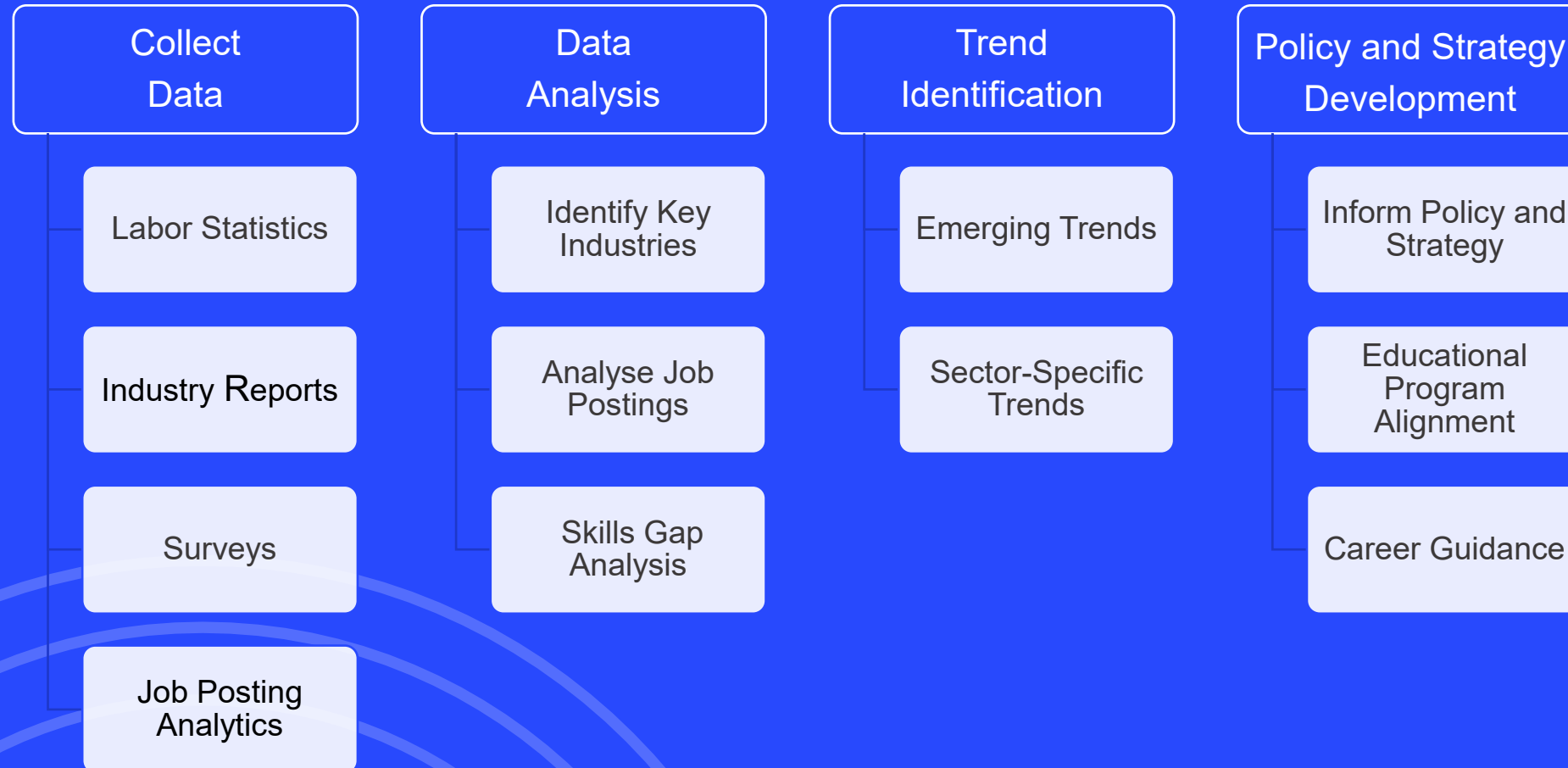
Train HEI career services staff to utilize LMI for enhancing job matching and placement strategies.



Applications of LMI to enhance employability outcomes



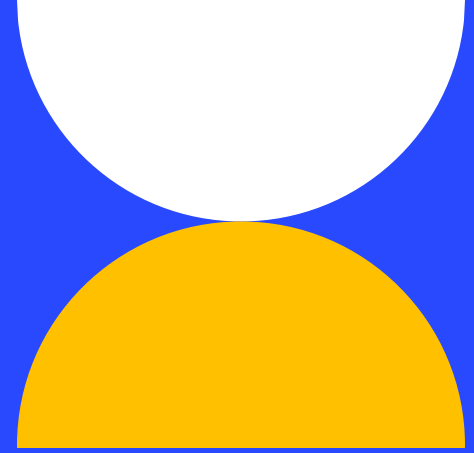
Key stages



Identifying skills needs and emerging trends in the labour market using LMI

Identifying skills needs and emerging trends in the labor market using Labor Market Information and Intelligence involves analysing current and future job market data to understand which skills are in high demand and which industries are growing or evolving.

How to... ...identify skills needs



Guiding career education and training programs towards in-demand occupations based on LMI insights

Guiding career education and training programs towards in-demand occupations based on LMI insights involves using LMI to align educational and training programs with the current and future needs of the job market. It focuses on ensuring that the skills and knowledge imparted to students and trainees are relevant and in high demand.

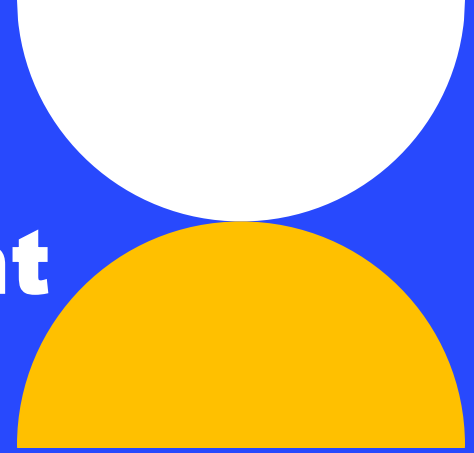
How to... ... guide career education and training...



Enhancing job matching and placement services through effective utilisation of LMI

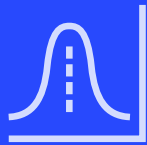
This concept focuses on using LMI to improve the process of connecting job seekers with appropriate employment opportunities. It involves understanding the dynamics of the job market and the specific needs of employers to facilitate better job placements.

How to... ...enhance job matching and placement services

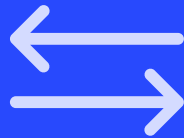


Lessons 3: Developing LMI Capabilities for Policymakers

Objectives:



Understanding the strengths and limitations of different data sources, such as government statistics, private sector data, and real-time labor market data



Equip policymakers with the knowledge to assess how advancements in technology, such as big data analytics, machine learning, and artificial intelligence, are transforming the landscape of labor market information

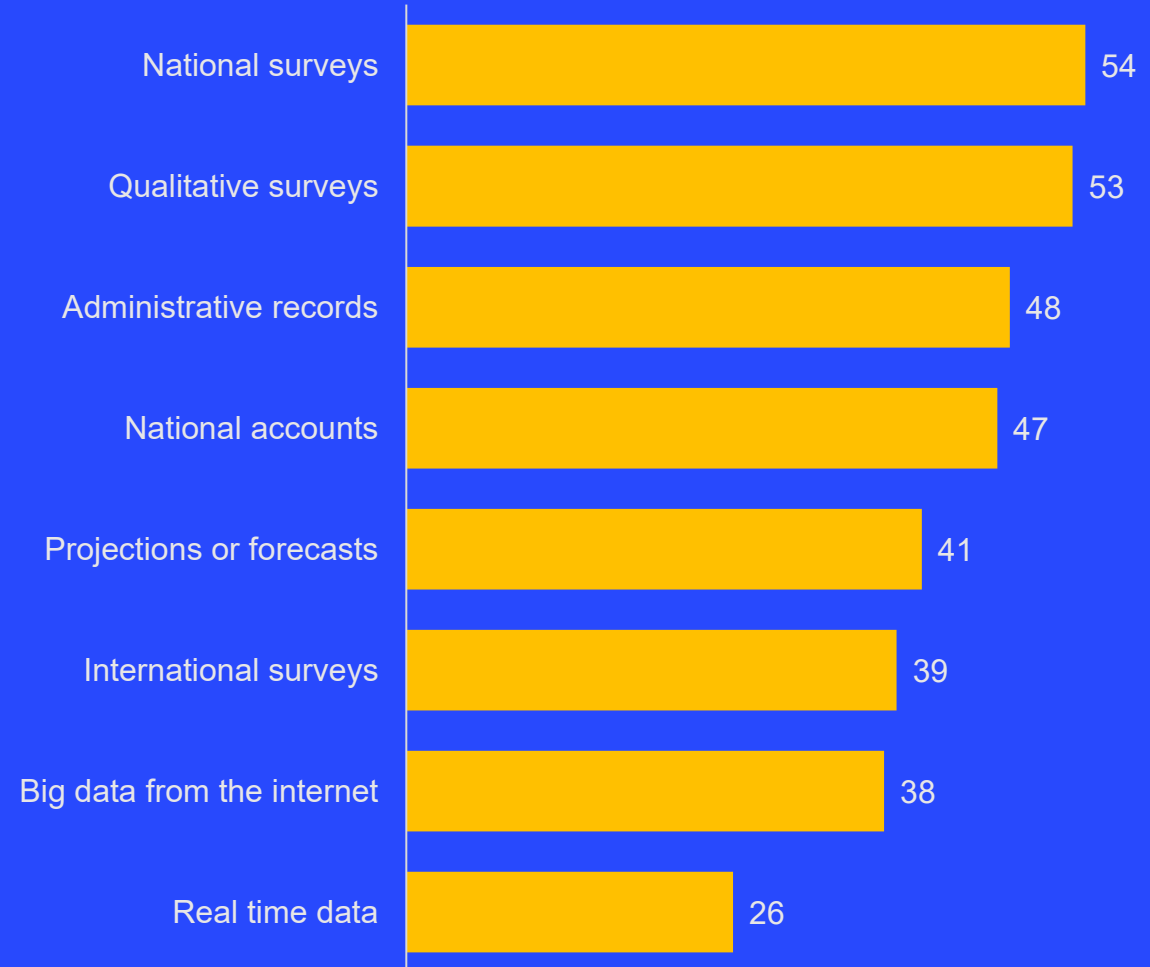


Training policymakers to effectively use AI-driven platforms and tools for analysing and interpreting labor market information



LMI sources

From traditional government reports to real-time data analytics, LMI sources have expanded, offering richer, more timely insights into labor market dynamics.



Source: LMI-EUniv Survey

Traditional vs. Emerging LMI Sources

Traditional and new LMI sources have distinct roles in labor market analysis.

Traditional sources offer a reliable, standardised, and comprehensive view of the labor market over time, but they may lack the immediacy and detail of new sources.

New sources, provide real-time, granular insights, but they may require more sophisticated tools for analysis and could be subject to biases.

New LMI Sources

Real-Time Insights

Specificity and Granularity

Innovative Analysis

Quality and Reliability Concerns

Complexity in Analysis

Potential Biases

Traditional LMI Sources

Reliability and Standardization

Longitudinal Data

Wide Coverage

Time Lag

Limited in Scope

Lack of Granularity

Emerging Technologies in LMI

Emerging technologies are revolutionizing how we gather, analyze, and interpret labor market data, offering unprecedented insights into workforce dynamics.

Artificial Intelligence



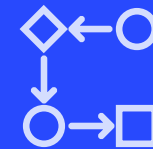
Powering Advanced
Analysis and
Decision-Making

Big Data



Transforming Vast
Data Sets into
Valuable Insights

Machine Learning



Evolving Intelligence
through Data

Integrating Advanced Technologies in Labor Market Analysis

Advanced technologies are key drivers in transforming labor market analysis, offering new perspectives and deeper insights into workforce dynamics.



Benefits of Using New Technologies in LMI Analysis

Before TECH

Manual Data Collection

Basic Data Analysis

Infrequent, Delayed Reporting

Generalised Market Insights

Transition To



After TECH

Automated, Diverse Data Aggregation (AI, Big Data)

Advanced Analytics (Machine Learning)

Real Time, Continuous Reporting

Precise, Predictive Market Insights

Importance of Diverse LMI for Policymaking



Examples of new technologies

IBM Watson Talent Management

Watson analyzes job market data and trends to help companies identify the skills they need. It also predicts future skills requirements and helps in workforce planning.

Google Cloud Talent Solution

It uses machine learning to understand jobseeker preferences and skills, matching them with relevant job opportunities.

LinkedIn's Economic Graph

By applying AI and machine learning algorithms to this data, LinkedIn can identify emerging job market trends, skills in demand, and workforce gaps.

Burning Glass Technologies

Their AI-driven platform analyses hundreds of millions of job postings and real-time labor market data to identify emerging trends and skills.

Practical tips for policymakers and analysts

Insert Web Page

This app allows you to insert secure web pages starting with `https://` into the slide deck. Non-secure web pages are not supported for security reasons.

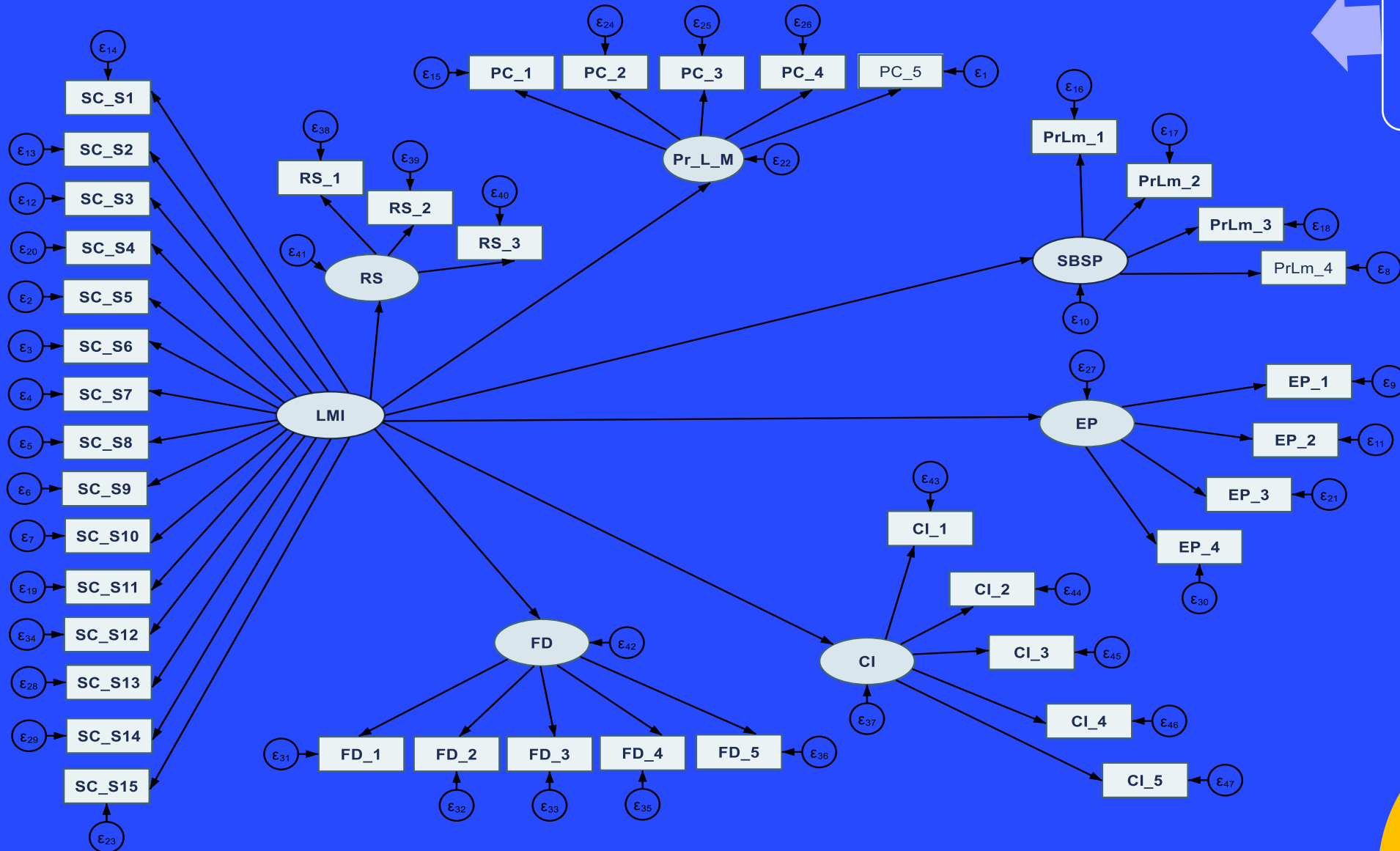
Please enter the URL below.

Note: Many popular websites allow secure access. Please click on the preview button to ensure the web page is accessible.

LMI data analysis – methods and software

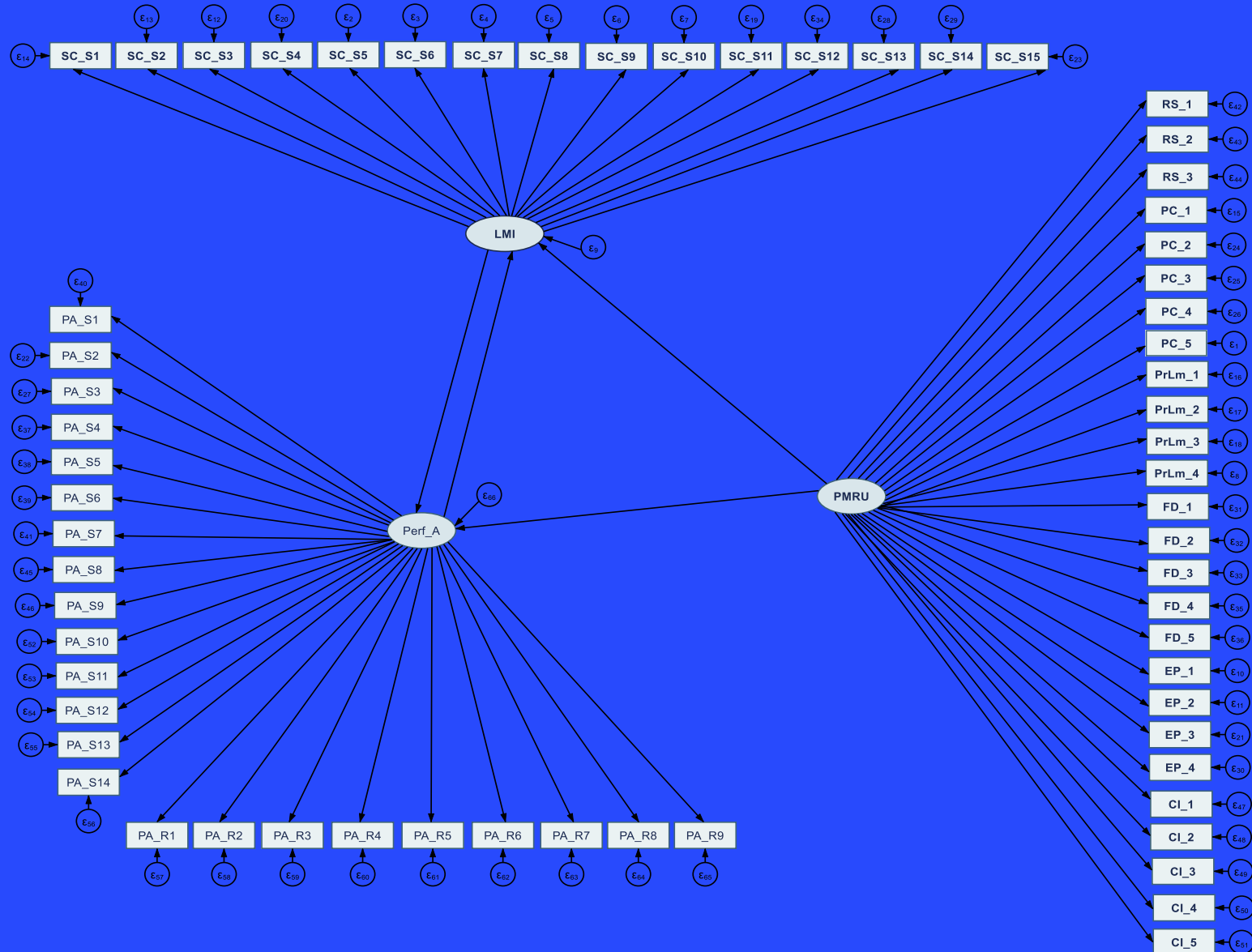
Structural equation modelling (SEM) processed in Stata

Example 1
SEM

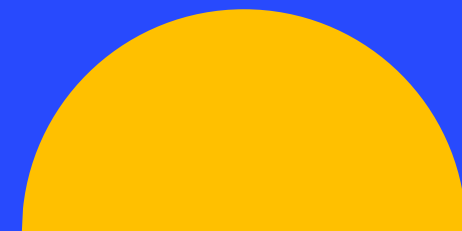


LMI data analysis – methods and software

Structural equation modelling (SEM) processed in Stata



Example 2
SEM



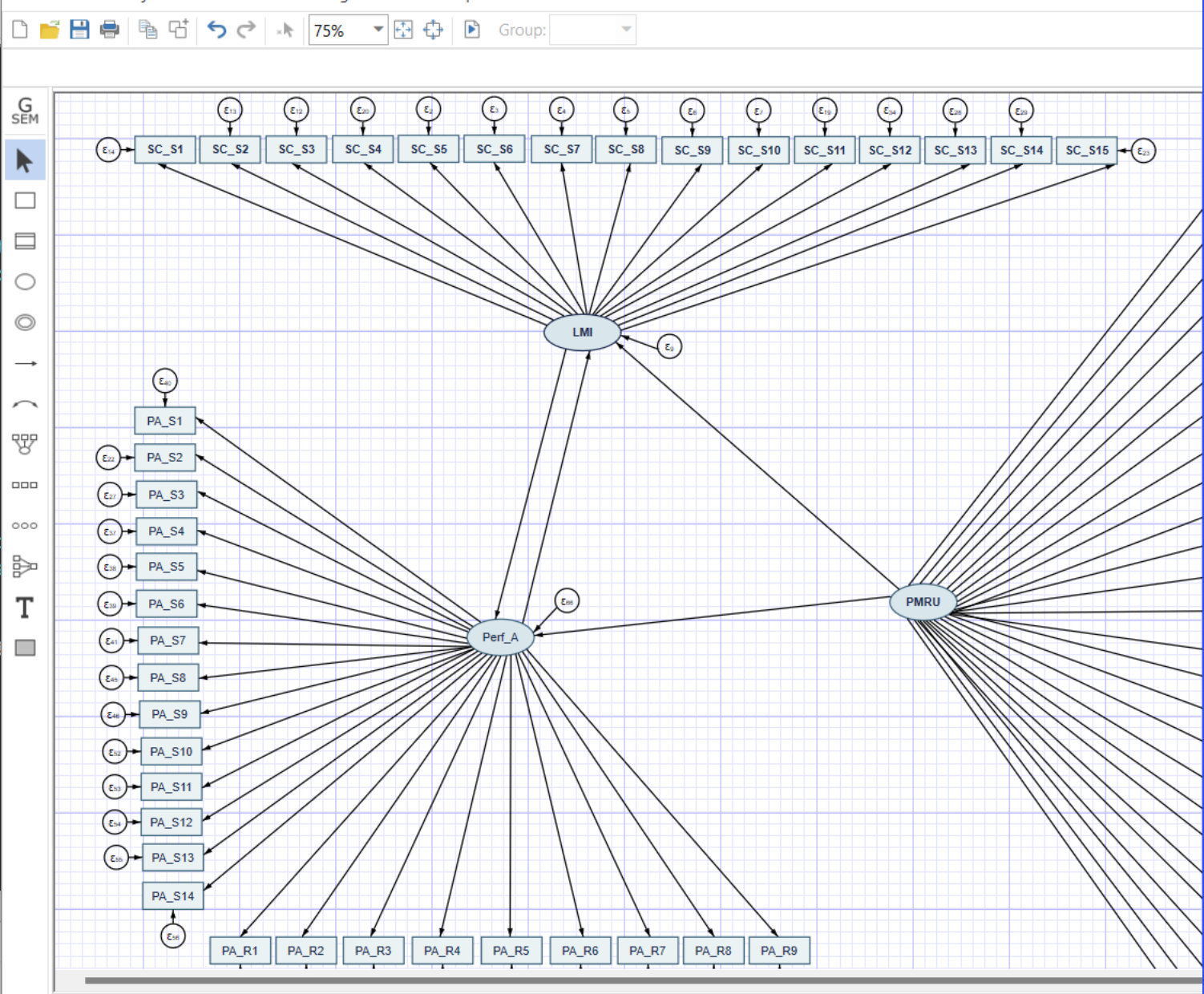
LMI data analysis – methods and software

```
STATA (R) 16.1 Copyright 1985-2019 StataCorp LLC
Statistics/Data analysis
MP - Parallel Edition
4905 Lakeway Drive
College Station, Texas 77845 USA
800-STAT-PC https://www.stata.com
979-696-4600 stata@stata.com
979-696-4601 (fax)

Stata license: Single-user 2-core perpetual
Serial number: 501606268048
Licensed to: Gratiela Noja
West University of Timisoara

Notes:
1. Unicode is supported; see help unicode_advice.
2. More than 2 billion observations are allowed; see help obs_adv.
3. Maximum number of variables is set to 5,000; see help set_maxvar.
4. New update available; type -update all-

Command: sembuilder "C:\Users\grati\OneDrive\Desktop\Acer documente laptop 2018"
```



Command

LMI data analysis – methods and software



- **Free:** JASP is an open-source software developed by the University of Amsterdam.
- **Friendly:** JASP has an intuitive and user-friendly interface.
- **Flexible:** JASP offers standard and advanced statistical analyses in various manifestations.

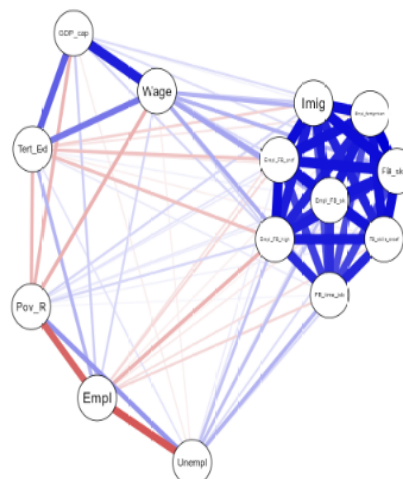
So open a data file

- Centrality table
- Clustering table
- Weights matrix

Click

Wage	0.881	0.204	0.538	-0.310	0.000	-0.061	0.162	0.309	0.382	0.333	0.306
Unempl	-0.072	0.101	0.106	0.419	-0.061	0.000	-0.663	0.112	0.251	0.303	0.132
Empl	0.191	-0.115	0.294	-0.602	0.162	-0.663	0.000	-0.065	-0.049	-0.166	-0.085
Empl_foreign-born	0.141	0.949	-0.105	0.080	0.309	0.112	-0.065	0.000	0.904	0.710	0.999
Empl_FB_sk	0.222	0.906	0.060	0.070	0.362	0.251	-0.049	0.904	0.000	0.824	0.911
FB_time_job	0.162	0.669	0.084	0.041	0.333	0.303	-0.166	0.710	0.824	0.000	0.736
FB_skills	0.133	0.948	-0.102	0.087	0.306	0.132	-0.085	0.999	0.911	0.736	0.000
FB_skills_prof	0.136	0.864	-0.065	0.059	0.305	0.153	-0.127	0.934	0.876	0.857	0.948
Empl_FB_prof	0.003	0.947	-0.238	0.106	0.149	0.075	-0.147	0.923	0.841	0.753	0.929
Empl_FB_high	0.013	0.889	-0.252	0.162	0.157	0.240	-0.302	0.867	0.830	0.837	0.880

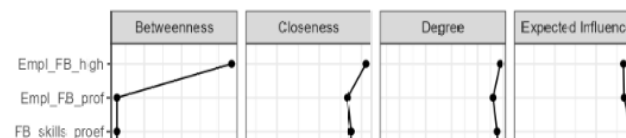
Network



Example 3
JASP

GGMs and
MGMs

Centrality Plot



Clustering Plot



LMI data analysis – methods and software

The image shows the RStudio interface with a data table, console output, and a package list.

Data Table:

	unemp_l_n	gdpcapr	gbardtexp	connect_n	intdigtech_n	digipubserv_n	humcap_n	advusersk_n	egovuser_n	rdpers_n	emphlmtech_n	log
1	4.800000	1.592580	1.45	3.4173946	0.2298193	31.16980	25.783394	9.3330975	73.013412	1.3829999	5.200000	
2	4.600000	2.576450	1.54	4.7613955	0.9865694	35.23880	26.111195	9.9997978	72.651711	1.4596000	5.500000	
3	4.900000	0.222451	1.50	6.1053963	1.7433195	39.30780	26.438995	10.6664980	72.290009	1.5362000	5.800000	
4	5.400000	-0.562299	1.55	7.4493971	2.5000696	43.37680	26.766796	11.3331990	71.928307	1.5468000	5.800000	
5	5.600000	-0.122371	1.52	8.7933979	3.2568197	47.44580	27.094597	11.9998990	71.566605	1.6323000	5.900000	
6	5.700000	-0.111540	1.56	10.1373990	4.0135698	51.51480	27.422398	12.6665990	71.204903	1.6458000	6.200000	
7	6.000000	0.892469	1.61	11.4814000	4.7703199	55.58380	27.750198	13.3333000	70.843201	1.6956000	6.000000	
8	5.500000	1.550720	1.59	12.8254000	5.5270700	59.65280	28.077999	14.0000000	70.481499	1.7072999	5.900000	
9	4.900000	1.927710	1.55	13.6277000	6.1499701	64.40660	28.405800	14.6667000	70.119797	1.7909000	6.300000	
10	4.500000	1.066970	1.56	16.2886010	6.7313399	69.04440	29.143000	15.0000000	75.291702	1.8591000	6.200000	
11	5.400000	-6.841540	1.52	16.9410000	7.2053099	74.25770	29.477900	14.3333000	78.807503	1.8414000	6.100000	
12	6.300000	4.102320	1.44	27.6654000	7.6935201	79.83360	29.812901	15.0000000	80.929604	1.9371001	6.500000	
13	8.300000	1.928760	1.21	-3.6241970	1.1810694	26.08298	21.626802	14.0000000	68.553925	1.2288001	5.400000	
14	7.200000	0.380035	1.15	-1.2333975	2.0754595	29.49448	21.901102	14.0000000	67.743221	1.3049001	5.200000	
15	7.600000	0.116403	1.14	1.1574020	2.9698496	32.90599	22.175402	14.0000000	66.932518	1.3810000	5.000000	
16	8.400000	-0.013148	1.14	3.5482016	3.8642397	36.31749	22.449701	14.0000000	66.121815	1.3837000	4.700000	
17	8.500000	1.128600	1.22	5.9390011	4.7586298	39.72899	22.724001	14.0000000	65.311111	1.4775000	4.800000	
18	8.500000	1.451890	1.13	8.3298006	5.6530199	43.14050	22.998301	14.0000000	64.500408	1.5727000	4.600000	
19	7.800000	0.755269	1.18	10.7206000	6.5474100	46.55200	23.272600	14.0000000	63.689705	1.5944000	4.500000	

Showing 1 to 20 of 324 entries, 14 total columns

Console:

```
R version 4.2.2 (2022-10-31 ucrt) -- "Innocent and Trusting"  
Copyright (C) 2022 The R Foundation for Statistical Computing  
Platform: x86_64-w64-mingw32/x64 (64-bit)  
  
R is free software and comes with ABSOLUTELY NO WARRANTY.  
You are welcome to redistribute it under certain conditions.  
Type 'license()' or 'licence()' for distribution details.  
  
R is a collaborative project with many contributors.  
Type 'contributors()' for more information and  
'citation()' on how to cite R or R packages in publications.  
  
Type 'demo()' for some demos, 'help()' for on-line help, or  
'help.start()' for an HTML browser interface to help.  
Type 'q()' to quit R.  
  
[workspace loaded from ~/.RData]
```

Package List:

Name	Description
abind	Combine Multidimensional Arrays
archivist	Tools for Storing, Restoring and Searching for R Objects
askpass	Safe Password Entry for R, Git, and SSH
backports	Reimplementations of Functions Introduced Since R-3.0.0
base64enc	Tools for base64 encoding
bit	Classes and Methods for Fast Memory-Efficient Boolean Selections
bit64	A S3 Class for Vectors of 64bit Integers
bitops	Bitwise Operations
blob	A Simple S3 Class for Representing Vectors of Binary Data ('BLOBS')
bootnet	Bootstrap Methods for Various Network Estimation Routines
brew	Templating Framework for Report Generation
brio	Basic R Input Output
broom	Convert Statistical Objects into Tidy Tibbles
bslib	Custom 'Bootstrap' 'Sass' Themes for 'shiny' and 'rmarkdown'
cachem	Cache R Objects with Automatic Pruning
calibrate	Calibration of Scatterplot and Biplot Axes
callr	Call R from R
candisc	Visualizing Generalized Canonical Discriminant and Canonical Correlation Analysis
car	Companion to Applied Regression
carData	Companion to Applied Regression Data Sets
cellranger	Translate Spreadsheet Cell Ranges to Rows and Columns
checkmate	Fast and Versatile Argument Checks
chords	Estimation in Respondent Driven Samples
circlize	Circular Visualization
cli	Helpers for Developing Command Line Interfaces

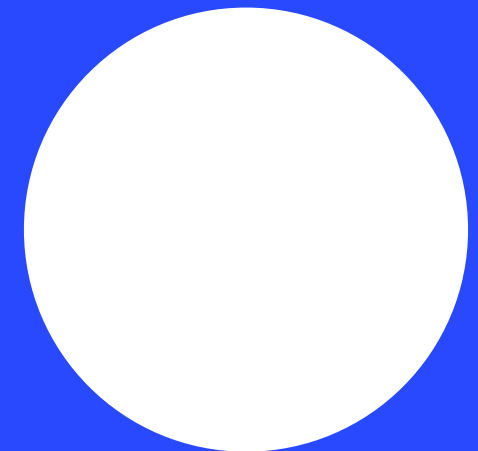
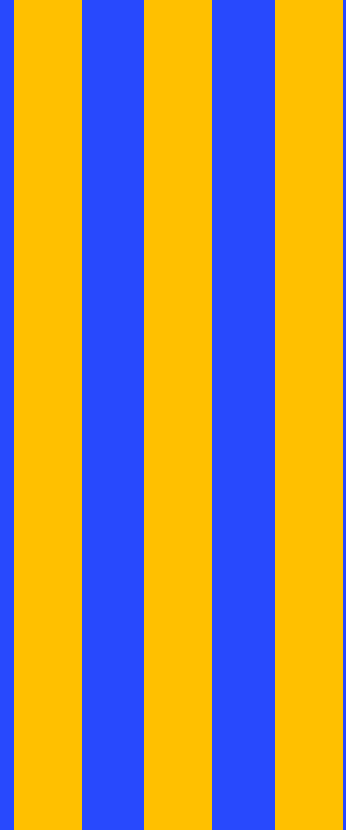
Example 4 RStudio

Resources

1. LMI HUB (2023). Innovating the use of Labour Market Intelligence within European Universities. URL: www.lmi-euniv.eu/lmi-euniv-hub
2. European Centre for the Development of Vocational Training (CEDEFOP) (2023). Skills-OVATE. URL: www.cedefop.europa.eu/en/tools/skills-online-vacancies.
3. Web Intelligence Hub | Eurostat CROS (europa.eu). URL: https://cros-legacy.ec.europa.eu/content/trusted-smart-statistics-%E2%80%93-web-intelligence-hub_en.

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3. Descy, P., Kvetan, V., Zukersteinova, A., Wirthmann, A., & Reis, F. (2019). Towards a Common Infrastructure for Online Job Vacancy Data. *Statistical Journal of the IAOS*, 35(4), 669-675.
4. European Centre for the Development of Vocational Training (CEDEFOP) (2023). Skills-OVATE. Retrieved from www.cedefop.europa.eu/en/tools/skills-online-vacancies.
5. Mezzanzanica, M., & Mercorio, F. (2019). Big data for labour market intelligence: An introductory guide. European Training Foundation.
6. Panzaru C., Brandas C. Filip F. (2016). Data Driven Decision Support Systems: An Application Case in Labour Market Analysis. *Romanian Journal of Information Science and Technology*, 19.1-2
7. Panzaru, C. Brandas, C. (2017). A Conceptual Model of Collaborative Support Sistem for Labour Market Governance. In the Importance of Governance in Regional Labour Market Monitoring for Evidence-based Policy-making, Christa Larsen, Sigrid Rand, Alfons Schmid, Tilman Nagel, Heike Hoess (Eds.). Rainer Hampp Verlag, Augsburg, München



What have we learnt?

QUIZ

- 1** What is the primary role of LMI in identifying skills needs and disparities?
 - A) To provide data for academic research.
 - B) *To aid policymakers in identifying high-demand occupations and emerging skill requirements.*
 - C) To directly offer jobs to individuals.
- 2** How does LMI contribute to career education and training initiatives?
 - A) *By ensuring these programs are aligned with employer skill demands.*
 - B) By providing financial support to students.
 - C) By creating new job roles in the market.
- 3** What is the importance of including real-time data in LMI?
 - A) To explore historical labor trends.
 - B) *To provide up-to-date insights about the labour market*
 - C) To reduce the need for data analysis.

Thank you

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