Territorial Diagnosis of Labor Market Tensions in France

MScT DEPP Policy-In-Action Project

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Overview

Introduction

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French Labor Market Challenges:

- High unemployment rates coexist with recruitment difficulties.
- Regional disparities in employment dynamics and job vacancies exacerbate these tensions.

Objective:

- Develop an interactive mapping tool for diagnosing labor market tensions across different territories in France.
- Integrate job vacancies, administrative jobseeker data, and statistical analyses to identify regions experiencing high labor market tensions.

Relevance:

- No publicly available tool provides a granular territorial diagnosis of labor market tensions by sector level.
- Link these categories to potential public policy interventions aimed at reducing mismatches.

Data

Data

Job Offers: Job Offers Collection and Analysis System (JOCAS)

- Compiled daily by DARES to include job vacancies published online across France (excluding Mayotte) during 2020.
- Includes job offers data from 18 job posting websites.

Job Seekers: Statistique Mensuelle du Marché du Travail (STMT)

- Provides 2020 monthly statistics on jobseekers registered with France Travail.
- Available at the communal level for communes with more than 5000 inhabitants.
- In line with the methodological choices made by DARES (2023), we filtered for the following jobseeker categories[1]:
  - **Category A:** Unemployed, actively seeking, immediately available for employment.
  - **Category B:** Short-term reduced activity ($\leq$ 78 hours/month), actively seeking a job.
  - **Category C:** Long-term reduced activity ($>$ 78 hours/month), actively seeking a job.

[1] Defined in jobseekers application in France Travail, according to INSEE.

Data

Geographic Reference Datata:

- **Communes:**
  - Used the January 2022 shapefiles of French communes from the administrative boundaries provided by OpenStreetMap and data.gouv.
- **Employment Zones (Zones d'emploi):**
  - Used the 2020 zoning of employment areas provided by INSEE.
  - Each commune is associated with a corresponding zone d'emploi to perform aggregation and spatial mapping.

Methodology

Measurement Strategy (1)

Objective: Measure Labor Market Tightness (LMT) using a Market Tightness Indicator (MTI).

Definition: MTI is based on the vacancy-to-unemployment ratio (θ), standardized across zones, occupations, and months:

$$\text{MTI}_{ze,f,t}^{(i)} = \frac{\theta_{ze,f,t}^{(i)} - \mu_t^{(i)}}{\sigma_t^{(i)}}$$

where:

- $\theta_{ze,f,t}^{(i)} = \frac{V_{ze,f,t}}{U_{ze,f,t}^{(i)}}$: Vacancy-to-unemployment ratio (job offers/job seekers) for $i \in \{A, ABC\}$.
- $\mu_t^{(i)}$, $\sigma_t^{(i)}$: Monthly national mean and standard deviation of θ for the same category.

Purpose: Standardization removes seasonal effects, enabling consistent comparisons across space and occupations.

Measurement Strategy (2)

Interpretation of vacancy-to-unemployment ratio:

- $\theta^{(i)}_{ze,f,t} = \frac{V_{ze,f,t}}{U^{(i)}_{ze,f,t}} > 1$: Tight market with more job offers than job seekers. Employers face hiring difficulties, leading to upward wage pressure.
- $\theta^{(i)}_{ze,f,t} = \frac{V_{ze,f,t}}{U^{(i)}_{ze,f,t}} \leq 1$: Slack market with equal or more job seekers than offers. Increased competition among workers reduces wage pressure.

Measurement Strategy (3)

Yearly MTI Calculation:

$$\text{MTI}^{(i)}_{ze,f} = \frac{1}{12} \sum_{t=1}^{12} \text{MTI}^{(i)}_{ze,f,t}$$

This transformation captures average monthly standardized tightness over the year for each zone and occupation.

Implementation:

- We compute two versions of the MTI: one using only Category A and another using the broader ABC category.

Scoring System

- We construct a scoring system with scores ranging from 1 (slackest) to 5 (tightest), using quantile-based bins applied to monthly mean z-scores.
- This approach is inspired by the Labour Market Tension Indicators developed by DARES (2022).

Score	**Tightness Level**
1	Labor Surplus
2	Available Labor
3	Fragile Balance
4	Relative Labor Shortage
5	Severe Labor Shortage

Table: Labour Market Tightness Score Scale

Technical Implementation

Data Processing: JOCAS

Data Cleaning:

- Loop through source folders and monthly subfolders.
- Read and clean raw job offers data:
  - Standardizing commune names.
  - Filtering for communes with more than 5,000 inhabitants.
  - Removing missing ROME job codes.
- Map each ROME code to its FAP22[2] and FAP87[3] categories using the official DARES (2024) correspondence table.
- The final dataset was aggregated by commune, FAP categories, and month, with job offers summed for each grouping

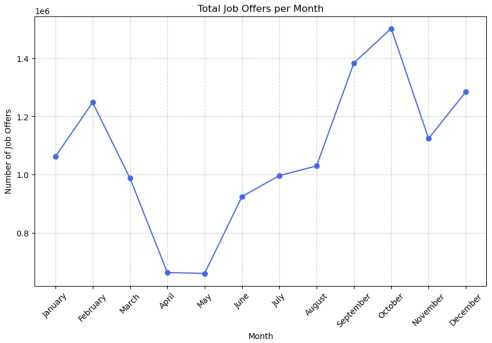
Robustness Checks:

- Job Offers Frequency: 963,800
- Coverage of communes: 2230 out of 2230.
- Distribution of FAP87 job categories: 86 out of 86.
- Temporal consistency: 12 months.

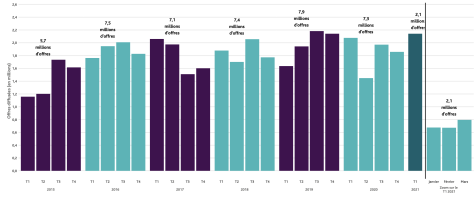
[2] 22 broad professional families/categories

[3] 87 aggregated (finer) professional families/categories

Data Processing: JOCAS



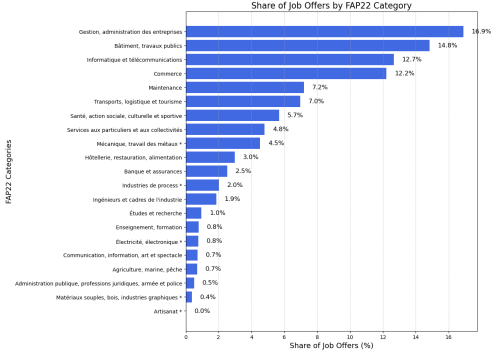
(a) **Source: JOCAS Dataset**



(b) **Source: Pôle Emploi (France Travail)**

Key Insight: The JOCAS dataset focuses on communes with over 5,000 inhabitants, limiting its scope compared to Pôle Emploi, which covers all of France. Methodological differences, such as transitioning from ROME to FAP codes and biases favoring higher-skilled online job postings, may underrepresent low-skilled roles. Despite these differences, both datasets show slightly similar seasonal trends, including a drop in job offers during T2 due to COVID-19 restrictions.

Data Processing: JOCAS



(a) **Source: JOCAS Dataset**

(b) **Source: DARES**

Key Insight: The 2020 JOCAS data focuses on French communes with over 5,000 inhabitants, while the 2019 data covers all French territories. Despite differences in scope and year, both datasets show similar patterns.

Data Processing: STMT

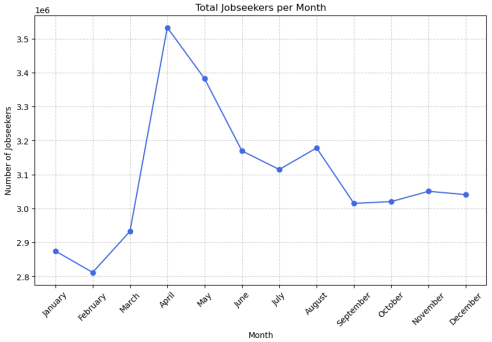
Data Cleaning:

- Process monthly STMT CSV files, standardize commune names, restructure jobseeker data, and merges it with job classification codes to facilitate comparison with job supply data.
- Result: Dataset aggregates jobseekers by commune, FAP categories, and month.

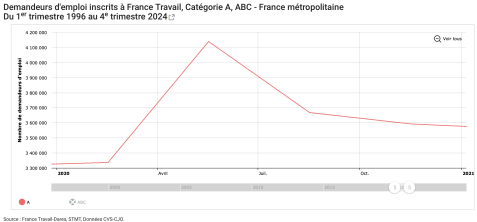
Robustness Checks:

- Jobseekers Frequency: 808,627
- Coverage of communes: 2230 out of 2230.
- Distribution of FAP87 job categories: 86 out of 86.
- Temporal consistency: 12 months.

Data Processing: STMT



(a) **Source: STMT Dataset**



(b) **Source: France Travail**

Key Insight: Our 2020 STMT data shows patterns similar to the France Travail report on national job vacancies for the same year. Discrepancies arise due to the exclusion of small communes (which account for approx. 1 out of 3.7 million jobseekers), differences between raw and adjusted data (France Travail adjusted for seasonal variations and working-day effects), potential duplication from mapping ROME to FAP codes, and rounding errors in STMT public data (number of josbeekers rounded to the closest decile).

Ratio and Score Computation

Handling zeros and missing values:

- To prevent division errors, zero jobseeker counts are replaced with one.
- Missing values in job offers or jobseeker data are filled with zero.

Demo

Limitations and Considerations

Limitations and Considerations

Geographic and data coverage gaps:

- Some communes or employment zones are excluded due to missing data or unmatched geographic references.
- Four employment zones are entirely missing: Château-Gontier, Ghisonaccia, Mayotte, and Propriano.
- This introduces a coverage bias, particularly in rural or less populated areas.

Aggregation Uncertainty:

- Assigning communes to employment zones introduces imprecision, especially for communes spanning multiple zones.

Interpretation over time:

- Tightness scores are standardized within each year and cannot be directly compared across different years.
- Future updates with multi-year data should apply yearly standardization for consistent temporal comparisons.

Descriptive tool only:

- The tool is exploratory and descriptive in nature. It does not support causal inference and should be used accordingly.

Conclusion

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Key features of the tool:

- Provides a systematic, spatially-explicit approach to measure and visualize labor market tightness across France.
- Facilitates improved monitoring of regional and sectoral labor market imbalances, supporting employment policy planning.
- Lays a strong foundation for further research and public data dissemination.

Further Improvements:

- Add filters for qualification level, age, gender, and contract type to enable more targeted analysis of labor dynamics.
- Incorporate additional metrics like recruitment delays, contract quality, or skill mismatches for multidimensional diagnostics of labor market tensions.

References

References

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