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STRUCTURAL REFORMS FOR GROWTH: DYNAMIC EFFECTS ON LABOR MARKET OUTCOMES USING A LOCAL PROJECTION APPROACH

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Abstract:

This thesis analyzes the effects of structural labor market reforms on employment outcomes, focusing on how employment protection legislation, active labor market policies, and the labor tax wedge dynamically influence employment rates. Using local projections and a newly constructed panel dataset of 38 OECD economies from 1999 to 2018, this approach captures short- and medium-term responses to policy changes. The results show that stricter employment protection legislation gradually reduces employment in the medium term, while active labor market policy reforms only yield temporary gains. The findings provide evidence on the timing and magnitude of reform impacts, offering insights for policymakers aiming to promote growth through structural reforms.

Keywords: Employment Outcomes, Economic Growth, Labor Market Policies, Local Projections, OECD Countries, Structural Reforms.

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1. Introduction

Economic growth remained low in 2023, mainly because of a significant slowdown in the growth levels of labor productivity. This trend is particularly noticeable in the Eurozone, where GDP growth is expected to stagnate at around 0.7% in 2024, rising only modestly up to 1.5% by 2025 (OECD 2024b). While tight labor markets and historically low unemployment rates among OECD countries imply recovery, deeper structural challenges persist: Young and low-skilled workers experience limited job opportunities and a high risk of unemployment, while skill mismatches hinder the effective use of resources (OECD 2017).

To address these challenges, implementing structural reforms can be helpful to improve educational outcomes and skills while reducing barriers that currently limit investments and labor force participation (LFP) (OECD 2023; 2017). Specifically, these reforms can boost economic growth by enabling an efficient allocation of resources and fostering an adaptable labor force. However, as the pace of reform implementation has slowed alongside the economic growth levels, international organizations and central banks, such as the ECB and OECD, frequently advise policymakers to address challenges while simultaneously stimulating growth through targeted policy responses (Budina et al. 2023; European Central Bank 2014).

Typically, structural reforms involve reducing administrative burdens, introducing more flexible work arrangements, loosening hiring and firing regulations, and enhancing job opportunities for underrepresented groups (Duval et al. 2018; Wiese, Haan, and Jalles 2023). Thus, in areas with labor shortages, targeted training programs, immigration, and policies to raise LFP can help boost output while easing labor market pressures (OECD 2024b).

While the traditional literature often relies on growth regressions or vector autoregressions (VAR) to assess reform impacts, recent research has started to use Jordà's (2005) local projection (LP) approach to explore short- and medium-run effects. Unlike the conventional

econometric approaches, LPs flexibly capture dynamic responses without imposing rigid assumptions, which makes them a viable alternative to classic VARs (Duval and Furceri 2018).

Even though structural reforms aim to create efficient and dynamic economies, LP studies show that their benefits usually unfold gradually (Campos, De Grauwe, and Ji 2023; Parlevliet, Savsek, and Tóth 2018). While long-term benefits can alleviate labor market constraints, short- and medium-term responses often involve temporary costs and delays (Duval and Furceri 2018; Bouis et al. 2012). Hence, LPs offer a framework to assess whether short-term outcomes differ from long-term expectations and can reveal implementation costs or 'J-curve' dynamics in output and employment that make it harder to secure overall support for reform proposals.[2]

This thesis adds to the local projection literature by examining the dynamic impacts of the three key labor market policies - employment protection legislation (EPL), active labor market policies (ALMP), and the labor tax wedge (LTW) - on employment outcomes. Using Jordà's (2005) LP approach and a newly created dataset covering 38 OECD member states from 1999 to 2018, it addresses the research question of *how EPL, ALMP, and LTW dynamically influence employment rates over short and medium-term horizons.* By exploiting new OECD indicators, which are examined for the first time using local projections, this thesis offers new insights into the trade-offs between overly rigid EPL regulations and worker protection, as well as into the dynamic reform impacts of changes in ALMP expenditures and the LTW.

This thesis is organized as follows: Chapter 2 reviews the literature on structural reforms, focusing on studies that employ the LP method. Chapter 3 describes the data and empirical approach before Chapters 4 presents, interprets, and discusses the results. Chapter 5 concludes and gives directions for future research.

[2] The original "J-curve" by Magee (1973) refers to trade dynamics. The phenomenon here refers to structural reforms potentially causing short-term costs (e.g., job losses, slower productivity) before yielding benefits.

2. Literature Review: Labor Market Reforms and Local Projections

2.1. Structural Reforms for Growth

Over the past decade, the slowing growth of labor productivity has underscored the need for structural reforms that boost productivity, support economic growth, and improve living standards (OECD 2024e). By altering economic structures and institutions, these reforms aim to enhance the flexibility and dynamics of labor and product markets, which makes them crucial tools for growth and employment (OECD 2017; Wiese, Jalles, and De Haan 2024).

International organizations, like the OECD and the World Bank, regularly identify structural reform priorities to help member countries pursue their long-term, sustainable development progress (OECD 2023; Swaroop 2016). One example, for instance, is the OECD's *Getting Competitive Initiative*, which presents a detailed framework that categorizes reform priorities into five areas, ranging from macroeconomic stability to market efficiency and openness (Figure 1). While each category centers on distinct policy mechanisms, this thesis focuses on reforms related to *Pillar 9: Labor Mobility and Participation* (OECD 2024e).

The indicators outlined under this pillar (Table 3, p.36, Appendix A) aim to highlight incentives that promote both workforce participation and adaptability, while a special focus is given to underrepresented groups, including women, youth, and low-skilled workers (OECD 2024e).

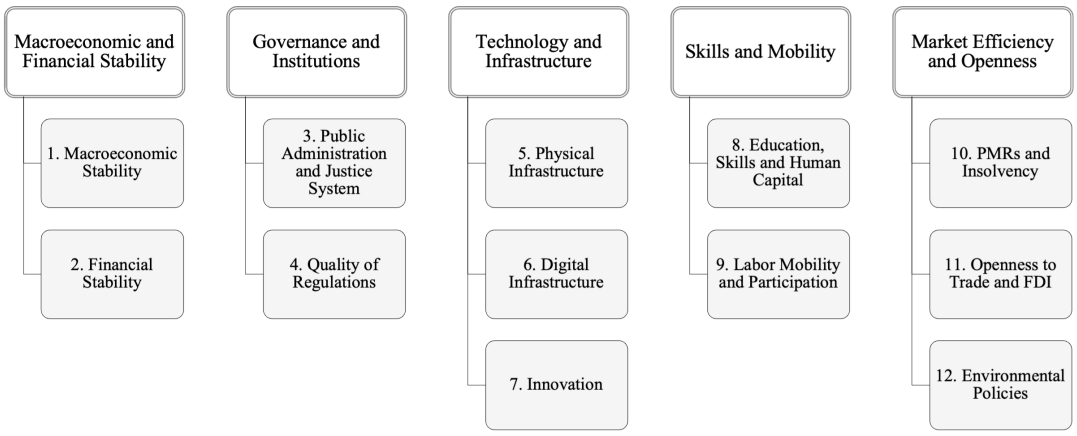

Figure 1: The OECD Getting Competitive Framework
(Source: Self-generated figure based on OECD Indicator Scoping Note, 2024, page 8. (OECD 2024e)).

2.2. Labor Market Policies: Evidence and Expectations

Structural labor market reforms (LMRs) are key measures of the broader reform agenda since they directly address inefficiencies and barriers that hinder employment and labor force participation. While other policies and structural reforms, like product market reforms (PMR) and corporate tax measures, also play an important role, this thesis specifically focuses on the three labor market policies: employment protection legislation (EPL), active labor market policies (ALMP), and the labor tax wedge (LTW). Reforms in these policies target rigidities in the labor market (EPL), enhance workers' skills and employability (ALMP), and lower employment costs (LTW). Therefore, they ultimately enhance labor utilization by raising employment rates (ER) and also ensure that a larger segment of the workforce can actively engage in the labor market (OECD 2017).[3]

Even though the long-term benefits of structural LMRs have been comprehensively documented, their implementation usually involves costs (Campos, De Grauwe, and Ji 2023; Duval and Furceri 2018). To understand these complex dynamics, this literature review combines the theoretical foundations of EPL, ALMP, and LTW policies with evidence derived from studies that utilize the LP approach. This provides a robust basis for the analysis later.

2.2.1. Employment Protection Legislation: Balancing Flexibility and Security

Employment Protection Legislation (EPL) significantly influences employers' decisions around hiring and firing by establishing rules regarding hiring practices, severance payments, or contract conditions (Cazes and Nesporova 2003; OECD 2017). While these regulations provide job security and reduce worker turnover, they may discourage hiring and exacerbate

[3] This thesis focuses exclusively on LMRs affecting labor utilization. The analysis of policies to enhance labor productivity, such as PMRs (which optimize the allocation of resources and reduce worker skill mismatches) and corporate tax restructuring (which incentivize innovation and employment), is beyond its scope. Readers can consult relevant LP literature, including Arin, Devereux, and Mazur (2023), De Haan and Wiese (2022), Duval and Furceri (2018), Borden et al. (2016), Jalles (2024), Cloyne et al. (2022), Bouis, Duval, and Eugster (2016)

labor market segmentation (Ryu 2018; OECD 2017). Hence, by lowering dismissal and hiring restrictions, firms can adjust their workforce more effectively and reallocate resources toward more productive activities. Consequently, there is a common belief that easing EPL rigidity can sustainably improve labor market flexibility and potentially foster sustainable and inclusive economic growth (OECD 2017).

Over the past two decades, many nations have already eased their regulations on non-regular contracts to encourage flexibility in the labor markets. However, the rules on regular contracts remained largely intact, which caused a rise in non-regular contracts and, therefore, contributed further to the issue of labor market dualism and segmentation (OECD 2017). Since workers holding non-regular contracts tend to be younger, are disproportionately affected by economic fluctuations, and experience greater job insecurity, they also face longer and more frequent periods of joblessness, leading to a skill depreciation and lower productivity among this group (Cazes and Nesporova 2003; OECD 2017).

Empirical studies that use local projections to analyze EPL deregulation report mixed outcomes, with effects varying based on the types of contracts, the duality of the labor market, and the prevailing macroeconomic conditions (Bassanini and Cingano 2017). For example, Borden, Ebeke, and Shirono (2016) find that structural reform shocks in EPL for regular workers have a positive but lagged impact on employment creation. Even after controlling for the endogeneity of reform decisions, the positive effect remains and tends to be stronger, with effects becoming significant 4.5 years post-reform. However, the authors also show that transitory costs, such as increased job turnover and temporary unemployment spikes, can occur. This was observed specifically during periods of economic downturns. Additionally, the authors also present evidence that supportive macroeconomic policies can help mitigate the initial adverse effects and therefore, can be used to amplify the noted positive medium-term outcomes (Borden, Ebeke, and Shirono 2016).

Aumond, Tommaso, and Rünstler (2022) observe mild negative short-run responses of EPL reforms on employment and real wages, which aligns with the idea of transitory costs. Their findings show that wage responses to EPL reforms for regular contracts are significant at very short horizons. For temporary contracts, both wage and employment responses approach a significant level after two years. The results further indicate that young and elderly workers mainly bear the burden of short-term adjustment effects. However, the authors also show that during times of economic booms, liberalization tends to boost job opportunities, while it reduces employment during times of low growth (Aumond, Tommaso, and Rünstler 2022).

Bassanini and Cingano (2017) emphasize that labor market frictions hinder the adjustment effects of flexibility-enhancing reforms. Their study reveals that deregulating dismissals for regular workers leads to an immediate reduction in employment, particularly in dismissal-intensive industries. These adverse effects last about a year post-reform before reverting. Additionally, the impacts are more pronounced during economic downturns, while they appear to be negligible in highly segmented markets (Bassanini and Cingano 2017).

Building on these insights, Duval, Furceri, and Jalles (2019) emphasize that labor market reforms are highly sensitive to the business cycle and the macroeconomic stance, with significant short-term variations in employment outcomes. By applying local projections to a narrative database of job protection deregulations for regular workers over four decades, the authors show that employment increases over the medium term in sectors with high layoff rates when they are undertaken during an economic expansion. Conversely, in the short term, employment decreases when reforms are introduced during slack periods, suggesting that they are most effective during booms to avoid short-term losses (Duval, Furceri, and Jalles 2019).[4]

[4] While most studies focus on employment and productivity impacts, Amendola, Ciampa, and Germani (2024) find that deregulating fixed-term contracts leads to a consistent reduction in the wage share, suggesting that increased labor market flexibility through temporary contracts decreases national income going to wages. Ciminelli et al. (2018) further show that job protection reductions increase employment but reduce labor shares.

The literature highlights the ambiguous effects of EPL reforms: While reforms that enhance flexibility can lead to medium-term employment gains, they may also result in higher layoff rates and increased job turnover in the short term. The outcomes also depend on industry characteristics, labor market segmentation, and the current economic conditions. These complexities offer critical insights into the expected dynamic impacts, which are explored later in this master thesis.

2.2.2. Active Labor Market Policies: Supporting Workforce Participation

Active labor market policies (ALMPs) aim to address structural and long-term unemployment by reducing skill mismatches and informational frictions through measures such as vocational training, employment subsidies, and job placement services (Vooren et al. 2019; Crépon and Van Den Berg 2016). These initiatives often target vulnerable groups, including long-term unemployed, displaced workers, and youth, to enhance their skills, employability, and access to quality jobs (Fay 1996). By reducing barriers, ALMPs, therefore, facilitate a faster return to work and foster stable and inclusive employment outcomes, thereby reducing unemployment and improving labor utilization (Causa, Hermansen, and Ruiz 2016; OECD 2017).[5]

Particularly in economies with high long-term or youth unemployment rates, ALMPs are essential for boosting participation and employment as they reduce unemployment by making it more costly to remain without a job. This enhances incentives and increases participation (Borden, Ebeke, and Shirono 2016). Complementary reforms, such as improving unemployment benefits (UB) systems and expanding social protection, can further support this by incentivizing formal employment transitions and facilitating the reintegration into the labor market (European Central Bank 2014; OECD 2017).

[5] Further disparities in LFP persist as many women remain excluded from the labor market or work involuntarily in part-time jobs due to the lack of childcare, disincentives in tax systems, or unequal parental leaves. Integrating minorities into the labor market can result in economic and social benefits while boosting LFP (OECD 2017). However, policies to make the LM more inclusive have not been studied using Jordà's (2005) LP method.

The dynamic effects of ALMP reforms have also been extensively analyzed using the local projection approach, with some studies accounting for the business cycle and prevailing macroeconomic conditions. Bouis et al. (2012) provide evidence that increased spending on employment incentives and training programs generally boosts employment in the short term, especially for women. Nevertheless, they point out difficulties in accurately assessing these effects due to the cyclicality and endogeneity of ALMP spending measures. For instance, the authors note that spending on specific pro-cyclical categories, like public employment services and direct job creation, can produce counterintuitive outcomes in the short term. This is due to the nature of these categories, which increase during downturns and reflect adverse economic conditions rather than the direct effects of ALMP reforms (Bouis et al. 2012).

The medium-term benefits of ALMPs are emphasized by Duval and Furceri (2018), who find that a 10% rise in spending increases employment by approximately 0.3% and boosts output by 0.6-1% within four years. The effects are particularly pronounced during slack periods, which aligns with the idea that these measures often entail fiscal stimulus. However, the positive impact stabilizes after four years and tends to decline in economic upturns, likely due to reduced fiscal multipliers and countercyclical adjustments. The importance of timing and macroeconomic alignment is further supported by Tam and Xu (2024), whose analysis of the Korean labor market reveals that increased ALMP spending during recessions significantly boosts output and employment in the medium term. Conversely, these effects become negative during expansions, likely due to inflationary pressures and subsequent countercyclical policy responses, which aligns with the findings by Duval and Furceri (2018).

Lastauskas and Stakėnas (2020) further emphasize the essential role of accommodative monetary policy in enhancing the effectiveness of ALMPs. They show that ALMPs only reduce unemployment when monetary policy is accommodative. Thus, accommodative monetary policy can alleviate negative impacts and enable LMRs to achieve their objectives more

efficiently. Several local projection studies also show that complementary measures, such as UB reforms, also contribute to labor market improvements, albeit showing varying results. Reducing UB replacement rates can gradually boost medium-term employment, while their effectiveness is also highly dependent on the economic cycle. During recessions, these reforms may initially lead to short-term losses, potentially resulting from weaker demand for labor (Duval and Furceri 2018; Bouis et al. 2012).

Overall, the literature indicates that ALMPs effectively address labor market frictions and can help reduce unemployment in the medium term, especially during downturns. However, the success of reforming ALMPs also heavily depends on its design and the current macroeconomic environment, which further highlights the need for policies to consider specific contexts.

2.2.3. Labor Tax Wedges: Reducing Employment Costs

Labor Tax Wedges (LTW) measure the difference between an employer's total labor costs and the take-home pay by employees, including payroll taxes, social contributions, and personal income taxes (OECD 2024d). LTWs indicate the extent to which taxation on labor income impacts employment by increasing the hiring costs for firms and simultaneously reducing workers' take-home pay. Thus, high LTWs have been associated with inefficiencies in the labor market, particularly among low-skilled and informal sector workers, for whom employment opportunities are more sensitive to tax-related distortions (OECD 2017; Özker 2020; Causa, Hermansen, and Ruiz 2016). Lowering LTWs is, therefore, believed to remove labor distortions, particularly those that are felt by young and low-skilled workers, who also make up a large portion of the informal workforce. Especially high rates of both average and marginal taxes on labor earnings can decrease individuals' labor supply and increase the number of people without jobs. At the same time, high LTWs reduce firms' labor demand by raising labor costs through payroll taxes and mandatory social security contributions (OECD 2017).

Using Jordà's (2005) LP method, Duval and Furceri (2018) estimate the dynamic responses of macroeconomic outcomes to various labor market reforms and counter-reforms. The authors analyze LTW shocks by looking at yearly fluctuations in tax wedges, which they measure as the gap between the employer's labor costs and the after-tax income for a single-earner couple with two kids. Their findings reveal that negative shocks to LTWs have significant positive effects on employment and output in the short and medium term, with the latter effect leveling off seven years after the tax cut. The identified impacts are also more pronounced during economic downturns, suggesting that larger fiscal multiplier effects are prevalent during slack periods (Duval and Furceri 2018). The results emphasize that LTW reforms not only boost employment but also stimulate output, aligning with growth priorities identified by the OECD.

3. Data and Methodological Approach

While the reviewed studies offer valuable insights into the effects of employment protection legislation (EPL), active labor market policies (ALMPs), and the labor tax wedge (LTW), they also highlight the complex and context-specific nature of reform outcomes. Building on these insights, this chapter describes the methodological approach and data sources used to enhance the understanding of short- and medium-term effects on employment rates (ERs) using a newly created panel dataset, as well as indicators derived from the OECD's Getting Competitive Initiative (see Section 2.1.).

3.1. Methodological Approach: Local Projection Method

To assess the dynamic effects of reforms in these labor market policies on employment rates, the analysis applies Jordà's (2005) local projection approach to estimate impulse response functions (IRF) for up to eight years ahead.[6] LPs are widely used for analyzing macroeconomic

[6] Impulse responses assess how one variable in a time series reacts to a sudden change (shock) in another variable over various horizons. The responses then illustrate the impact of the shock on variables in subsequent periods, offering estimates for different future times (Wiesen and Beaumont 2024).

and fiscal shocks and have been extended to a panel data context in studies such as Auerbach and Gorodnichenko (2013). Research demonstrates that LPs offer a flexible alternative to vector autoregressive models (VARs) because they avoid specifying the entire dynamic system of equations for all variables (Alesina et al. 2023). Instead, they directly estimate impulse responses through a series of regressions, which reduces the sensitivity to lag structure choices and the risks of model misspecification that commonly affect VARs (Cloyne et al. 2022).[7]

Additionally, by including crisis indicators, accounting for endogeneity in reform variables, or controlling for both time-varying and time-invariant components, LPs can, therefore, account for non-linear or state-dependent impacts (De Haan and Wiese 2022).

3.1.1. Baseline Model Specification

For each horizon *h*, the baseline local projection model is specified as follows, where *h* indicates the number of years after the shock:

$$y_{i,t+h} = \alpha_i + \beta_h \cdot shock_{i,t} + \phi_{h,1} \cdot y_{i,t-1} + \phi_{h,2} \cdot y_{i,t-2} + \theta_{h,1} \cdot pop_{i,t-1} + \theta_{h,2} \cdot edu_{i,t-} + \gamma_h \cdot shock_{i,t-1} + \varepsilon_{i,t+h} \quad (1)$$

Here, α_i represents country-specific fixed effects, controlling for time-invariant differences across countries. The dependent variable $y_{i,t+h}$ represents the employment rate (ER) of country i at time $t + h$, while $shock_{i,t}$ captures variations in one of the labor market policy indicators: EPL, ALMP, or the LTW (see Appendix, pp. 33-34 for List of Symbols).

Following Alesina et al. (2023), the policy shock indicators are treated as continuous variables to capture the magnitude and direction of their influence. The coefficient β_h represents the non-cumulative impulse response of the employment rate to a one-unit change in the policy level at each horizon h.[8] It is important to note that the estimation relies solely on using the levels of

[7] LPs estimate the conditional mean for each time period, avoiding the complexity of modeling an entire equation system. This makes LPs easier to implement compared to VARs while handling nonlinearities.

[8] Non-cumulative responses indicate that the effect at each horizon h is not aggregated over previous horizons.

the policy indicators directly as shocks rather than their first differences or dummies indicating reform events. This allows for estimating the average impact of variations in EPL strictness, ALMP expenditures, or LTW among countries over time.[9]

To control for the persistence in employment dynamics, the equation includes two lags of the dependent variable ($y_{i,t-1}, y_{i,t-2}$). In addition, lagged population ($pop_{i,t-1}$) and lagged mean years of schooling ($edu_{i,t-1}$) serve as additional controls to capture demographic and human capital factors. In some specifications, the lagged policy variable itself ($shock_{i,t-1}$) was included as a control to help account for delayed reform effects.

The error term $\varepsilon_{i,t+h}$ captures all unobserved factors that influence the ER. It is adjusted using Driscoll and Kraay (1998) standard errors to account for potential serial correlation, heteroskedasticity, and cross-sectional dependence, which often occurs in panel datasets such as ours. The equation is separately estimated for each horizon (h=0,..,8), and IRFs are computed using the β_h coefficients, with 90% confidence bands illustrating significance.

3.1.2. Robustness Checks and Specifications

To ensure the robustness of the results, several alternative specifications and sensitivity analyses were conducted. First, the lag structure of control variables in equation (1) was varied to assess the stability of the estimated IRFs.

Second, the labor force participation rate (LFPR) was used as an alternative dependent variable. Unlike the employment rate, which reflects the percentage of the working-age population currently employed, the LFPR also encompasses individuals actively looking for work (OECD 2024c).

[9] Due to limited variation and missing data in the first difference of EPL, the analysis relies on policy indicators in levels, rather than discrete shocks or reform dummies. Analyzing level changes captures policy stringency or generosity, maximizing data usage and sample size. Many studies utilize a narrative reform dataset by Duval et al. (2018), which considers reforms and counter-reforms using a dummy shock variable.

Another key robustness check involves using dummy variables to capture significant reform events in the ALMP indicator. Differently to baseline model (1), which uses continuous policy indicators in levels, this approach identifies major reform shocks based on extreme changes in ALMP spending. Specifically, a dummy variable was constructed that takes the value *1* for significant positive shocks (top 10th percentile of ALMP changes), *-1* for significant negative shocks (bottom 10th percentile), and *0* otherwise. The percentiles are calculated based on the first difference of the ALMP indicator across countries and years to ensure that the dummy variable solely represents the significant deviations from typical policy adjustments.

The adjusted LP equation for the dummy-shock specification is then given as:

$$y_{i,t+h} = \alpha_i + \beta_h \cdot \text{Dummy\_Shock}_{i,t} + \phi_{h,1} \cdot y_{i,t-1} + \phi_{h,2} \cdot y_{i,t-2} + \theta_{h,1} \cdot \text{pop}_{i,t-1} + \theta_{h,2} \cdot \text{edu}_{i,t-1} + \gamma_h \cdot \text{Dummy\_Shock}_{i,t-1} + \varepsilon_{i,t+h} \quad (2)$$

Finally, to investigate whether tightening and loosening (i.e., decreases and increases in ALMP levels) has different effects, separate models were estimated for these reforms. Hence, splitting the analysis helps to identify whether the labor market responds asymmetrically to changes.

3.2. Database and Structural Reform Dataset

Building on the methodological framework outlined in Section 3.1., a new dataset was constructed. This dataset integrates the three labor market indicators derived from Pillar 9, introduced in Chapter 2.1., alongside various other OECD data sources. It covers a panel of 38 OECD member states from 1999 onwards.[10]

To capture the first-round effects of policy changes, the analysis uses the employment rate (ER) from the OECD infra-annual labor statistics database as its primary outcome variable.[11] To

[10] Appendix B, Table 5 lists the 38 OECD member countries; Table 6 details variables and data sources (p. 38ff.) Additionally, since the inclusion of COVID-19 expenditures in the ALMP indicator caused unusual data spikes, and measures implemented in 2020 were recorded for the fiscal year 2019, data from 2019 onwards is excluded.
[11] The ER is measured as the *percentage of working-age population, age 15-64, calendar and seasonally adjusted*.

examine the dynamic effects of shocks in EPL reforms, the two indicators *EPL for Individual and Collective Dismissal of Regular Workers* (denoted in dataset as 'eprc') and the *Duality of EPL* (denoted as 'EPL_Duality_Version1_2020_abs') are employed as independent variables.

The EPL indicator assesses the stringency of EPL for regular workers. It is sourced from the Employment and Labor Statistics (ELS) Database, as part of the OECD's Getting Competitive Initiative (see Table 4, p.37, Appendix A). It is a score variable from 0 to 6, where lower values indicate a looser level of employment protection. Moreover, the EPL Duality indicator highlights the degree of labor market segmentation by measuring the difference in protection between temporary and regular workers. It is calculated in absolute terms by subtracting the EPL score for temporary workers from the EPL score for regular workers.[12]

In addition to EPL shocks, ALMP and LTW reforms are also analyzed. Both indicators are derived from Pillar 9 of the OECD's Getting Competitive Initiative. The ALMP indicator represents public expenditure on ALMPs, expressed as a percentage of GDP per unemployed person. Thus, it serves as a critical measure of government support (OECD 2024e). Meanwhile, the LTW indicator, included as the average tax wedge, is defined as the sum of employers' and employees' social security contributions, payroll, and personal income taxes minus cash transfers. It is expressed as a percentage of labor costs. By capturing the gap between labor costs and net pay, it reflects the economic incentives for LFP (OECD 2024d). Furthermore, as it is averaged across eight family situations, it accounts for different household structures.

For robustness and sensitivity checks, the dataset includes additional variables, such as population, mean years of schooling, GDP, or labor force participation rate data. These additional variables were retrieved from UNESCO and the OECD Economic Outlook.[13]

[12] Both indicators were sourced from the OECD Employment Protection Legislation Database, 2020 edition.
[13] Mean years of schooling was sourced from UNESCO; The latest OECD Economic Outlook Database (No. 115 Edition 2024/1) can be accessed at https://doi.org/10.1787/eo-data-en. For further information, see Table 6.

4. Results and Discussion

Chapter 4 discusses the findings from the local projection analysis as explained in Chapter 3. It focuses on the dynamic impacts of reforms in EPL, ALMP, and the LTW on employment outcomes. The results are placed in context with the policies' theoretical frameworks and are then related to the existing literature, offering a comprehensive understanding of their effects.

4.1. Employment Protection Legislation and EPL Duality

The estimated impulse response function and coefficients from baseline equation (1), capture the non-cumulative dynamic response of the employment rate to a one-unit increase (shock) in Employment Protection Legislation for regular workers. Measured on a 0-6 scale, EPL reflects the strictness of firing regulations. Even small numerical changes in the EPL indicator represent a significant policy shift, particularly given the gradual and incremental nature of reforms observed across many OECD countries.

Table 1: LP Results: Estimates of EPRC Shock on the ER

H after shock	**Horizon 1**	**Horizon 2**	**Horizon 3**	**Horizon 4**	**Horizon 5**	**Horizon 6**	**Horizon 7**	**Horizon 8**
Estimates	-0.3561	-0.8512	-1.7635	-5.1258***	-6.6823***	-5.2230***	-3.9160***	-1.8626***
	(1.2091)	(1.4481)	(1.1006)	(1.3794)	(1.2386)	(1.3247)	(1.1323)	(0.5756)
t value	-0.2946	-0.5878	-1.6023	-3.7161	-5.3950	-3.9427	-3.4583	-3.2357
Pr(>|t|)	0.7686	0.5573	0.1109	0.0003	0.000	0.0002	0.0009	0.0024
Country FE	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes

Notes: Driscoll-Kraay adjusted robust standard errors are presented in parentheses. ∗∗∗, ∗∗ and ∗ denote 1, 5, and 10% significance levels, respectively.[14]

The results, visualized in Figure 2 and summarized in Table 1, reveal a delayed but significant negative impact of stricter EPL on the ER. While short-term effects (Horizon 1-3) are negative but statistically insignificant, significant effects materialize after four years. Specifically, at Horizon 4, a one-unit increase in EPL reduces the ER by 5.13 percentage points, reaching its

[14] Please note: A one-unit increase in EPL score represents an unrealistically high shift in protection levels. In reality, many reforms involve changes that are much smaller than one unit. Thus, real-world effects and their impacts on the ER must be scaled accordingly: For instance, Spain's massive labor market reform in 2012 reduced EPL from 2.21 (2012) to 1.96 (2013) (-0.25) (OECD 2024a).

peak negative impact at Horizon 5 (-6.68 percentage points). The effect is statistically significant at the 1% level and the confidence intervals, as shown in Figure 2, are relatively narrow, which provides additional support for the robustness of the findings. While the magnitude of the negative effects diminishes over time, the impacts remain significant, with reductions of -3.92 percentage points at Horizon 7 and -1.86 percentage points at Horizon 8.

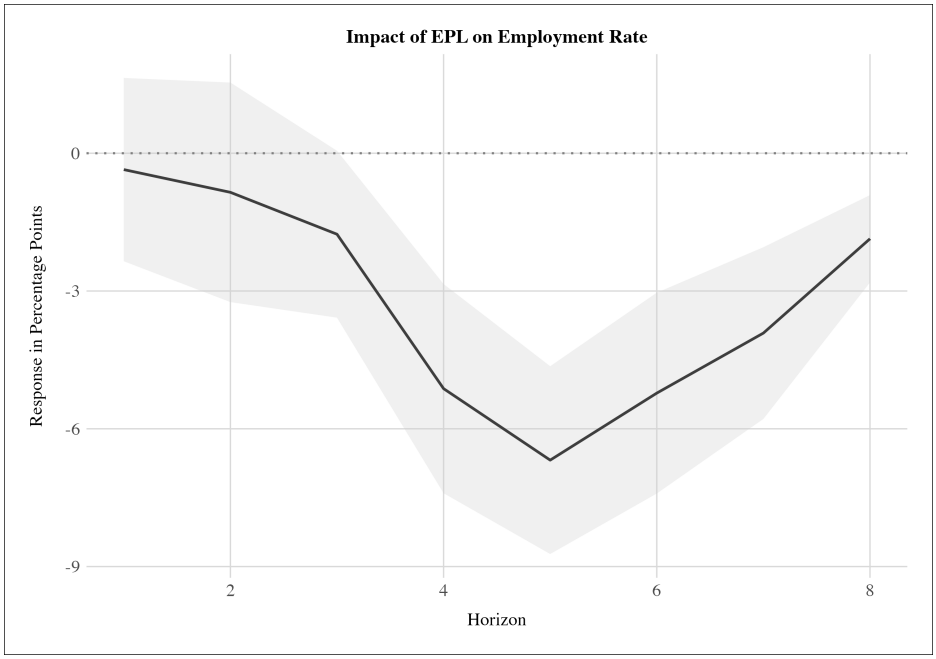

Figure 2: IRF of the ER to a Shock in EPL
Notes: IRF shows the effect of a one-unit shock in the EPL score on the ER for individuals aged 15-64. The model includes controls for lags of the ER, population, mean years of schooling, and EPL. Analysis uses Driscoll-Kraay standard errors to account for heteroscedasticity and cross-sectional dependence. The response is measured in percentage points over an 8-year horizon, with 90% confidence intervals.

The delayed response in the employment rate might reflect adjustment costs and regulatory uncertainties firms face, which are associated to the stricter protection levels for regular workers. Firms may delay their hiring or restructuring decisions to account for potential higher dismissal costs and to avoid short-term disruptions (OECD 2017). This is consistent with labor market adjustment cost theories that highlight a gradual adaptation of employment to regulatory changes associated with hiring and firing costs, as well as turnover expenses (Nickell 1986).

The observed significant medium-term reductions can potentially be attributed to the just-mentioned increase in hiring and firing costs that discourage job creation and limit a firm's

capacity to respond to economic fluctuations (Ryu 2018). This dynamic aligns with economic theory, which suggests that overly stringent regulations may discourage hiring and exacerbate labor market segmentation, leading to a decrease in labor market flexibility and efficiency (OECD 2017). Furthermore, the persistence of adverse effects in the long term, as shown by the IRF at Horizon 7 and 8, underscores that reforms in employment protection legislation are indeed of a structural nature, as they place the economy on a different path (Figure 2). Consequently, the sustained effects imply that labor market inefficiencies remain even as firms and workers slightly adjust over time.

Robustness checks confirm the reliability of the baseline findings. Omitting the lagged EPL control variable amplifies the estimated effects, with sharper declines observed compared to the baseline result (Figure 6, Table 9, p.43, Appendix D). This highlights that previous policies significantly influence labor market outcomes and underscores the need to consider past dynamics when analyzing reform impacts. However, the broader confidence intervals suggest heightened uncertainty and potential omitted variable bias. Using the LFPR as an alternative dependent variable reveals a smaller and less pronounced response compared to the ER in baseline model (1). While the general trend of the IRFs follows a similar pattern, the magnitude of the effect is notably weaker. This suggests that EPL reforms mainly influence employment outcomes rather than overall labor market participation (Figure 7, Table 10, p.44).

While the lagged reform impact of EPL changes aligns with earlier studies, such as those of Borden, Ebeke, and Shirono (2016), who identify ‘J-curve’ patterns as well as significant medium-term reform effects, it is important to note that these prior local projections studies mainly focus on analyzing deregulation shocks. Accordingly, the adverse effects of an increase in EPL rigidity observed in this study cannot serve as the sole basis for recommending flexibility-enhancing reforms, as it is reasonable to assume that the relationship between EPL and employment is likely to be asymmetric. Furthermore, it is essential to acknowledge that

most prior local projection studies also include interaction terms to account for macroeconomic conditions, which was not part of the analysis. This omission may explain differences between this study's findings and prior research, and potentially overlooks additional insights (see Duval, Furceri, and Jalles 2019; Bassanini and Cingano 2017).

A secondary analysis also explored the role of EPL duality, which is measured as the absolute difference between protection levels for regular and temporary workers. High EPL duality indicates a greater segmentation of the labor market, as regular workers benefit from stronger protection levels relative to temporary workers (OECD 2017).

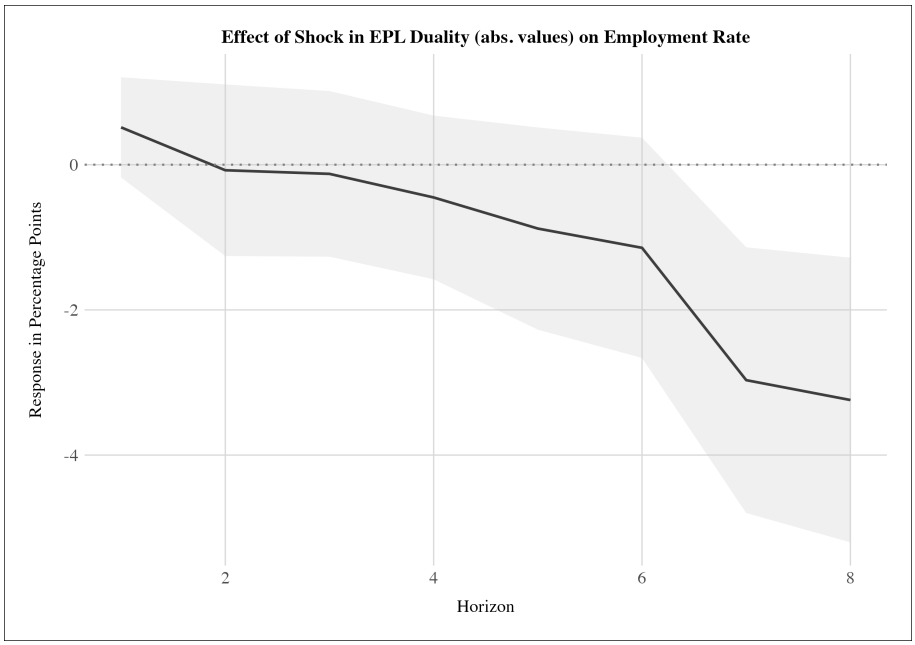

Figure 3: IRF of the ER to a Shock in EPL Duality
Notes: IRF shows the effect of a one-unit shock in EPL duality (abs. values) on the ER. See Appendix D.

The results in Figure 3 and Table 11 (p.45, Appendix D) reveal that a one-unit increase in EPL duality significantly reduces employment rates by Horizon 6, with the ER declining by more than 3 percentage points at Horizon 8. Although the findings are less powerful compared to sole EPL shocks, as evidenced by the wide confidence intervals in Figure 3, they highlight the negative and delayed effects of segmentation on employment levels at late horizons. Firms may gradually adjust to reforms by replacing permanent roles with temporary contracts in order to avoid the stricter regulations for regular employees. These actions worsen segmentation, reduce

aggregate employment, and can have disproportionate impacts on vulnerable populations. This aligns with the policy recommendation from the OECD, that highlights the inefficiencies and social costs associated with highly segmented labor markets (OECD 2017).

4.2. Active Labor Market Policies

The findings on EPL reforms emphasize the structural nature of these policies and highlight their significant medium-term impacts on employment rates. In contrast, reforms in ALMPs display more immediate short-term effects on employment outcomes.

The results presented in Table 2 represent the estimated coefficient (β_h) from the local projection model (1) and reflect the dynamic responses of the ER to a one-unit shock in ALMP spending. A one-unit shock, equivalent to a 1 percentage point increase in ALMP expenditure relative to GDP per unemployed, reveals a statistically significant and positive effect on employment rates in the short term, with the most substantial impacts materializing within the first two to three years after a policy change.

Table 2: LP Results: Estimates of ALMP Shock on the ER

H after shock	**Horizon 1**	**Horizon 2**	**Horizon 3**	**Horizon 4**	**Horizon 5**	**Horizon 6**
Estimates	0.1504***	0.2978***	0.2971***	0.1872***	0.0922*	-0.0266
	(0.0099)	(0.0253)	(0.0523)	(0.0501)	(0.0541)	(0.0373)
t value	15.1495	11.7526	5.6819	3.7404	1.7033	-0.7132
Pr(>|t|)	0.000	0.000	0.000	0.0002	0.0900	0.4767
Country FE	Yes	Yes	Yes	Yes	Yes	Yes

Notes: Driscoll-Kraay adjusted robust standard errors are presented in parentheses. ∗∗∗, ∗∗ and ∗ denote 1, 5, and 10% significance levels.

As shown in Table 2, a one-unit shock in ALMP expenditure increases the ER by 0.15 percentage points at Horizon 1. This effect doubles to an increase of 0.30 percentage points at Horizon 2 before stabilizing at Horizon 3. These results are statistically robust, as indicated by the narrow confidence intervals in Figure 4 and the p-values in Table 2, and highlight the effectiveness of ALMP reforms in driving measurable and immediate boosts in employment.

This finding aligns with the theoretical expectations outlined in Chapter 2, where increased ALMP funding was projected to improve job matching and incentivize hiring, by enhancing labor market adaptability and reducing skill mismatches through measures such as vocational training or job placement services (European Central Bank 2014; Crépon and Van Den Berg 2016). The observed short-term employment boosts are also consistent with Bouis et al.'s (2012) empirical findings, who emphasize the role of targeted subsidies and training programs in driving short-term employment gains.

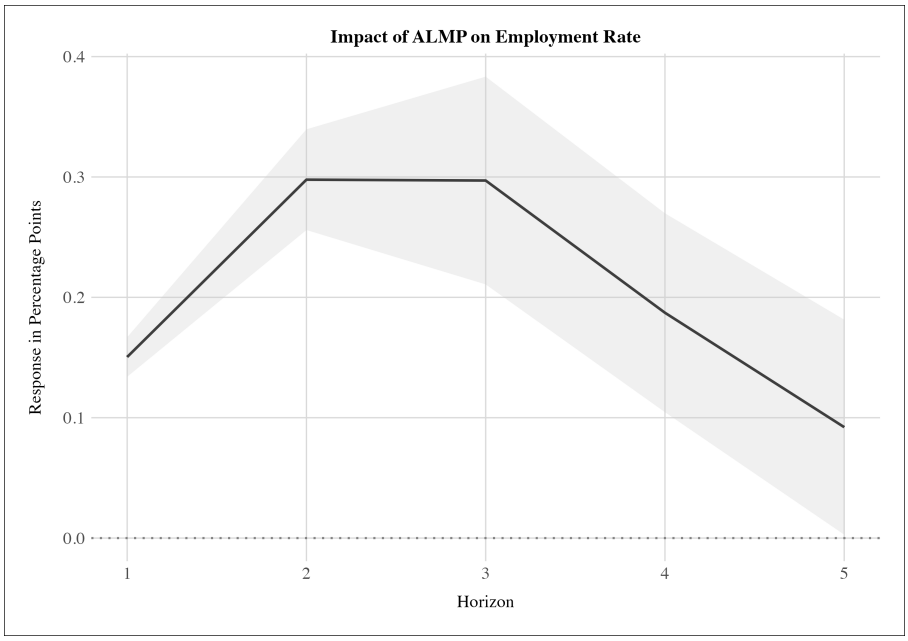

Figure 4: IRF of the ER to a Shock in ALMP
Notes: The IRF shows the effect of a one-unit shock in ALMP on the ER with control variables. The analysis uses Driscoll-Kraay standard errors, and the response is measured in percentage points over a 5-year horizon, with 90% confidence intervals.

However, as shown by the estimates in Table 2 and the impulse response function in Figure 4, the positive effects of ALMP shocks diminish over time. While employment gains remain statistically significant at Horizon 4, they taper off afterwards and become insignificant by Horizon 6. This gradual decline suggests that while increases in ALMP spending can temporarily boost employment rates, their impacts are not sustained over time. These diminishing effects are aligned with Duval and Furceri's (2018) findings who report that ALMP induced employment gains stabilize after four years, even though their effectiveness varies

depending on the macroeconomic stance. This decline in reform impact may reflect potential reform fatigue and diminishing returns of the increased spending levels. However, even when employment effects are solely of a temporary nature, ALMPs may generate broader positive externalities that are not analyzed in this thesis. For instance, vocational training programs can also enhance skill development and improve labor mobility, impacting high-growth industries, tax income, or wages, among others (Fay 1996).

To validate the findings, a robustness check was conducted using dummy variables to capture significant ALMP reform events. These were defined as changes exceeding the top 10^{th} and bottom 10^{th} percentiles of ALMP spending variations across countries and years. Unlike the baseline approach, which analyzes level changes, this method isolates the effects of major reform events, as specified in equation (2). This allows for a clearer identification of the dynamic responses to substantial ALMP changes. The results, shown in Figure 8 (p.46, Appendix D), confirm the observed dynamics of shocks in ALMPs as discussed earlier.

Another robustness check distinguishes between positive and negative ALMP shocks to explore the asymmetry in reform impacts, as illustrated by the IRFs in Figure 5. The estimates show that significant positive ALMP reforms across OECD countries yield moderate but short-lived employment gains. Specifically, as shown in the left panel of Figure 5, the significant positive impact on the ER peaks at Horizon 2 before gradually declining in subsequent periods. This reinforces the conclusion that increased ALMP spending effectively boosts employment in the short term. Conversely, significant reductions in ALMP spending, as shown in the right panel of Figure 5, reveal a sharper and more persistent impact on employment. At Horizon 2, a significant negative shock reduces the ER by more than two percentage points before showing signs of recovery in later horizons. This asymmetry underscores potential risks associated with abrupt spending cuts since labor markets tend to react more strongly and persistently to reductions than to increases. This outcome reflects the importance of considering the negative

consequences of sudden support withdrawals, as they might also disproportionately affect vulnerable groups that rely on these programs (Fay 1996).

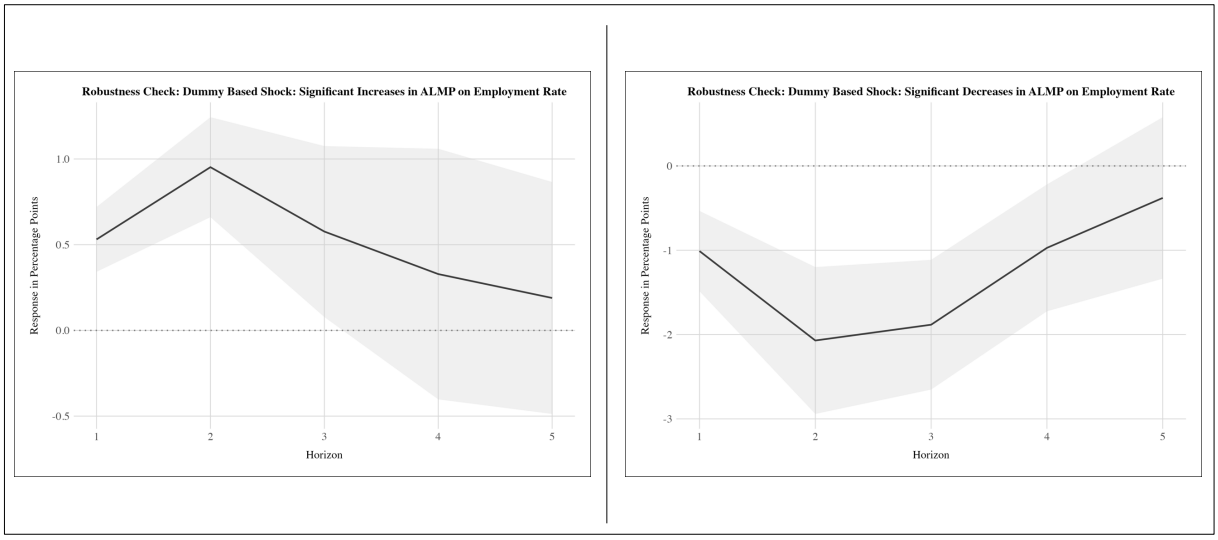

Figure 5: Robustness Check: IRF of the ER to Significant Positive and Negative ALMP Shocks
Notes: The IRFs display the responses of the ER to significant increases (left panel) and decreases (right panel) in ALMP, measured as percentage points over a 5-year horizon. Significant shocks are identified using dummy variables for the top 10^{th} and bottom 10^{th} percentiles of changes in the ALMP expenditure per unemployed. Models include controls for lags of ER, population, mean years of schooling, and ALMP.

4.3. Labor Tax Wedges

Although the LTW was included as a key policy indicator, the estimation results were inconclusive. Despite applying the same methodological approach as for the EPL and ALMP indicators, the IRFs did not provide economically meaningful or statistically significant insights. This outcome is surprising, as prior studies, such as Duval and Furceri (2018) highlight that reducing LTWs can positively impact employment by reducing hiring costs and increasing workers' disposable income, thereby stimulating labor demand and supply (OECD 2017).

Several factors may explain the inconclusive findings: First, limitations in the data, such as a low variability in the LTW indicator and challenges in the shock identification approach can obscure estimated impacts. Additionally, the aggregation of the LTW across eight family types likely masks heterogeneous policy responses, since specific household groups - such as low-income households or secondary earners - tend to respond more sensitively to changes in the

tax system (Blundell, Walker, and Bourguignon 1988). Consequently, future studies could focus their analysis on subgroups, such as the LTW indicator for households where the principal earner earns 67% of the average wage. Shocks in this indicator might result in clearer employment effects.

Thirdly, interactions with other fiscal policies or macroeconomic conditions might have also influenced the results. For example, complementary reforms, such as ALMP adjustments or periods of economic slack, could either amplify or offset dynamic reform effects, potentially leading to omitted variable bias. In addition to the limitations above, the indicator itself may also constrain the analysis. Although the average tax wedge offers a broad measure, it may not fully capture important behavioral incentives that affect employment rates. Consequently, future studies may consider using the marginal tax wedge instead, which could offer different and more nuanced insights into the dynamic short and medium-run effects.

5. Conclusion

The impact of structural labor market reforms on employment outcomes remains a topic of ongoing debate, particularly in light of persistent labor market challenges and slow economic growth. This thesis contributes to this discussion by analyzing how employment protection legislation (EPL), active labor market policies (ALMPs), and the labor tax wedge (LTW) dynamically influence employment rates across 38 OECD countries using local projections.

The results show that stricter EPL reduces employment rates in the medium term by increasing labor market rigidity, which discourages hiring and limits firms' ability to adapt to economic changes. Simultaneously, EPL duality – resulting from an unequal level of protection for regular and temporary workers – raises segmentation and labor market duality, contributing to long-term declines in ERs. In contrast, ALMP reforms only yield short-term employment gains that diminish after four years, highlighting their role as a temporary stabilizing measure. While

increased ALMP spending effectively supports employment in the short term, significant cuts have sharper and more persistent negative effects, which highlights the asymmetry in policy impacts. For LTWs, the results remain inconclusive, likely due to data limitations.

The results underscore the need for balanced and targeted policy responses to foster sustainable and inclusive labor market growth. Reducing EPL rigidity, as supported by prior research, can potentially enhance employment rates in the medium term. At the same time, addressing EPL duality through balanced reforms - such as harmonizing protection levels or incentivizing permanent contracts - should be a priority to reduce labor market segmentation. Moreover, ALMPs should be used as stabilizing tools, for instance, during economic downturns, while their diminishing effects necessitate a careful design and sustained support.

However, the study also faces limitations that must be addressed by future research. First, the use of continuous policy indicators as a shock variable limits the identification of large-scale reforms and only estimates the average impacts of variations in EPL levels. Second, to address potential endogeneity concerns from reforms implemented during crises, future research could explore state-dependent effects and address reform shock endogeneity using IV approaches or augmented inverse probability weighted estimators. Additionally, examining interactions between different reforms, such as interactions with other labor markets or even product market reforms, can potentially reveal complementary effects and offsetting dynamics. Furthermore, demographic factors and institutional contexts, such as age, skill level, or industry size, could also influence effects and uncover important dynamics for policy design and structural reform prioritization.

In conclusion, this thesis offers new insights into the dynamic effects of structural labor market reforms and provides evidence on the timing and magnitude of reform impacts. The findings contribute to the ongoing debate on how to design balanced reforms that foster sustainable and inclusive labor market growth.

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Appendix: List of Abbreviations

ALMP	Active Labor Market Policies
e.g.	"for example"
ELS	Employment and Labor Statistics
EPL	Employment Protection Legislation
ER	Employment Rate
i.e.	"that is"
IRF	Impulse Response Function
IV	Instrumental Variable
LFP	Labor Force Participation
LM	Labor Market
LMR	Labor Market Reform
LP	Local Projection
LTW	Labor Tax Wedge
OECD	Organisation for Economic Co-Operation and Development
OVB	Omitted Variable Bias
PMR	Product Market Reform
R&D	Research and Development
TFP	Total Factor Productivity
UB	Unemployment Benefit
VAR	Vector Autoregression

Appendix: List of Symbols

Dependent Variable:

$y_{i,t+h}$	Dependent variable in country i at time t+h periods after the shock.

Independent Variables:

$shock_{i,t}$	Labor market policy indicator applied to country i at time t (e.g. EPL, ALMP, LTW).
$Dummy\_Shock_{i,t}$	Binary shock variable indicating significant reform events.

Control Variables and Lags:

$y_{i,t-1}$	First lag of the dependent variable (e.g. ER or LFPR).
$y_{i,t-2}$	Second lag of the dependent variable (e.g. ER or LFPR).
$shock_{i,t-1}$	First lag of the independent variable (e.g. labor market policy indicator).
$Dummy\_Shock_{i,t-1}$	First lag of the binary shock variable.
$pop_{i,t-1}$	First lag of population.
$edu_{i,t-1}$	First lag of mean years of schooling.

Coefficients:

$\alpha_{i,}$	Country-specific fixed effects for country i.
β_h	Coefficient of interest: measures the effect of the shock on the dependent variable y at horizon h.
$x_{i,t-k}$	Vector of control variables for country i at time t.
$\phi_{h,1}$	Coefficient for first lag of the dependent variable at each horizon h.
$\phi_{h,1}$	Coefficient for second lag of dependent variable at each horizon h.
$\theta_{h,1}$	Coefficient for first lag population at each horizon h.
$\theta_{h,1}$	Coefficient for first lag of mean years of schooling at each horizon h.
γ_h	Coefficient for first lag of the independent variable at each horizon h

Error Term:

$\varepsilon_{i,t+h}$	Error term capturing all unobserved factors influencing ER or LFPR.

Indices:

i	Country identifier.
t	Time period when shock occurs.
h	Forecast horizon; number of time periods after t for which the effect of the shock is estimated.

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Appendix A: OECD's Labor Mobility and Participation Pillar

Table 3: Indicators: Labor Participation and Mobility:

Source: Self-generated table based on OECD Indicator Scoping Note, 2024, page 22:

Table 3: OECD Indicators: Labor Participation and Mobility

Variable name	Source	Countries	Latest year available
Workforce Participation Incentives			
Implicit tax rate to return to work (% of gross earnings in new job)	ELS	40	2022
Current retirement age	ELS	51	2022
Average tax wedge, couple with 2 children, first earner at 100% and average of 0%, 67% and 33% for the second earner	ELS	36	2022
Proportional difference in net transfers to government between single-earner and equal dual-earner couple households: households' earnings at 33% of average earnings	ELS	52	2014
Length of paid maternity, parental and home care leave available to mothers in weeks	ELS	52	2022
Length of paid paternity and parental leave reserved for fathers in weeks	ELS	52	2022
Women as a share of all 16–24-year-olds who can program	STI	33	2023
Adaptability and Mobility			
Active Labor Market Policies (ALMPs) per unemployed, % of GDP per capita	ELS	35	2021
Employment Protection Legislation (EPL) - Collective dismissals of regular workers	ELS	42	2019
Employment Protection Legislation (EPL) - Individual dismissals of regular workers	ELS	42	2019
Employment Protection Legislation (EPL) - Temporary contracts	ELS	37	2019
Taxes on financial and capital transactions (% of GDP)	CTP	108	2022
Rent control Indicator	ECO / ELS	37	2021
Tenant-Landlord Relation Indicator	ECO / ELS	34	2021
Additional indicators for consideration			
Top marginal tax rates, Personal income tax & employee social security contributions (All-in rate)			
Public expenditure on in-kind benefits for families, % of GDP			

Table 4: Indicator Codes: Variable Description - Pillar 9:

Source: Self-generated table based on OECD Indicator Scoping Note, 2024:

Table 4 outlines the complete set of indicators derived from Pillar 9 of the OECD's Getting Competitive Initiative, providing a detailed perspective on various factors that affect labor mobility and participation. All indicators are gathered within a newly developed data platform by the OECD's Economics Department, an open-source database that aggregates all existing statistics on competitiveness. As of 2022, this platform includes data from 45 to 50 countries, comprising 215 indicators and approximately 180.000 data points (OECD 2024e).

Table 4: OECD Indicator Codes: Variable Description

Code Variable	Variable name	Source	Countries	Latest year available
	Workforce Participation Incentives			
imptax_cc	Implicit tax rate to return to work (% of gross earnings in new job)	ELS	40	2022
retire_age	Current retirement age	ELS	51	2022
atw	Average tax wedge (% labour costs): average over different family situations	CTP	38	2023
neutrality	Difference in net transfers to government between single-earner and equal dual-earner couple	ELS	52	2023
mater_leave	Length of paid maternity, parental and home care leave available to mothers in weeks	ELS	38	2022
father_leave	Length of paid paternity and parental leave reserved for fathers in weeks	ELS	38	2022
wom_prog	Women as a share of all 16–24-year-olds who can program	STI	33	2023
ub	Degressivity of unemployment benefits	ELS		2023
	Adaptability and Mobility			
almp	Active Labour Market Policies (ALMPs) per unemployed, % of GDP per capita	ELS	35	2021
eprc	Employment Protection Legislation (EPL) - Individual and collective dismissals of regular workers	ELS		2019
epl_duality	Duality of Employment Protection Legislation (EPL) - Difference between Individual and collective dismissals of regular workers and temporary workers	ELS		2019
hous_rent	Rent control Indicator	ECO / ELS	37	2021
hous_landlord	Tenant-Landlord Relation Indicator	ECO / ELS	34	2021
	Implicit tax rate to return to work (% of gross earnings in new job)	ELS	40	2022
	Additional indicators for consideration			
	Top marginal tax rates, Personal income tax & employee social security contributions (All-in rate)			
	Public expenditure on in-kind benefits for families, % of GDP			

Appendix B: Dataset

Appendix B.1: Country Coverage in Final Dataset and LP Analysis

Table 5 lists the 38 current OECD member states. The final panel dataset used for the local projection analysis includes data from the listed countries below from 1999-2018.

Table 5: Final Dataset: Country Coverage

Final Dataset - Country Coverage
Australia, Austria, Belgium, Canada, Chile, Colombia, Costa Rica, Czechia, Denmark, Estonia, Finland, France, Germany, Greece, Hungary, Iceland, Ireland, Israel, Italy, Japan, Korea, Latvia, Lithuania, Luxembourg, Mexico, Netherlands, New Zealand, Norway, Poland, Portugal, Slovak Republic, Slovenia, Spain, Sweden, Switzerland, Türkiye, United Kingdom, United States.

Appendix B.2: Data Sources and Additional Information

As mentioned in Chapter 3, Table 6 offers additional information on the variables and their corresponding data sources. The raw data, Stata codes to clean and merge the datasets, and the final datasets can be made available upon request.

Since not all variables were required for the LP analysis, the raw and final datasets include additional variables not detailed in the table, such as the *implicit tax rate to return to work in % of gross earnings in a new job and the GDP volume in USD at constant PPP*, among others..

Table 6: Final Dataset: Sources and Variable Definitions

Indicator Name	Series Name	Short Definition	Source
ALMP	Pillar 09 - Active Labor Market Policies (ALMPs) per unemployed, % of GDP per capita.	See Table 3, Appendix A: Public expenditure on ALMP Programmes per unemployed; % GDP per capita.	See Table 3, Appendix A: ELS OECD Getting Competitive Initative.
ATW	Pillar 09 - Average tax wedge (% labor costs): averaged over different family situations.	See Table 3, Appendix A: Personal income tax + employee and employer social security contributions + payroll tax less cash transfers; % of labor costs (labor costs are sum of gross wage earnings, employers' social security contributions and payroll taxes); Indicator averaged over 8 family situations.	See Table 3, Appendix A: CTP OECD Getting Competitive Initative.
EPR (needed to calculate EPL_Duality_ Version1_202 0_abs)	Summary Indicators: EPR, Version 1	EPL Dismissal for Regular Workers.	OECD Employment Protection Legislation Database, 2020 edition.
*EPT (needed to calculate ELP_Duality_*	Summary Indicators: EPT, Version 1	EPL Dismissal for Temporary Workers.	OECD Employment Protection Legislation Database, 2020 edition.

Version1_2020_abs)			
EPRC	Pillar 09 - Employment Protection Legislation (EPL) – Version 3 of the indicator is used (EPRC)	See Table 3, Appendix A: Individual and collective dismissals of regular workers.	See Table 3, Appendix A: ELS OECD Getting Competitive Initative.
ER_15to64	Employment Rate	Employment rate aged 15 to 64 years, Frequency: Annual, Unit of measure: % of working age population in the same subgroup; Calendar and seasonally adjusted.	OECD Infra-Annual Labor Statistics; Data is drawn from Labor Force Surveys, based on definitions provided by the 19th Conference of Labor Statisticians 2013.
LFPR	Labor force participation rate, as a percentage of population aged 15-64	Labor force participation rate, as a percentage of population aged 15-64, Frequency: Annual	OECD Economic Outlook 115 (2024/1): OECD.ECO.MAD:DSD_EO@DF_EO(1.1)
mean_years_schooling	UIS: Mean years of schooling (ISCED 1 or higher), population 25+ years, both sexes	Average number of years of education (primary/ISCED 1 or higher) completed by a country's adult population (25 years and older), excluding years spent repeating grades.	UNESCO Institute for Statistics: UIS.EA.MEAN.1T6.AG25T99
POP1574	Working-age population, age 15-74	Working-age population, Frequency: Annual, Unit of measure: Persons	OECD Economic Outlook 115 (2024/1)

Appendix C: Methodology and Local Projections in RStudio

LPIRFS R-package by Adämmer (2019) to compute IRFs with LPs

To compute the Impulse Response Functions with local projections for our newly created panel dataset, we utilize the LPIRFS R-package Adämmer (2019). For an introduction to the package as well as examples and replications, the reader is advised to access the R Journal Vol. 11/2, December 2019. A detailed explanation of its usage, specifically for different datasets, is further explained in Adämmer (2019) <doi:10.32614/RJ- 2019-052>.

Table 7 contains an excerpt of the R-Studio code written for this thesis to estimate linear IRFs for the constructed panel dataset. The complete code can be made available upon request.

Table 7: RCode Example: *LPIRFS* Package

```
lp_lin_panel(data_set = AllData,
                        endog_data = "ER_15to64",
                        cumul_mult = FALSE,
                        shock = "EPRC",
                        diff_shock = FALSE,
                        panel_model = "within",
                        panel_effect = "individual",
                        robust_cov = "vcovSCC",
                        use_gmm = FALSE,
                        c_exog_data = c("lag1_ER", "lag2_ER", "lag1_population",
  "lag1_mean_schooling"),
                        hor=8,
                        confint=1.65)
```

Appendix D: Results from the Local Projections

Baseline Result EPL: EPRC Shock on the ER with control variables (lag 1 ER, lag 2 ER, lag 1 Population, lag 1 Mean Years of Schooling, lag 1 EPRC):

Table 8: LP Results: Estimates of EPRC Shock on the ER

H after shock	**Horizon 1**	**Horizon 2**	**Horizon 3**	**Horizon 4**	**Horizon 5**	**Horizon 6**	**Horizon 7**	**Horizon 8**
Estimates	-0.3561	-0.8512	-1.7635	-5.1258***	-6.6823***	-5.2230***	-3.9160***	-1.8626***
	(1.2091)	(1.4481)	(1.1006)	(1.3794)	(1.2386)	(1.3247)	(1.1323)	(0.5756)
t value	-0.2946	-0.5878	-1.6023	-3.7161	-5.3950	-3.9427	-3.4583	-3.2357
Pr(>|t|)	0.7686	0.5573	0.1109	0.0003	0.000	0.0002	0.0009	0.0024
Country FE	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes

Notes: Driscoll-Kraay adjusted robust standard errors presented in parentheses. ∗∗∗, ∗∗ and ∗ denote 1, 5, and 10% significance levels.

Please note: a one-unit increase in EPRC represents a notable shift from a moderate to a relatively strict level of employment protection (e.g., a change from a score of 2 to 3 since EPRC is a scale variable ranging from 0-6). In reality, many political reforms involve less than one unit changes. Hence, real-world effects need to be scaled accordingly.

Sensitivity Analysis EPL: EPRC Shock on the ER without lag of EPRC:

The lagged EPRC variable was omitted in a sensitivity analysis. This was done to test the immediate, undiluted impact of changes in the EPRC score without accounting for its own past values.

Table 9: LP Results: Sensitivity Analysis: Estimates of EPRC Shock on the ER

H after shock	**Horizon 1**	**Horizon 2**	**Horizon 3**	**Horizon 4**	**Horizon 5**	**Horizon 6**	**Horizon 7**	**Horizon 8**
Estimates	-2.2655**	-6.4719***	-7.6794***	-8.8908***	-9.2479***	-8.2600***	-6.8651***	-4.7408***
	(0.9179)	(0.9747)	(0.9675)	(1.4890)	(1.4101)	(0.9966)	(1.5369)	(1.4817)
t value	-2.4682	-6.6402	-7.9372	-5.9708	-6.5581	-8.2885	-4.4668	-3.1995
Pr(>|t|)	0.0143	0.000	0.000	0.000	0.000	0.000	0.000	0.0021
Country FE	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes

*Notes: Driscoll-Kraay adjusted robust standard errors presented in parentheses. ***, ** and * denote 1, 5, and 10% significance levels, respectively.*

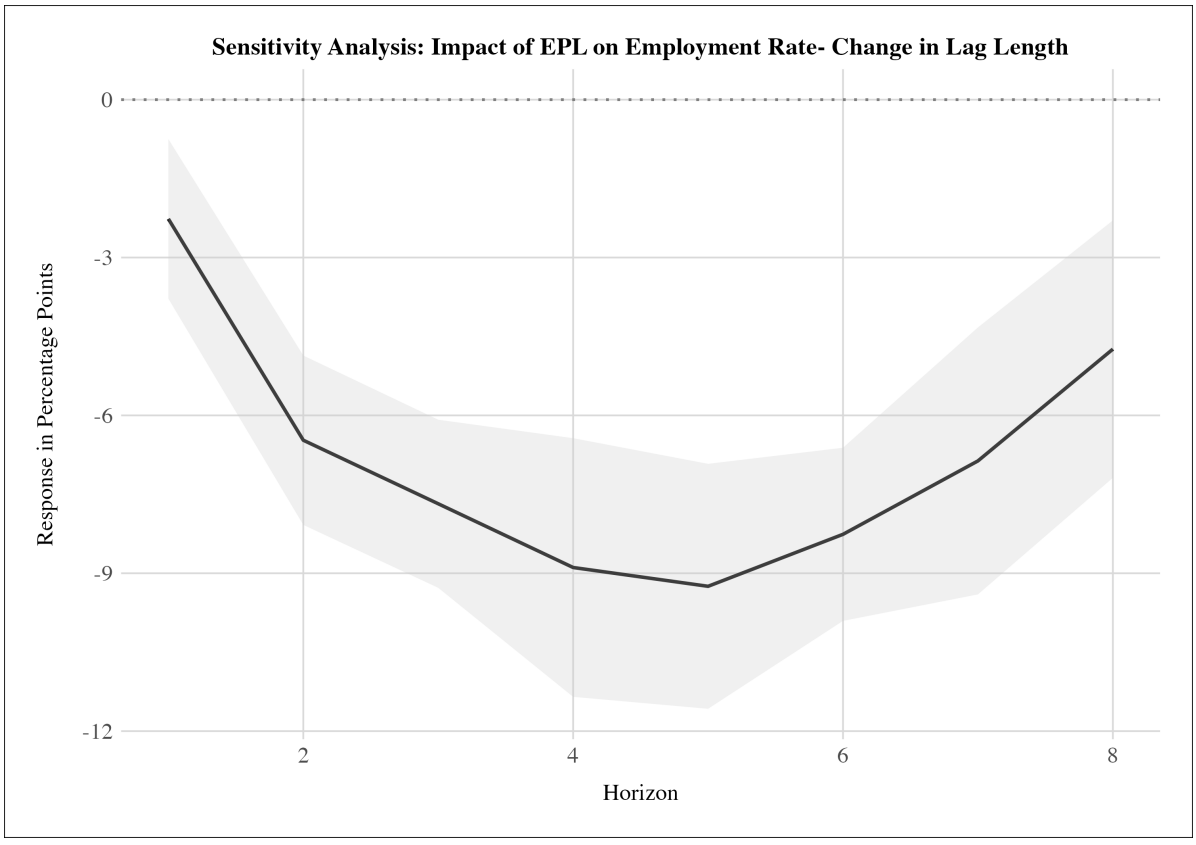

Figure 6: Sensitivity Analysis: IRF of the ER to a Shock in EPL

Notes: The IRF shows the effect of a one-unit shock in the EPRC score on ER. Compared to the baseline model, this model excludes the lagged EPRC variable as a control. The analysis uses Driscoll-Kraay standard errors, and the response is measured in percentage points over an 8-year horizon, with 90% confidence intervals. The x-axis represents the time horizon (in years), while the y-axis shows the estimated change in the ER (in percentage points).

Secondary Analysis EPL: EPRC Shock on the LFPR with control variables (lag 1 LFPR, lag 2 LFPR, lag 1 Population, lag 1 Mean Years of Schooling, lag 1 EPRC):

To assess broader labor market dynamics beyond the ER, the LFPR was used as an alternative dependent variable. This captures how stricter EPRC affects overall labor market engagement, including those actively seeking work.

Table 10: LP Results: Estimates of EPRC Shock on the LFPR

H after shock	**Horizon 1**	**Horizon 2**	**Horizon 3**	**Horizon 4**	**Horizon 5**	**Horizon 6**	**Horizon 7**	**Horizon 8**
Estimates	-0.5044	-0.6345	-0.3685	-1.4448**	-1.4154***	-1.3623***	-1.1927***	-0.5517
	(0.3387)	(0.3357)	(0.5656)	(0.6365)	(0.5381)	(0.2427)	(0.1476)	(0.4624)
t value	-1.4889	-1.8901	-0.6516	-2.2700	-2.6304	-5.6143	-8.0827	-1.1931
Pr(>|t|)	0.1379	0.0602	0.5155	0.0247	0.0097	0.000	0.000	0.2395
Country FE	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes

Notes: Driscoll-Kraay adjusted robust standard errors presented in parentheses. ∗∗∗, ∗∗ and ∗ denote 1, 5, and 10% significance levels, respectively.

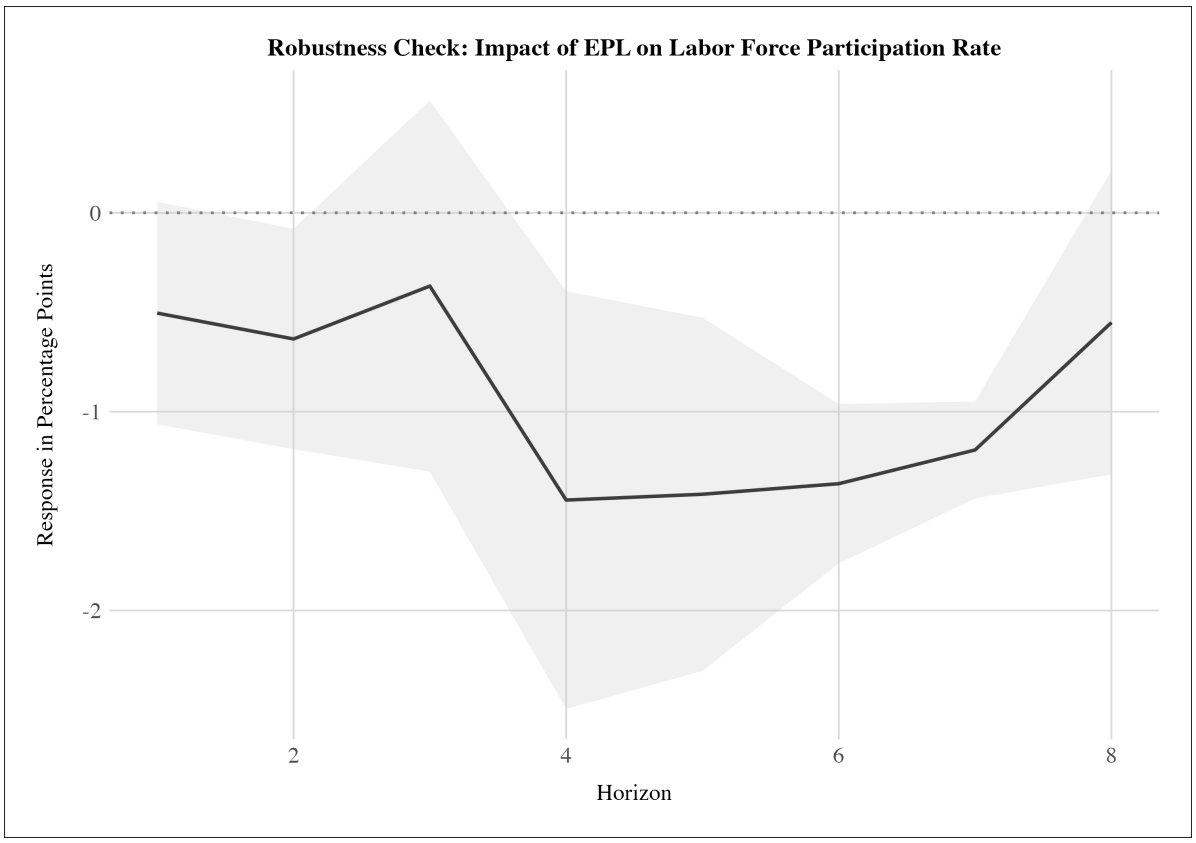

Figure 7: IRF of the LFPR to a Shock in EPL
Notes: The IRF shows the effect of a one-unit shock in the EPRC score on the Labor Force Participation Rate. The model includes controls for lags of the LFPR, population, mean years of schooling, and EPRC. The analysis uses Driscoll-Kraay standard errors, and the response is measured in percentage points over an 8-year horizon, with 90% confidence intervals.

EPL Duality (in absolute values) on the ER with control variables (lag 1 ER, lag 1 Population, lag 1 Mean Years of Schooling, lag 1 EPL Duality Abs. Values):

The shock variable, *EPL_Duality_Version1_2020_abs*, captures changes in the gap between employment protection for regular and temporary workers. It was calculated as the absolute difference between their EPL scores. By using the absolute values, we can ensure that the analysis focuses solely on the extent of labor market segmentation.

Table 11: LP Results: Estimates of EPL Duality Shock on the ER

H after shock	**Horizon 1**	**Horizon 2**	**Horizon 3**	**Horizon 4**	**Horizon 5**	**Horizon 6**	**Horizon 7**	**Horizon 8**
Estimates	0.5143	-0.0764	-0.1263	-0.4513	-0.8797	-1.1451	-2.9679***	-3.2416***
	(0.4182)	(0.7159)	(0.6910)	(0.6831)	(0.8438)	(0.9188)	(1.109)	(1.1879)
t value	1.2297	-0.1067	-0.1828	-0.6607	-1.0426	-1.2462	-2.6786	-2.7288
Pr(>|t|)	0.2198	0.9151	0.8551	0.5095	0.2984	0.2144	0.0083	0.0074
Country FE	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes

Notes: Driscoll-Kraay adjusted robust standard errors presented in parentheses. ∗∗∗, ∗∗ and ∗ denote 1, 5, and 10% significance levels, respectively.

Robustness Check ALMP: Dummy Based Shock on the ER with control variables (lag 1 ER, lag 2 ER, lag 1 Population, lag 1 Mean Years of Schooling, lag 1 ALMP):

The robustness check for the analysis of ALMP reforms utilizes a different approach: Dummy variables were created to capture significant reform events (see Chapter 3). Hence, extreme policy changes were identified based on the distribution of changes across countries and years.

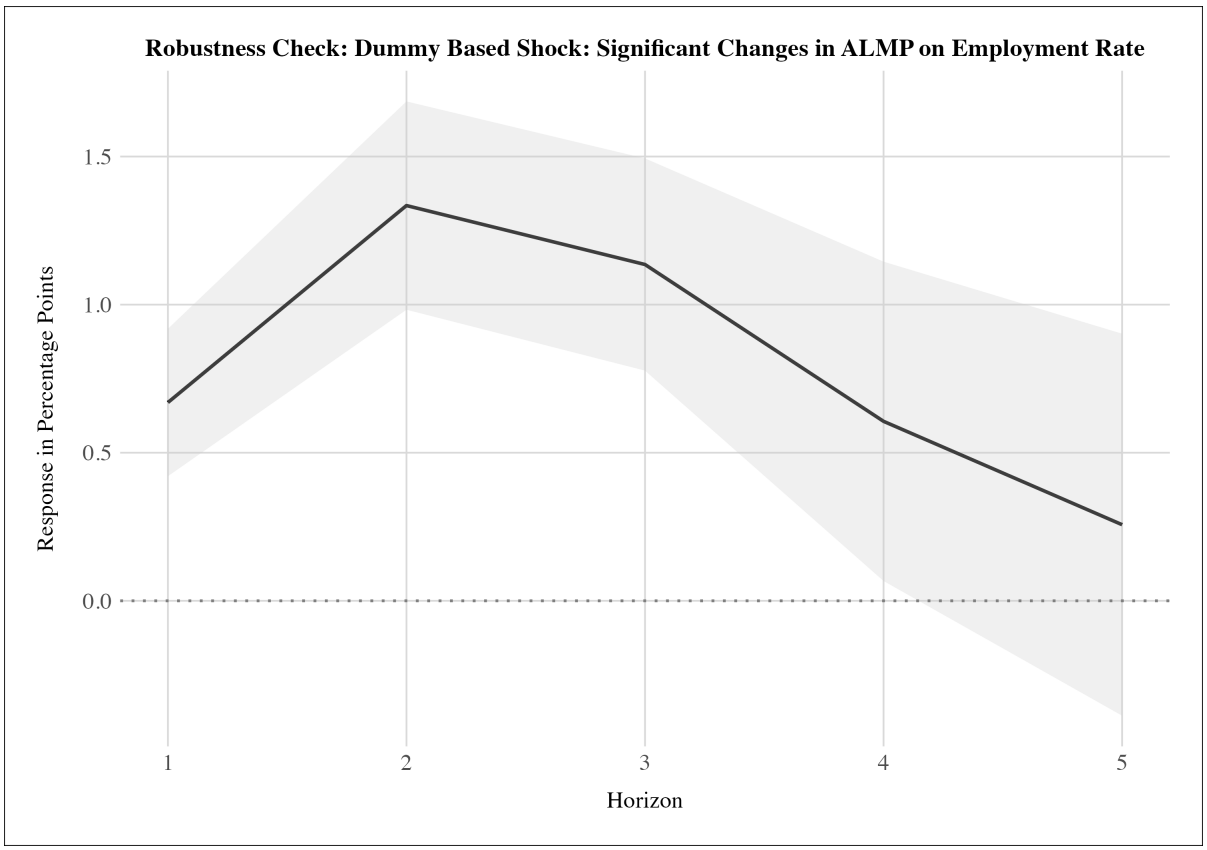

Figure 8: Robustness Check: IRF of the ER to Significant ALMP Changes
Notes: The figure depicts the IRF of the ER to significant changes in ALMP. The shock was defined using a dummy capturing positive (10th percentile) and negative (bottom 10th percentile) reforms. The model includes controls for lagged ER, population, mean years of schooling, and ALMP. Driscoll-Kraay standard errors were used to account for heteroskedasticity and cross-sectional dependence. Responses are measured in percentage points over a 5-year horizon with 90% confidence intervals.