Uneven recovery: sectoral labour market mismatch in Austria after Covid-19

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Abstract

This paper investigates sectoral labour market matching in Austria using monthly administrative data from 2008 to 2024. We estimate sector-specific Beveridge curves and mismatch unemployment to assess the effects of the COVID-19 pandemic. While mismatch unemployment returned to pre-pandemic levels in most sectors, it remained elevated in hospitality and the public sector, particularly in healthcare. These results underscore the importance of working conditions for labour shortages, and the need for targeted policy interventions to address sector-specific frictions and enhance the efficiency of labour reallocation.

1. Introduction

The COVID-19 pandemic had profound effects on labour markets globally, disrupting both labour demand and supply. Austria, like many advanced economies, experienced a sharp yet temporary increase in unemployment in 2020, followed by a strong recovery (see Figure 1 below). However, recovery trajectories varied markedly across economic sectors. While aggregate labour market indicators returned to pre-pandemic levels relatively swiftly, deeper

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structural challenges persist in certain segments. This paper examines these enduring mismatches in Austria's labour market through a sectoral lens.

The nature of these mismatches raises important questions for policymakers. To what extent do observed unemployment rates reflect temporary dislocations as opposed to long-term structural frictions? How have different sectors adapted in terms of hiring capacity, job quality, and occupational attractiveness? To what degree can existing institutions still facilitate effective labour reallocation?

A growing body of literature emphasizes the importance of disaggregating Beveridge curves to capture sector-specific labour market dynamics, particularly in the aftermath of large economic shocks. For example, Pizzinelli and Shibata (2023) and Shen et al. (2024) demonstrate that aggregate Beveridge curve shifts in the US and UK conceal divergent sectoral trends, with services and healthcare exhibiting persistent frictions. Similarly, Coskun et al. (2024) highlight how structural shifts in occupational preferences and working conditions, exacerbated by the pandemic, have altered the matching processes in certain sectors.

Sectoral Beveridge curves offer a more granular view of matching efficiency by accounting for heterogeneity in job search behaviour, vacancy posting, and worker mobility. This disaggregated approach is particularly relevant in countries such as Austria, where sector specific institutional frameworks shape labour market outcomes. Austria's labour market institutions are well documented and help explain its strong sectoral segmentation. Collective bargaining coverage is among the highest in Europe, around 98 % according to the OECD/AIAS ICTWSS database, reflecting the dominance of sector-level agreements that shape wages, working-time arrangements, and hiring norms. The country's apprenticeship-based vocational education and training system further reinforces occupational specificity and limits cross-sector mobility, with governance structures and training content closely aligned with sectoral employer associations (see Lassnigg, 2023; OECD, 2025). These institutional characteristics create relatively rigid sectoral boundaries and contribute to heterogeneous matching processes, highlighting the relevance of a sector-disaggregated Beveridge curve analysis for Austria.

Against this institutional backdrop, our study advances the literature by applying sector-specific Beveridge curve estimations to Austrian data, capturing both cyclical and structural components of post-pandemic mismatch.

Austria provides a particularly informative setting for analysing sectoral labour market mismatch for three reasons. First, the country combines high-quality administrative labour market data with a stable institutional environment, allowing the precise identification of matching frictions over time and across sectors. Second, Austria's labour market is characterised by a distinct sectoral composition, with a tourism-intensive hospitality industry and a large, centrally regulated public sector, two areas that were disproportionately affected by the pandemic and are known to exhibit persistent hiring bottlenecks. Third, Austria features limited cross-sector worker mobility, shaped by strong occupational segmentation, apprenticeship-based training, and sector-specific collective bargaining agreements. These features make Austria an ideal case for studying how structural characteristics magnify or mitigate the effects of large shocks on sectoral matching efficiency. At the same time, Austria's labour market institutions are broadly representative of many coordinated market economies in

continental Europe, enhancing the relevance of the Austrian experience for comparative and policy-relevant research. By estimating Beveridge curves and mismatch unemployment by sector, we identify heterogeneous recovery patterns and persistent mismatches that extend beyond the aggregate recovery. The findings can inform targeted policy efforts to reduce mismatch unemployment and improve labour market functioning in Austria and elsewhere.

2. Methods

We apply a standard matching model with a Cobb-Douglas matching function:

$$M_t = A_t \, U_t^{\alpha} V_t^{1-\alpha} \tag{1}$$

where U_t is the number of unemployed, V_t the number of vacancies, A_t denotes matching efficiency, and α is the elasticity of matches with respect to unemployment. We follow Veracierto (2011), Christl (2020) and Christl et al. (2025) to estimate time-varying matching efficiency.

Mathematically, mismatch unemployment U_t^m is expressed as:

$$U_t^m = U_t - U_t^{stab} = \frac{\lambda_t}{\lambda_t + A_t \left(\dfrac{V_t}{U_t}\right)^{1-\alpha}} - \frac{\lambda_t}{\lambda_t + A_t^{stab} \left(\dfrac{V_t}{U_t}\right)^{1-\alpha}} \tag{2}$$

where U_t is observed unemployment, U_t^{stab} is the counterfactual unemployment with stable matching efficiency A^{stab}, λ_t is the separation rate, and V_t is the number of vacancies.

The first term on the right-hand side represents unemployment under actual matching dynamics, while the second reflects constant (pre-pandemic) matching efficiency.

Our empirical framework allows sector-specific estimation of Beveridge curves and time-varying matching efficiency. Mismatch unemployment is defined as the difference between the observed unemployment rate and a counterfactual unemployment rate under stable pre-pandemic matching efficiency. Formally, it captures the portion of unemployment attributable to time-varying frictions in the matching process, rather than to aggregated or cyclical shocks.

We assume sectoral immobility, consistent with high within-sector job-finding rates (see Table 2). While regional variation also matters, we focus on sectoral differences to isolate persistent structural frictions.

3. Data

We employ monthly administrative data from the Austrian Public Employment Service (AMS), covering the period from January 2008 to the first quarter of 2024. This dataset contains sector-level information on unemployment, employment, and vacancies disaggregated at the NACE 2-digit level. To ensure sufficient sample sizes and economic interpretability, we aggregate sectors into six broad categories: industry, construction, wholesale and retail, hospitality, the public sector (including health and education), and a residual "other" category.

To contextualize the sectoral analysis, Figures 1 and 2 present the evolution of Austria's aggregate labour market indicators over the full sample period. The unemployment rate (Figure 1) exhibits strong seasonal patterns and a pronounced spike in 2020, coinciding with the COVID-19 shock, followed by a rapid decline towardhistorically low levels by 2022.

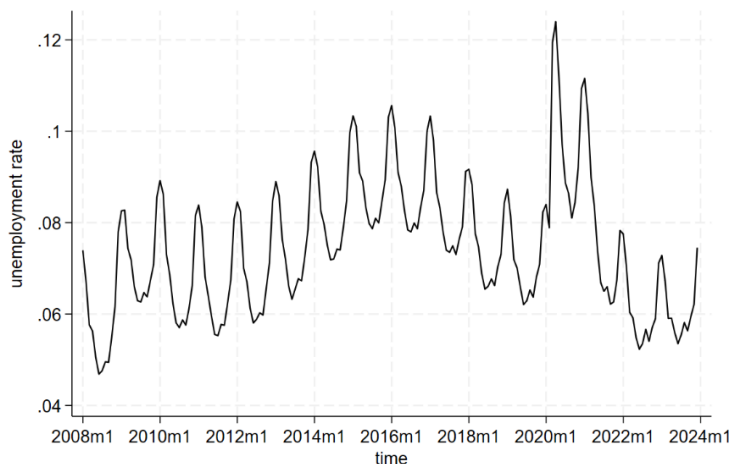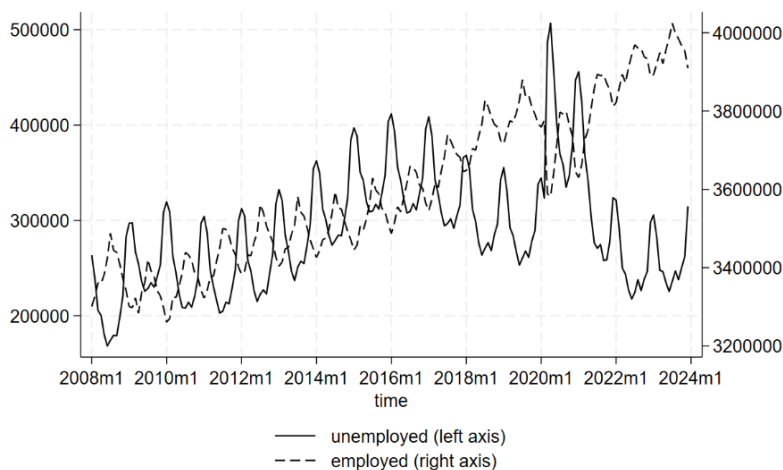**Figure 1.** Historical unemployment rate in Austria (2008-2024)

Figure 2 shows the corresponding series for employment and unemployment levels. Employment increased steadily from 2008 until the pandemic, with only a temporary interruption in 2020, while unemployment displays marked seasonality and a temporary surge during the containment period.

Figure 2. Employment and unemployment development in Austria (2008-2024)

Together, these figures illustrate the underlying macroeconomic environment, characterised by long-run employment growth, strong seasonal variation, and the abrupt COVID-19

disruption, against which our sector-specific Beveridge curve estimations are to be interpreted.

Table 1 summarizes key sectoral labour market indicators, including employment, unemployment, and labour force shares as monthly averages over the entire sample period (2008–2024). This long-run average is intended to provide a stable overview of Austria's sectoral labour market composition, smoothing short-term fluctuations. The public sector and the 'others' category together account for more than half of the total labour force. Unemployment is disproportionately concentrated in hospitality and construction, indicating potential sector-specific frictions.

Table 1. Labour market characteristics by sector (monthly average 2008-2024)

Sector	Labour Force		Employed		Unemployed	
	Count	Share	Count	Share	Count	Share
Industry	574,332	14.8%	548,430	15.3%	25,902	8.6%
Construction	287,064	7.4%	256,266	7.2%	30,797	10.2%
Wholesale/Retail	579,040	14.9%	535,119	14.9%	43,921	14.6%
Hospitality	235,690	6.1%	196,566	5.5%	39,124	13.0%
Public Sector	948,781	24.4%	910,395	25.4%	38,386	12.8%
Others	1,258,238	32.4%	1,135,821	31.7%	122,416	40.7%
Total	3,883,144	100.0%	3,582,598	100.0%	300,546	100.0%

Note: Labour force, employment, and unemployment counts are annual averages over the sample period.

Table 2 reports within-sector job finding rates over the period 2007–2023:

Table 2. Within-sector job finding rates, 2007–2023

Sector	Job Finding Rate (%)
Construction	91.0
Hospitality	87.7
Industry	75.1
Wholesale and Retail	74.9
Public Sector	77.2
Others	87.1

Note: Share of unemployed workers who transition to employment within the same sector.

The high rate of re-employment within the same sector suggests limited inter-sectoral mobility. For instance, over 90% of workers in construction and nearly 88% in hospitality find new employment within the same sector following a spell of unemployment. While the job finding rate across different sectors vary substantially across time, as highlighted in Figure 8 in
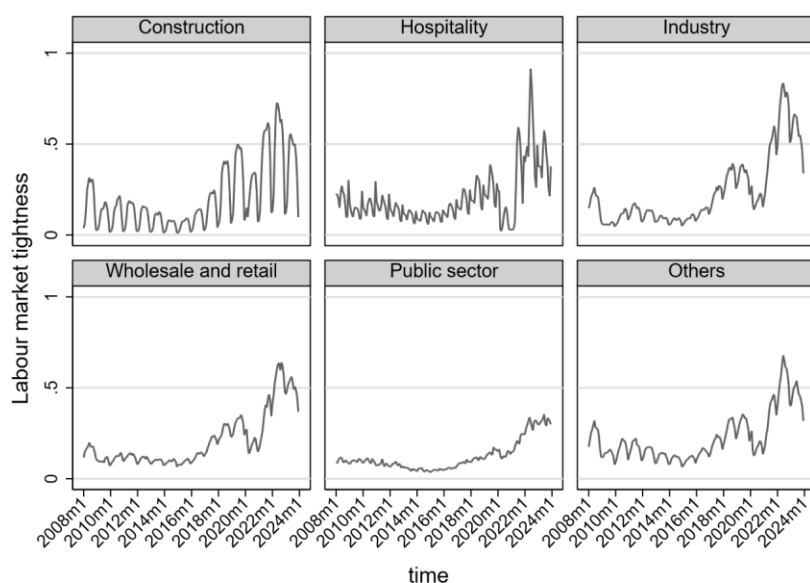
the Appendix, the within-sector job finding rates do not very markedly over time (Christl et al., 2024). These patterns provide a rationale for the use of sector-specific Beveridge curves in our analysis.

4. Results

4.1. Labour market tightness

Labour market tightness, defined as the vacancy-to-unemployment ratio, offers a primary indication of evolving sectoral dynamics. Figure 3 illustrates a steady increase in labour market tightness across all sectors beginning in 2015, culminating in a sharp peak in 2022. This trend reflects strong vacancy growth alongside relatively stable unemployment levels. Hospitality and construction exhibit pronounced seasonal fluctuations, whereas tightness in the public sector demonstrates a more persistent upward trend, consistent with structural pressures.

Figure 3. Labour market tightness by sector, 2008–2024

Note: Tightness is defined as the vacancy-to-unemployment ratio.

During the COVID-19 containment period, labour market tightness collapsed most dramatically in the hospitality sector. This outcome is unsurprising given that pandemic restrictions shut down most hospitality-related activities, effectively eliminating demand for new hires. With activity ceasing, firms stopped posting vacancies, resulting in an abrupt decline in tightness.
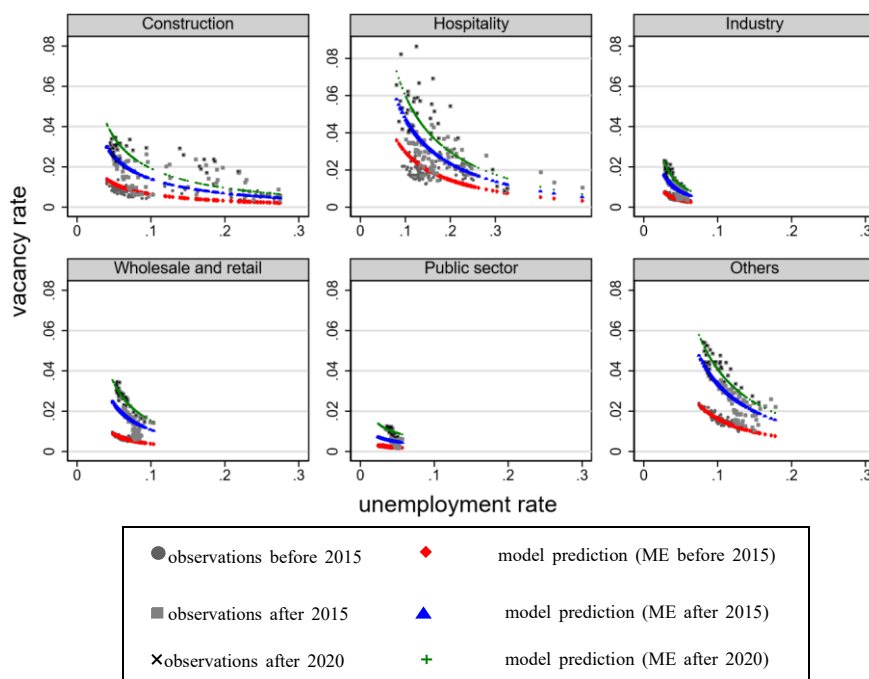
Following the reopening of the economy, the hospitality sector also exhibited the sharpest rebound in labour market tightness across all sectors. At its peak, tightness in hospitality approached the value of one, indicating that the number of vacancies nearly matched the number of unemployed workers with prior experience in the sector. This reflects acute labour shortages and an intense hiring scramble within the sector during the recovery phase.

These patterns are broadly consistent with findings from advanced economies, where the post-COVID recovery was characterised by labour market overheating and strong vacancy pressure, as documented by Duval et al. (2022).

4.2. Sectorial beveridge curves

To assess the extent of sector-specific frictions, we examine shifts in Beveridge curves. Figure 4 highlights two distinct shifts in the Beveridge curves. The first occurs around 2015, and the second coincides with the COVID-19 shock in 2020.

Figure 4. Beveridge curves by sector

The first shift, observable in most sectors, reflects a gradual outward movement of the Beveridge curve beginning after 2015, suggesting a structural decline in matching efficiency already underway prior to the pandemic. This pre-pandemic shift is relatively synchronized across sectors, although it is more pronounced in hospitality and the public sector.

The second outward shift occurs after 2020, in direct response to the pandemic. This pattern appears again across most sectors but is especially pronounced in hospitality and the public sector, suggesting a marked deterioration in matching efficiency in the wake of the COVID-19 shock. This contrasts with aggregate euro area findings, where only modest and temporary outward shifts in Beveridge curves were observed post-COVID. Kiss et al. (2025) show that most of the euro area-wide mismatch dissipated by late 2021, suggesting that the persistent mismatch, observed here in Austria's hospitality and public sectors, is a sector-specific, rather than macro-level, phenomenon.

4.3. Matching efficiency and mismatch unemployment

Mismatch unemployment refers to the gap between observed unemployment and the level that would prevail under stable matching efficiency over time. It reflects frictions that prevent job seekers and vacancies from being effectively matched - often resulting from changes in sectoral demand, evolving worker preferences, or institutional rigidities. By isolating this effect from cyclical fluctuations, mismatch unemployment provides a structural perspective on underlying labour market inefficiencies[1].

Figure 5 shows mismatch unemployment peaking in 2020 across all sectors, followed by a return to pre-crisis levels in industry and wholesale/retail. In contrast, mismatch unemployment remains elevated in hospitality and the public sector, particularly within healthcare.

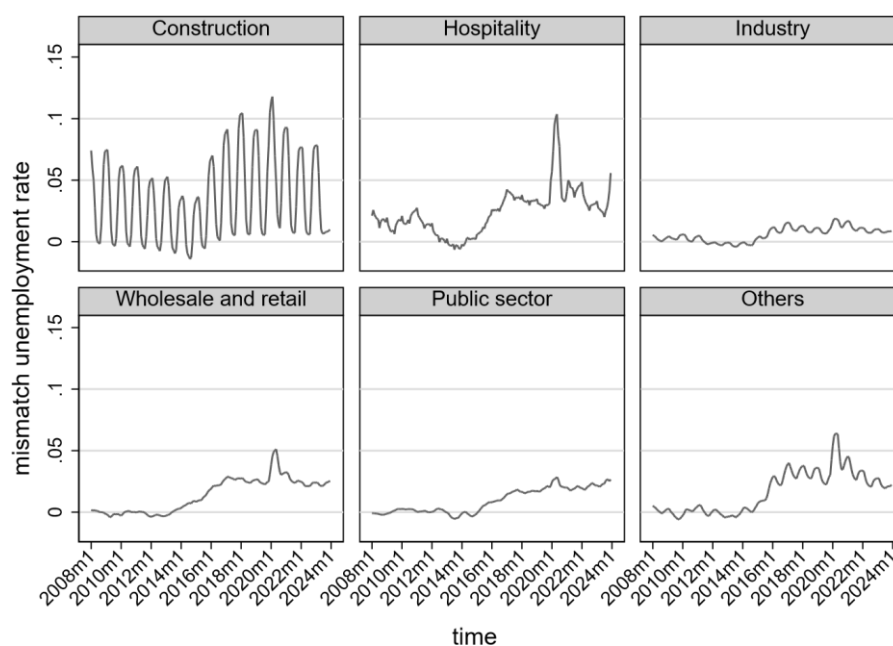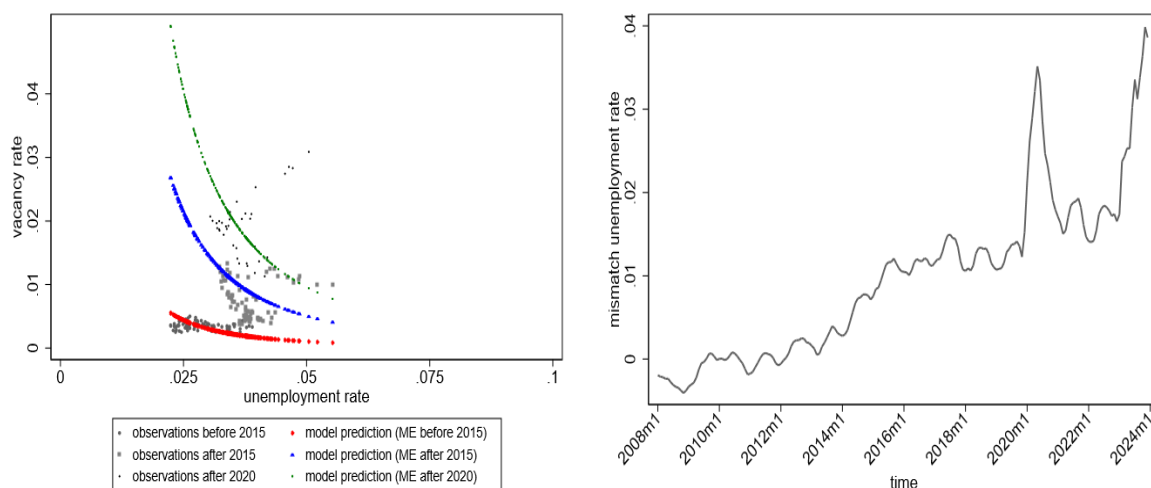**Figure 5.** Mismatch unemployment rate by sector, 2008–2024

Figure 6 highlights the healthcare sector, where mismatch unemployment has continued to rise, reaching its highest level in 2024. Other sectors, by contrast, exhibit post-pandemic normalization, suggesting that frictions in these sectors were primarily cyclical. The elevated and rising mismatch unemployment in healthcare and hospitality points to deeper structural problems, potentially related to job quality, working conditions, or shifts in occupational preferences in the aftermath of the pandemic. These persistent mismatches suggest that conventional macroeconomic recovery measures may be insufficient to restore labour market equilibrium in these sectors.

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[1] Figure 5 illustrates sectoral trends in matching efficiency, which is the underlying concept when calculating mismatch unemployment. A pronounced decline is visible in the public sector and hospitality beginning in 2014, which was further exacerbated during the pandemic.

Mismatch unemployment in the public sector, driven primarily by the healthcare segment, now constitutes a substantial share of total unemployment within that sector. This may reflect slow adaptation in public hiring practices or a reduced inflow into care professions.

In the hospitality sector, elevated mismatch appears linked to increased voluntary exits during the pandemic and reluctance to return to jobs perceived as insecure or involving unsocial working hours. These sector-specific frictions are consistent with recent evidence that both hospitality (Domonkos et al., 2024) and healthcare (Woodward et al., 2025) have faced acute post-pandemic hiring difficulties, driven by poor job quality and rising quit rates.

Figure 6. Beveridge curve and mismatch unemployment in healthcare

These trends likely reflect worsening job conditions, skill mismatches, and the declining attractiveness of certain occupations, particularly in care and tourism. Structural forces, rather than cyclical fluctuations, appear to be driving the persistence of mismatch unemployment in these sectors.

5. Conclusions

Our findings indicate that Austria's labour market has broadly recovered from the COVID-19 shock in aggregate terms, but this recovery has not been uniform across sectors. Persistent mismatch unemployment in hospitality and healthcare signals structural inefficiencies that may hinder productivity, service delivery, and economic resilience.

Policymakers should consider targeted interventions in these sectors. In the short term, measures to improve job quality–including competitive pay, improved working conditions, and enhanced occupational safety standards–could help attract and retain workers in sectors experiencing labour shortages. In the medium term, upskilling and retraining programs aligned with evolving occupational demands, particularly in health and care services, could enhance matching efficiency. In addition, improving working-time flexibility and addressing barriers to full-time employment may be crucial to unlocking underutilized labour reserves, especially among women and older workers. Public employment services have a central role to play in

mitigating mismatch by providing timely labour market information, identifying local bottlenecks, and deploying digital tools to improve job matching. Sector-specific placement strategies and active engagement with employers may help reduce search frictions and accelerate labour reallocation.

From a research perspective, our findings demonstrate the value of disaggregated analysis for uncovering hidden labour market pressures. Mismatch unemployment is often masked in national indicators but can reveal persistent and policy-relevant frictions when examined at the sectoral level. As demographic ageing, digitalization, and the green transition continue to reshape occupational structures, such frictions may deepen unless addressed proactively. Future work could broaden the analysis to other European countries for comparative insights. Understanding the micro-foundations and institutional determinants of mismatch is essential for designing evidence-based labour market policies in a post-pandemic economy.

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Appendix

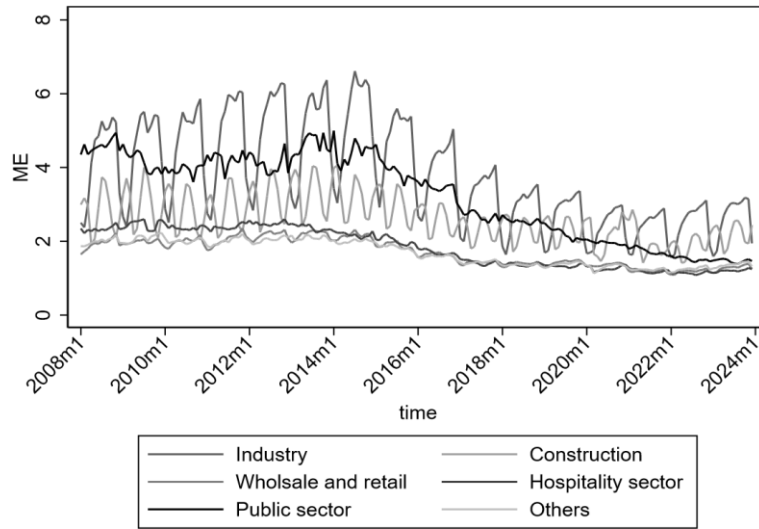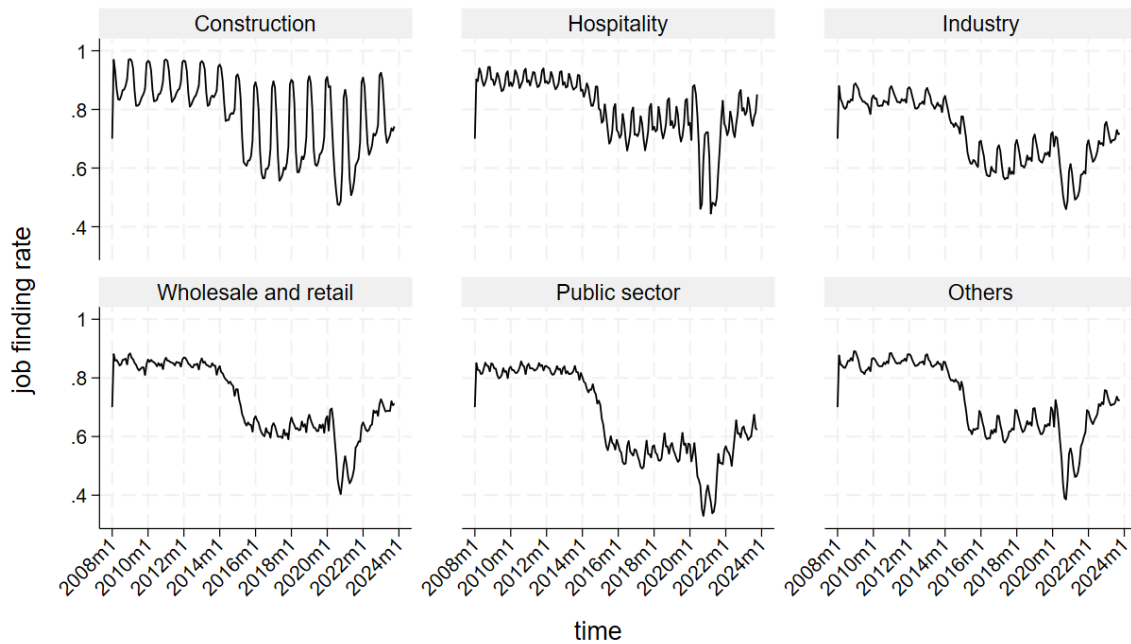**Figure 7.** Matching Efficiency by Sector, 2008–2024

Figure 8. Job finding rates by Sector, 2008–2024