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# Innovative Approach to Measuring Skill Shortages: Insights from the Chilean Labour Market

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# 1. Labour market through online data

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Most research have access only on online job advertisements (demand side)

This study also used jobseeker CVs—capturing both sides of the market

The goal then was to explore solutions to patterns related to the skill shortage problem

# 2. Skill Shortage Tracking Challenges

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## What is a skill shortage?

A skill shortage arises when the demand for workers with specific skills exceeds the available supply at a particular wage level, location, and point in time (Eurofound, 2021)

Why is it hard to measure?

The concept is complex and multi-dimensional

# 2. Skill Shortage Measurement Challenges

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## Limitations of traditional methods:

Labour surveys rely on employer perceptions → risk of bias.

Surveys are not conducted frequently enough → risk of being too late with the information

## Why this matters:

There is a risk of overestimating skill shortages and misallocating valuable resources as a result

Without early information for detection, skill shortages intensify over time.

Once skill shortages are evident, corrective action is slow, costly, and less effective

# 2. Skill Shortage Measurement Challenges

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- Use of online data: is promising, but we need to put in significant effort to extract and process the information

HR Consultant, requires a Developer to join the team of an important retail company. Responsibilities: Participate in the design of IOS application architecture. Perform estimates for development cycles. Work with designers to define and implement user interfaces. Develop and maintain mobile applications and implement applications with high security standards. Requirements: Engineer in Computer Science, Computer Science, Systems or related career. 2 years of experience in Android and/or IOS Mobile Development projects. Git and XML handling. HTML and JavaScript experience. Knowledge in Microsoft .NET, #C, PHP, etc. and databases such as Microsoft SQL Server. Experience in Swift, Java or Kotlin. Experience in agile development for iOS, particularly using techniques such as Storyboards, Adaptive Layout and Extensions. Experience with web and mobile technologies. Experience with mobile application security. Solid experience with libraries (Swifty, JSON, Almofrej, Unbox, OHHTTP Stubs). Knowledge of Design Patterns (MVC, Adapter, etc). Knowledge in Development with XIB/Storyboards. Import and export of data from native to WebView component (Android), UIWebView/WKWebKit (iOS) and vice versa.

# 3. Proposed methodological approach

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| | |
|---|---|
| 1. Detecting and removing duplicates | • Removing multiple job ads for the same vacancy |
| 2. Coded data into 4-digit ISCO-08 occupations | • Through custom-built code tailored to the Chilean labour market |
| 3. Pre-processed data to extract key information | • Developed multiple information extractors using: text mining, machine learning, and LLMs.<br>• Generated structured variables from unstructured text. |
| 4. Built occupaciontal indicators for single features | • New variables enable analysis of location, wages (offered/expected), requirements consistency, type of skill in demand, previous work experiences, among others |
| 5. Combined indicators into a composite index of skill shortages | • Aggregated indicator: higher scores reflect stronger skill shortage signals in the occupation |

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# 4. Key findings from the index

## Chilean data 2017-2020

# 4. Key findings from the index

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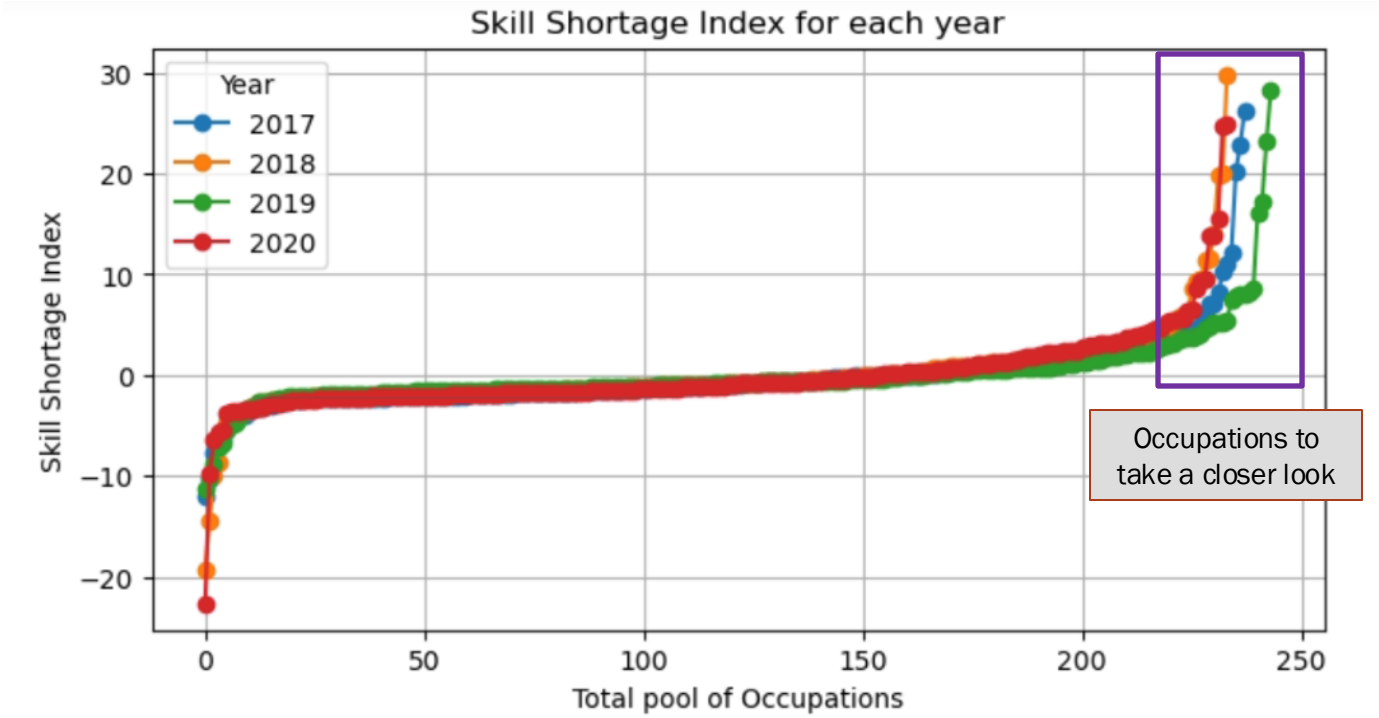
- Consistent results across four years (2017–2020).
- Only ~20 occupations per year show high skill shortage signals
- Intuitively, it makes sense that only a small margin of all occupations show signs of skill shortage.

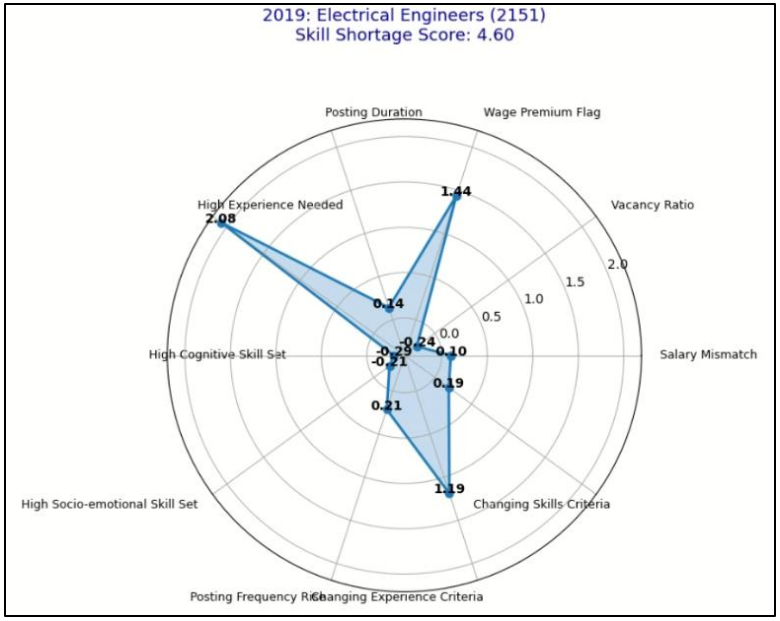


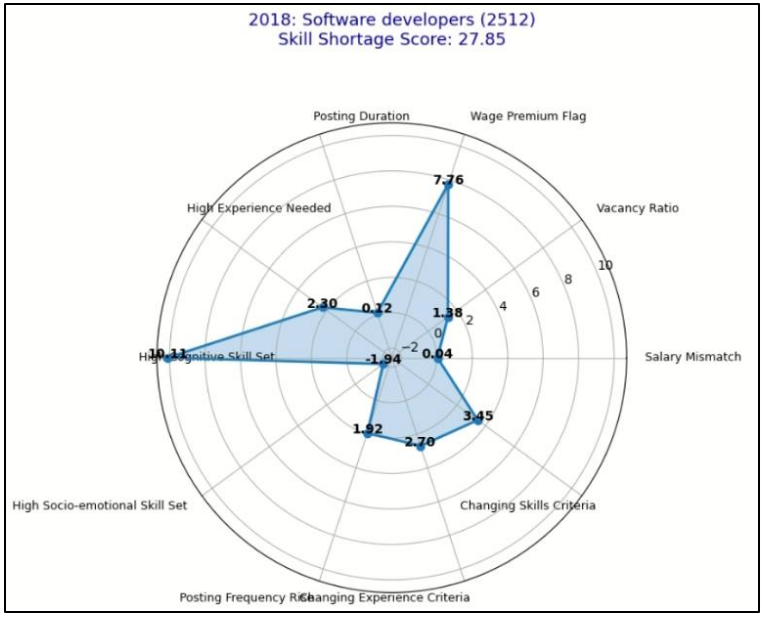
# 4. Key findings from the index

- Two types of skill shortages identified:
  - **Temporal skill shortages**: present in 1 or 2 years.
  - **Structural skill shortages**: persist across 3–4 years.

# 4. Key findings from the index

- The index allows granular analysis:
  - Disaggregate by indicator to understand which variables drive the score for each occupation.

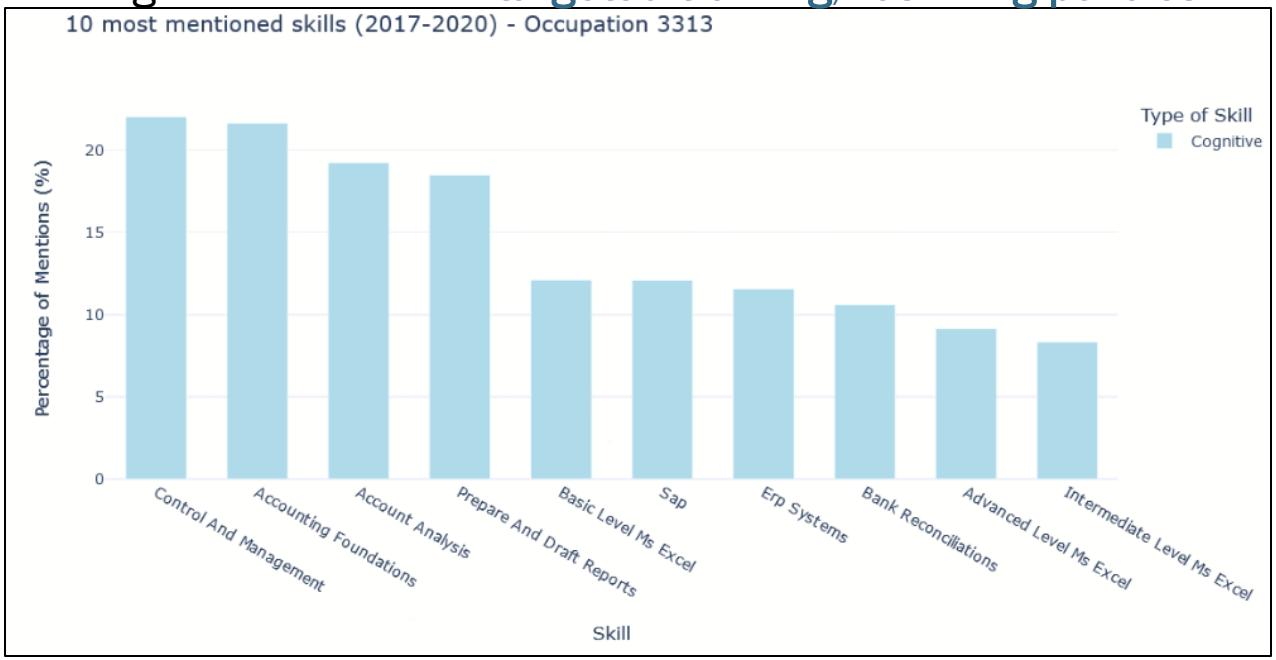



- This enables a more targeted response—identifying not only where skill shortages exist, but also what type of intervention might be needed.

# 5. Granular mapping of skills

- Automated extraction of in-demand skills from job advertisements.
- Identifies skills most required by employers
- Example – Accounting Technicians:
  - Control and management skills→ mentioned in 24% of job postings
  - Knowledge on Ms Excel (basic) → mentioned in 13% of job postings
- These insights could inform targeted training, reskilling policies.



# 6. Conclusions

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## Methodological Contributions:

Introduces a multidimensional approach to measuring skill shortages

Incorporates the online supply side (jobseekers), less studied at scale due to limited access

Enables early-warning systems to detect emerging skill shortages

Scalable and transferable to other labour markets

The methodology complements, rather than replaces, traditional survey-based approaches

Caution: online data is not representative like labour surveys

## Policy Relevance:

Supports evidence-based workforce planning and upskilling strategies

Enables policymakers to target interventions by occupation and skill

Offers a flexible framework to monitor both persistent and emerging skill shortage patterns

# For more information

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