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# From Revolution to Divergence: Structural Reforms and the Persistence of Portugal's Post-1974 Growth Gap\*

April, 2026

João Tovar Jalles<sup>#</sup>

## Abstract

This paper investigates the persistence of Portugal's post-1974 growth gap relative to a synthetic counterfactual, focusing on the role of structural reforms. Building on evidence of a structural break following the Carnation Revolution, the analysis shifts attention from the initial divergence to the mechanisms sustaining it over subsequent decades. A novel dataset of annual institutional reforms covering labour market regulation, unemployment benefits, collective bargaining, minimum wages, and product market regulation is constructed for the period 1970–2025. Using local projection methods, the paper estimates the dynamic effects of these reforms on the evolution of the gap and its underlying channels. The results reveal a clear asymmetry across institutional domains. Product-market liberalization is associated with a gradual narrowing of the gap, while labour-market rigidities are linked to its persistence, particularly at medium to longer horizons. These effects operate primarily through the investment channel, with limited contributions from employment and productivity dynamics. Moreover, the impact of reforms is state-dependent: external constraints significantly amplify both the adverse effects of rigidities and the benefits of liberalization. Robustness checks and placebo-based inference using OECD countries confirm the stability of the findings. Overall, the results highlight the importance of institutional design and macroeconomic context in shaping long-run growth and adjustment dynamics in small open economies.

**JEL codes:** E24, E32, O43, O52, P16

**Keywords:** Structural reforms; Growth gap; Labour market rigidity; Product market regulation; Portugal

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# 1. Introduction

Portugal experienced a marked and persistent slowdown in economic growth following the 1974 Carnation Revolution. While the political transition successfully established a democratic regime and expanded social and economic rights, its long-run economic consequences remain debated. In particular, the Portuguese economy diverged substantially from the trajectory of comparable advanced economies in the decades after 1974, raising the question of whether this divergence reflects a temporary disruption associated with political transition or more persistent structural forces.

A recent contribution by Amaral, Marques and Pereira dos Santos (2026) provides a comprehensive empirical assessment of this episode. Using the synthetic control method (Abadie and Gardeazabal, 2003; Abadie et al., 2010), the authors construct a counterfactual trajectory for Portugal based on comparable OECD economies and show that GDP per capita fell significantly below this benchmark after 1974. The gap emerges rapidly in the mid-1970s and remains large and persistent over subsequent decades. Amaral et al. (2026) attribute this divergence to a combination of mechanisms associated with the revolutionary period, including wage pressures, capital flight, nationalizations, and external imbalances, which together altered the capital–labour ratio and reduced investment intensity. Their analysis establishes convincingly that the Carnation Revolution represents a structural break in Portugal’s growth trajectory.

While this evidence is compelling, it leaves open a central question: why did the growth gap persist for so long after the initial shock? The Revolution itself can be interpreted as a discrete event, but the subsequent trajectory of the Portuguese economy was shaped by a sequence of institutional and policy changes. Understanding whether—and how—these changes influenced the persistence of the divergence is essential for interpreting Portugal’s long-run economic performance.

This paper addresses that question by focusing on the role of post-revolution institutional reforms in Portugal. Following 1974, the country underwent substantial transformations in labour market regulation, unemployment protection, collective bargaining systems, minimum wage policy, and product-market regulation. These reforms were part of a broader reconfiguration of the economic system and evolved over several decades, shaped both by domestic political dynamics and by external constraints, including balance-of-payments pressures and European integration. The central objective of this paper is to assess whether these institutional developments contributed to the persistence of the growth divergence identified by Amaral et al. (2026).

The contribution of this paper is threefold. First, it shifts the focus from identifying the initial break to explaining its persistence. While Amaral et al. (2026) document the

magnitude and timing of the divergence, this paper investigates the mechanisms that may have prolonged it, with particular emphasis on the role of labour market institutions and product-market regulation. Second, the paper constructs a novel dataset of annual institutional reforms for Portugal over the period 1970–2025. These data cover multiple dimensions of economic regulation and are consistently coded in terms of their impact on flexibility or rigidity, allowing the construction of cumulative indices that capture the evolution of the institutional environment over time. Third, the paper develops an empirical strategy that combines the synthetic-control-based growth gap with dynamic local projection methods (Jordà, 2005). By focusing on the deviation of Portugal’s GDP per capita from its synthetic counterfactual, the analysis isolates the country-specific component of growth performance and estimates how institutional reforms shape its evolution over time.

More broadly, the paper relates to several strands of the literature. A first strand examines the macroeconomic consequences of labour and product market institutions, highlighting their role in shaping employment dynamics, wage setting, and adjustment to shocks (Nickell, 1997; Blanchard and Wolfers, 2000; Bentolila and Bertola, 1990; Nicoletti and Scarpetta, 2003; Aghion et al., 2005). A second strand focuses on social protection systems and unemployment insurance, emphasizing both their insurance benefits and potential distortionary effects (Ljungqvist and Sargent, 1998; Chetty, 2008; Landais et al., 2018). A third strand underscores the importance of external constraints in small open economies, where balance-of-payments pressures can shape the effectiveness of domestic policies (Krugman and Macedo, 1981; Obstfeld and Rogoff, 1995; Blanchard and Giavazzi, 2002). Finally, the paper relates to the literature on political transitions and institutional change, which highlights how major political shocks can generate persistent economic effects through their impact on institutions (Acemoglu and Robinson, 2006; Acemoglu et al., 2011; Goldstone et al., 2022).

Within the Portuguese context, previous work has emphasized the roles of capital accumulation, investment dynamics, and structural transformation in explaining growth performance (Lains, 2003; Amaral, 2005; Reis, 2013). However, these contributions do not explicitly link long-run growth outcomes to a systematic measure of institutional change. This paper aims to fill that gap by integrating detailed institutional data into a unified empirical framework.

The central hypothesis is that institutional reforms influenced the persistence of Portugal’s post-1974 growth divergence, particularly through their effects on investment and adjustment dynamics, and that these effects depend on macroeconomic conditions, notably the presence of external constraints. The empirical results show that product-market liberalization is associated with a gradual narrowing of the growth gap, while increases in labour and wage rigidities are linked to its persistence and, at longer horizons, to a widening of the divergence. These effects are economically meaningful and robust

across specifications, operate primarily through the investment channel, and are significantly amplified during periods of external imbalance, highlighting the state-dependent nature of institutional reforms in a small open economy context.

While the analysis focuses on Portugal, the findings speak more broadly to small open economies undergoing structural change, where the interaction between institutions and external constraints can shape long-run growth dynamics.

The remainder of the paper is structured as follows. Section 2 presents the empirical methodology, including the construction of the synthetic control and the dynamic framework used to estimate the effects of reforms. Section 3 describes the data and the construction of the reform indices. Section 4 presents stylized facts on Portugal’s growth divergence and institutional trajectory. Section 5 reports the main empirical results, including baseline estimates, transmission channels, and robustness checks. Section 6 concludes and discusses policy implications.

## 2. Empirical Methodology

The empirical strategy builds directly on Amaral et al. (2026) by taking the synthetic-control-based counterfactual for Portugal as the starting point and shifting the focus to the dynamic evolution of the post-1974 gap. The objective is not to re-identify the structural break, but to explain its persistence as a function of institutional developments.

### 2.1 Outcome variable and baseline framework

The central outcome variable is the deviation of Portugal’s real GDP per capita from its synthetic counterfactual, constructed following the methodology of Abadie and Gardeazabal (2003) and Abadie et al. (2010):

$$Gap_t = \log y_{PT,t} - \log y_{PT,t}^{SCM}$$

In this expression,  $y_{PT,t}$  denotes real GDP per capita in Portugal at time  $t$ , measured in constant prices and expressed in purchasing power parity (PPP)-adjusted terms, while  $y_{PT,t}^{SCM}$  denotes the synthetic counterfactual level obtained as a convex combination of donor countries selected to replicate Portugal’s pre-1974 characteristics and trajectory. The use of the natural logarithm implies that  $Gap_t$  can be interpreted approximately as a percentage deviation from the counterfactual path, such that negative values correspond to underperformance relative to the synthetic benchmark.

This transformation removes common global shocks, long-run convergence forces, and structural trends affecting comparable economies, thereby isolating the component of growth performance that is specific to Portugal. By construction, the synthetic control matches Portugal closely in the pre-treatment period, implying that the gap is approximately

zero prior to 1974. Following the Carnation Revolution, however, the gap becomes negative and remains persistently below zero, as documented by Amaral et al. (2026). The empirical objective of this paper is to explain the time-series evolution of this gap in the post-1974 period.

A natural starting point for the analysis is a dynamic time-series specification of the form:

$$Gap_t = \alpha + \rho Gap_t + \beta' Reform_t + \Gamma' X_{t-1} + \varepsilon_t$$

where  $\alpha$  is a constant term,  $\rho$  is an autoregressive parameter capturing persistence in the growth gap,  $Reform_t$  is a vector of institutional reform indices,  $X_{t-1}$  is a vector of lagged macroeconomic and fiscal controls, and  $\varepsilon_t$  is an error term assumed to have zero conditional mean given the information set at time  $t$ .

The vector  $Reform_t$  comprises cumulative indices of institutional change across several policy dimensions, including employment protection legislation, unemployment benefits, product-market regulation, collective bargaining arrangements, and minimum wages. Each index captures the accumulated effect of past reforms relative to a pre-1974 baseline, with positive values indicating a more liberal or flexible institutional environment under the adopted coding. The associated coefficient vector  $\beta$  measures the marginal effect of changes in each institutional dimension on the growth gap, conditional on past dynamics and macroeconomic conditions.

The vector  $X_{t-1}$  includes lagged controls designed to capture macroeconomic conditions that may influence both the evolution of the gap and the timing of reforms. These controls typically include variables such as the investment-to-GDP ratio, fiscal balances, inflation, and external conditions. The corresponding coefficient vector  $\Gamma$  captures the contribution of these factors to the dynamics of the gap. The inclusion of lagged controls is intended to mitigate concerns about omitted-variable bias and to approximate a conditional exogeneity assumption for the reform variables.

The autoregressive coefficient  $\rho$  captures the persistence of deviations from the counterfactual trajectory. Values of  $\rho$  close to unity imply that shocks to the gap dissipate slowly, reflecting frictions in capital accumulation, labour reallocation, and institutional adjustment. This is consistent with the empirical evidence for Portugal, where the divergence from the synthetic counterfactual appears highly persistent over time. At the same time, the inclusion of the lagged dependent variable implies that the coefficients in  $\beta$  should be interpreted as partial effects on the level of the gap, controlling for its past evolution.

While this baseline specification provides a useful benchmark, it imposes a restrictive dynamic structure by summarizing adjustment processes through a single autoregressive parameter. In particular, it does not allow for horizon-specific responses or for the possibility

that the effects of reforms unfold gradually over time. Moreover, the contemporaneous inclusion of the reform indices may conflate short-run and medium-run effects, making it difficult to disentangle immediate impacts from delayed responses. For these reasons, the analysis is extended in the following section using a local projection framework, which provides a more flexible characterization of the dynamic relationship between institutional reforms and the growth gap.

## 2.2 Dynamic Specification: Local Projections

To overcome the limitations of the baseline autoregressive specification and to allow for a flexible characterization of adjustment dynamics, the analysis relies on the local projection methodology proposed by Jordà (2005). This approach estimates the response of the growth gap at different horizons directly, without imposing a specific parametric structure on the underlying data-generating process.

The empirical specification takes the form:

$$Gap_{t+h} - Gap_t = \alpha_h + \beta_h' Reform_t + \Gamma_h' X_{t-1} + \varepsilon_{t+h}$$

for horizons  $h = 0, \dots, H$ , where  $H$  is set to capture short- to medium-run dynamics. In this formulation, the dependent variable represents the cumulative change in the growth gap between periods  $t$  and  $t + h$ , which can be interpreted as the response of the gap to a reform occurring at time  $t$ . The coefficient vector  $\beta_h$  therefore traces the dynamic effect of institutional changes across horizons, allowing the construction of impulse response functions.

The parameters  $\alpha_h$  capture horizon-specific intercepts, while  $\Gamma_h$  allows the effect of macroeconomic controls to vary with the horizon. The error term  $\varepsilon_{t+h}$  is assumed to satisfy a conditional mean-zero restriction given the information set at time  $t$ , although serial correlation is expected due to overlapping forecast horizons.

This approach offers several advantages in the present context. First, it accommodates the possibility that the effects of institutional reforms are delayed and unfold gradually, which is particularly relevant in environments characterized by adjustment costs and capital accumulation dynamics. Second, it is robust to misspecification of the underlying dynamic structure, an important consideration given the presence of structural breaks and evolving institutions. Third, it allows for the direct testing of horizon-specific hypotheses, such as whether reforms have transitory or persistent effects on the growth gap.

The coefficients  $\beta_h$  can be interpreted as semi-elasticities, measuring the change in the cumulative growth gap associated with a one-unit increase in the reform index at time  $t$ . Given the normalization of the indices, this corresponds to a marginal change in the institutional environment relative to the pre-1974 baseline. A positive value of  $\beta_h$  implies that

a liberalizing reform is associated with a narrowing of the gap at horizon  $h$ , while a negative value indicates a widening of the divergence.

## 2.3 External Constraints and State Dependence

A key mechanism underlying the empirical analysis is the interaction between institutional reforms and macroeconomic conditions, particularly external constraints. In small open economies, the availability of external financing and the sustainability of the current account position can significantly influence the adjustment process and the effectiveness of policy interventions (Krugman and Macedo, 1981; Obstfeld and Rogoff, 1995).

To capture this dimension, the baseline local projection specification is augmented with an interaction term:

$$Gap_{t+h} - Gap_t = \alpha_h + \beta'_h Reform_t + \phi'_h (Reform_t \times CA_{t-1}) + \Gamma'_h X_{t-1} + \varepsilon_{t+h}$$

where  $CA_{t-1}$  denotes the lagged current account balance as a share of GDP. The interaction term allows the marginal effect of reforms to depend on the external position of the economy. The coefficient vector  $\phi_h$  captures this state dependence, with its sign indicating whether the impact of reforms is amplified or dampened under conditions of external imbalance.

In particular, if external deficits constrain investment and limit access to capital, reforms that increase adjustment costs may have more pronounced negative effects on growth. Conversely, reforms that enhance flexibility may facilitate adjustment and mitigate the impact of external constraints. This specification therefore provides a direct empirical test of whether institutional effects are contingent on macroeconomic conditions.

## 2.4 Channels and Mechanisms

To further elucidate the mechanisms through which institutional reforms affect growth outcomes, the analysis extends the local projection framework to a set of intermediate variables. Specifically, the same specification is estimated using dependent variables defined as deviations from synthetic counterfactuals for investment, employment, and total factor productivity.

Formally, for each variable  $M_t$ , a corresponding gap is constructed:

$$MGap_t = \log M_{PT,t} - \log M_{PT,t}^{SCM}$$

and the following specification is estimated:

$$MGap_{t+h} - MGap_t = \alpha_h + \beta'_h Reform_t + \Gamma'_h X_{t-1} + \varepsilon_{t+h}$$

This approach allows the identification of the primary transmission channels through which institutional changes influence the overall growth gap. In line with the findings of Amaral et al. (2026), particular attention is devoted to the role of investment, given its central importance in capital accumulation and long-run growth (Solow, 1956). At the same time, labour market adjustments and productivity dynamics are also examined, reflecting the multidimensional nature of institutional effects.

## 2.5 Identification, Inference, and Validation

The identification strategy rests on the assumption that, conditional on lagged controls, the timing of institutional reforms is not systematically driven by unobserved future innovations in the growth gap. While this conditional exogeneity assumption cannot be tested directly, its plausibility is assessed through several complementary approaches.

A first step consists in testing for the absence of pre-trends by including leads of the reform variables in the local projection specification. Insignificant coefficients on these leads provide evidence that reforms do not anticipate future movements in the gap, supporting a causal interpretation of the baseline estimates.

A second concern relates to serial correlation and heteroskedasticity in the error terms, particularly given the overlapping structure of the dependent variable in local projections. To address this issue, inference is based on heteroskedasticity and autocorrelation consistent standard errors, following Newey and West (1987), with lag lengths chosen to account for the horizon of the projections.

A remaining concern is that institutional reforms may be endogenous to expected economic conditions, particularly if policymakers implement reforms in response to anticipated future downturns or structural weaknesses. Several features of the empirical strategy mitigate this concern. First, the reform measures are constructed using a narrative approach that identifies discrete policy changes based on legislative actions rather than contemporaneous economic outcomes, reducing the likelihood that they mechanically reflect cyclical conditions. Second, the inclusion of lagged macroeconomic controls—such as the growth gap, investment, and external balances—captures the economic environment in which reforms are implemented and absorbs predictable components of reform timing. Third, the local projection framework explicitly tests for pre-trends, and the absence of systematic effects of reform leads provides evidence against anticipatory behavior. Finally, the placebo-based inference across OECD countries shows that the estimated effects for Portugal are unusually large relative to comparable economies, suggesting that the results are unlikely to be driven by spurious correlations or common shocks. Taken together, these elements support a conditional causal interpretation of the estimated relationships, although the results should be understood as identifying dynamic associations under plausible but not fully testable exogeneity assumptions.

Given the relatively small sample size inherent in a single-country time series, additional validation is obtained through a placebo-based approach using OECD countries. For each country in the donor pool, a synthetic counterfactual is constructed and the same gap–reform relationship is estimated. Portugal’s estimated coefficients are then compared to the distribution of placebo estimates, providing a non-parametric benchmark for statistical significance consistent with the inference procedures in the synthetic control literature (Abadie et al., 2010).

Finally, the empirical strategy deliberately prioritizes a time-series approach focused on Portugal rather than a pooled cross-country panel. While panel methods offer greater statistical power, they require strong homogeneity assumptions regarding the effects of reforms across countries with different institutional and macroeconomic contexts. By contrast, the present approach preserves the internal coherence of the Portuguese case while using cross-country evidence as a validation device rather than as the primary source of identification.

## 3. Data and Reform Indices

### 3.1 Reform data

The empirical analysis relies on a newly constructed annual dataset of institutional reforms for Portugal covering the period 1970–2025. The dataset spans five key policy domains: employment protection legislation (EPL), unemployment benefits (UB), product market regulation (PMR), collective bargaining institutions (CB), and minimum wage policy (MW). These areas capture the main institutional margins through which labour market rigidity, wage setting, and market competition may influence macroeconomic performance.

The construction of the reform indicators follows a narrative approach grounded in documented legislative and regulatory changes. In particular, the dataset builds on the methodology introduced by Duval et al. (2018), which identifies major structural reform episodes in advanced economies based on OECD Economic Surveys and country-specific institutional sources. This framework has recently been extended and updated to 2025 by Wiese, de Haan and Jalles (2026), providing a comprehensive and internally consistent classification of reform and counter-reform events across OECD countries. The present paper adopts this approach and extends it to additional institutional domains relevant for the Portuguese case, including collective bargaining and minimum wage regulation.

A key feature of this narrative methodology is its focus on discrete, economically meaningful policy changes, rather than gradual or administrative adjustments. Each reform episode corresponds to a legislative or regulatory intervention that is expected to affect firms’ hiring, firing, wage-setting, or investment decisions. Importantly, the dataset also records counter-reforms, defined as policy changes that move institutions in the opposite

direction of prior reforms, thereby allowing for non-monotonic and reversible institutional dynamics.

Each reform is coded using a trichotomous indicator:

$$shock_t^k \in \{-1,0,1\}$$

where  $k$  indexes the policy domain. A value of  $+1$  denotes a liberalizing or flexibility-enhancing reform, a value of  $-1$  denotes a restrictive or rigidity-increasing reform, and  $0$  indicates the absence of a major reform in that year. This directional coding is deliberately framed in economic rather than ideological terms, ensuring that the classification reflects the expected impact on market functioning rather than normative judgments.

This narrative approach offers several advantages. First, it provides a transparent mapping between observed policy changes and the underlying institutional environment. Second, it captures policy reversals and reform clustering, which are particularly relevant in the Portuguese context following the 1974 revolution. Third, it avoids measurement error associated with continuous institutional indices that may reflect gradual adjustments or changes in enforcement rather than discrete policy shifts. At the same time, it implies that reforms are heterogeneous in magnitude and scope, a feature that motivates the use of flexible empirical methods in the subsequent analysis.

### 3.2 Construction of reform indices

To capture the cumulative and persistent nature of institutional change, the analysis aggregates yearly reform shocks into stock-type indices. For each policy domain  $k$ , the baseline index is constructed as:

$$Index_t^k = \sum_{\tau \leq t} shock_\tau^k$$

This cumulative formulation reflects the idea that institutional reforms are not transitory shocks but rather changes in the regulatory environment that remain in place unless explicitly reversed. As emphasized by Wiese, de Haan and Jalles (2026), ignoring this persistence can lead to biased estimates in empirical models, particularly when reforms are treated as one-off shocks despite their lasting effects.

To ensure comparability and interpretability, the indices are normalized relative to the pre-revolution benchmark:

$$Index_t^{k,norm} = Index_t^k - Index_{1973}^k$$

This normalization sets the institutional configuration prevailing immediately before the 1974 break as the reference point, such that all subsequent movements reflect deviations

from the pre-revolution regime. As a result, positive values indicate net liberalization relative to 1973, while negative values indicate an increase in institutional rigidity.

In addition to the individual indices, two composite measures are constructed to summarize broader institutional dynamics. The first is a labour market index, defined as the average of EPL, UB, CB, and MW indices, capturing the overall degree of labour and wage-setting rigidity. The second is a product market index, based on PMR reforms, reflecting the evolution of competition and regulatory barriers in goods and services markets. These composite measures facilitate the distinction between labour and product market channels, which is central to the empirical analysis.

This index-based approach is consistent with the view that institutional configurations evolve gradually through sequences of reforms and counter-reforms, and that their macroeconomic effects depend on the accumulated regulatory environment rather than isolated policy changes. At the same time, the use of cumulative indices preserves the timing information embedded in the underlying narrative data, allowing the identification of dynamic responses in the empirical framework.

### 3.3 Macroeconomic and comparator data

The reform dataset is combined with a comprehensive set of macroeconomic and fiscal variables. Real GDP per capita is used to construct the main outcome variable—the Portugal–synthetic Portugal growth gap—using data from standard international sources such as the Penn World Tables and Maddison Project Database. Additional variables include investment as a share of GDP, employment and unemployment indicators, current account balances, inflation, and fiscal aggregates such as government expenditure, deficits, and public debt.

These variables serve two main purposes. First, they allow the construction of gap measures for key transmission channels, including investment, employment, and productivity. Second, they provide a set of lagged controls in the empirical specifications, helping to account for macroeconomic conditions that may influence both reform timing and economic outcomes.

Finally, data for a set of OECD countries are used to construct the synthetic control counterfactual and to implement placebo-based inference exercises. The donor pool excludes countries with structural similarities that may violate the identifying assumptions in baseline specifications, with alternative pools considered as part of the robustness analysis. Importantly, while cross-country data play a role in constructing the counterfactual and validating the results, the empirical analysis remains fundamentally focused on the Portuguese experience.

## 4. Stylized Facts

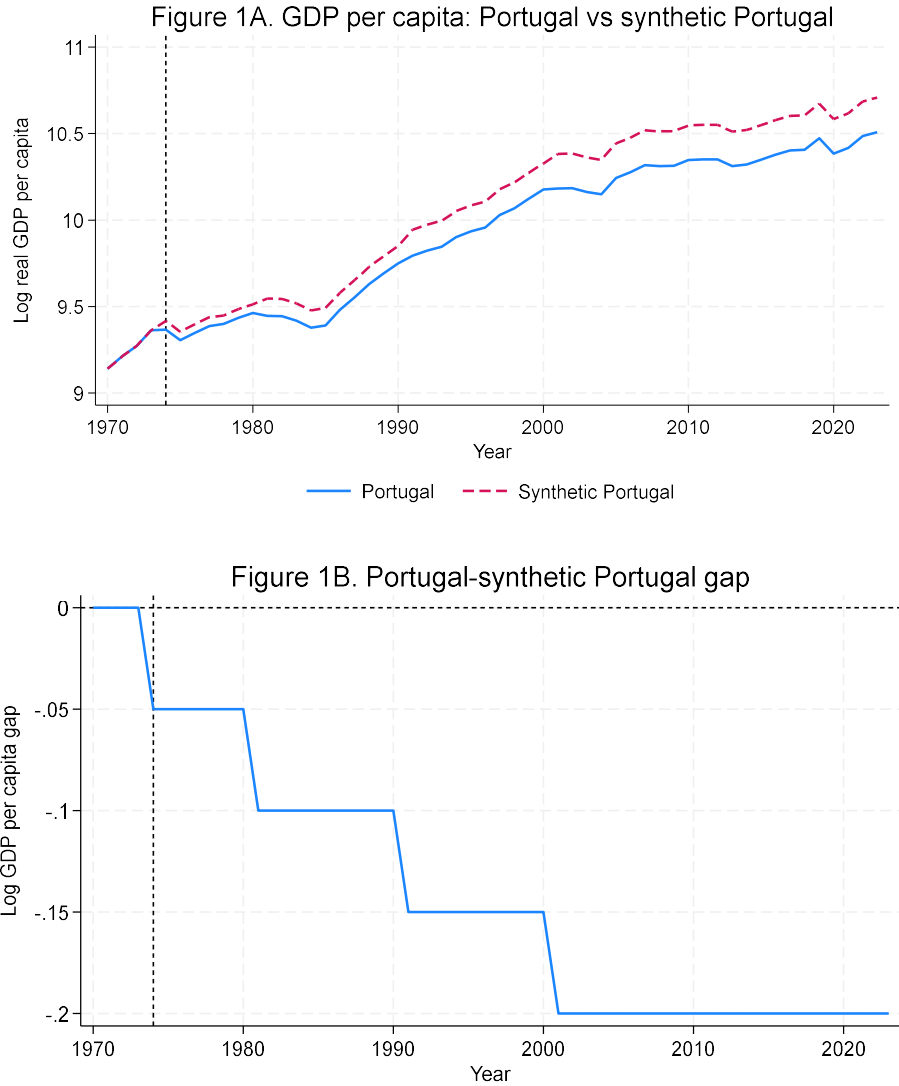
This section documents the core empirical regularities that motivate the econometric analysis. The objective is not to establish causality at this stage, but to show, in a transparent way, that Portugal's post-1974 growth trajectory differs persistently from a plausible counterfactual and that this divergence coincides with important institutional, investment, and external-balance dynamics.

The starting point is the structural break in Portugal's growth path following the Carnation Revolution. Figure 1A plots log real GDP per capita for Portugal and synthetic Portugal. The two series track each other closely before 1974, supporting the credibility of the synthetic benchmark. After the break, Portugal grows more slowly than its synthetic counterpart, and the distance between the two series widens gradually over time.

Figure 1B reports the corresponding gap, defined as the difference between log real GDP per capita in Portugal and log real GDP per capita in synthetic Portugal. The gap is close to zero before 1974, becomes negative immediately after the break, and remains persistently below zero thereafter. By the later part of the sample, the gap reaches roughly 20 log points, indicating a large and durable shortfall relative to the counterfactual path.

This evidence confirms the central empirical premise of the paper: Portugal experienced not only a discrete post-1974 break, but also a persistent divergence from its synthetic counterfactual. The remainder of the analysis therefore focuses on the persistence of this gap rather than on the initial break itself. In particular, the next figures relate the post-1974 divergence to Portugal's institutional trajectory, investment dynamics, and external constraints.

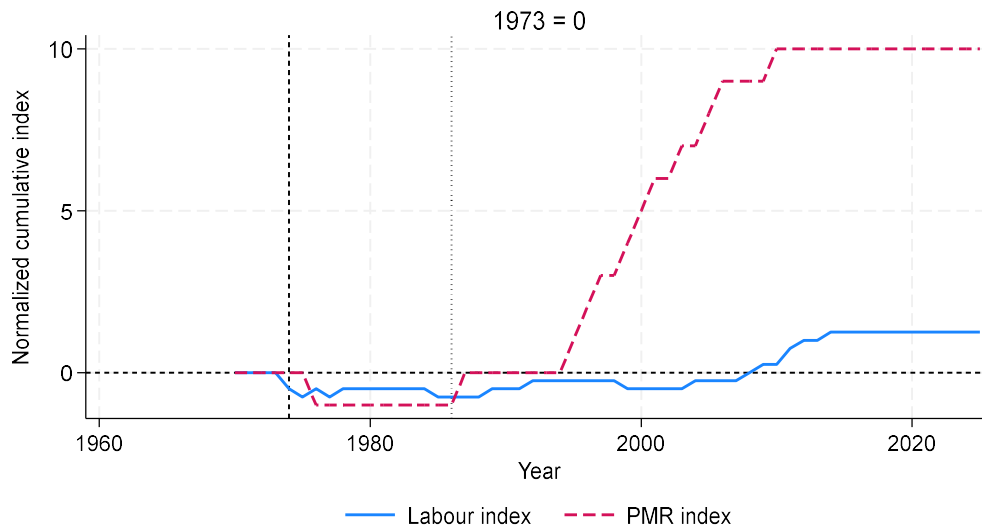
**Figure 1. GDP per capita and synthetic counterfactual (Portugal)**



Note: Panel A plots log real GDP per capita for Portugal and its synthetic control. Panel B reports the corresponding gap, defined as the difference between log real GDP per capita in Portugal and in synthetic Portugal. The vertical dashed line marks 1974 (Carnation Revolution). The synthetic series is constructed using the method of Abadie et al. (2010) to match Portugal’s pre-1974 characteristics. A negative gap indicates underperformance relative to the counterfactual.

The post-1974 period is characterized by substantial changes in Portugal’s institutional framework. Using the cumulative reform indices constructed in Section 3, Figure 2 summarizes the evolution of labour market institutions and product market regulation (PMR) relative to their pre-revolution benchmark (1973 = 0).

**Figure 2 — Institutional indices (Portugal)**



Note: The figure plots cumulative institutional reform indices for Portugal, normalized such that 1973 = 0. The labour index is constructed as the average of employment protection legislation (EPL), unemployment benefits (UB), collective bargaining (CB), and minimum wage (MW) indices, while the PMR index captures product market regulation reforms. Each index accumulates discrete reform and counter-reform episodes coded as +1 (liberalizing), -1 (restrictive), and 0 (no reform). The vertical dashed line marks 1974 (Carnation Revolution), and the dotted line marks 1986 (EU accession). Positive values indicate a more liberal institutional environment relative to the pre-1974 baseline.

Two main features emerge. First, labour market institutions exhibit an initial shift towards greater rigidity in the immediate aftermath of the 1974 revolution, as reflected in the decline of the labour index below its pre-revolution level. However, this pattern is gradually reversed from the late 1980s onward, with a progressive liberalization that becomes more pronounced in the 2000s and stabilizes slightly above the 1973 benchmark in recent years. Second, product market reforms display a markedly different dynamic. The PMR index remains broadly flat or slightly negative until the early 1990s, after which it increases sharply and persistently, indicating a sustained wave of liberalizing reforms. This acceleration coincides closely with European integration and subsequent regulatory harmonization, leading to a substantial and cumulative shift toward more competitive product markets.

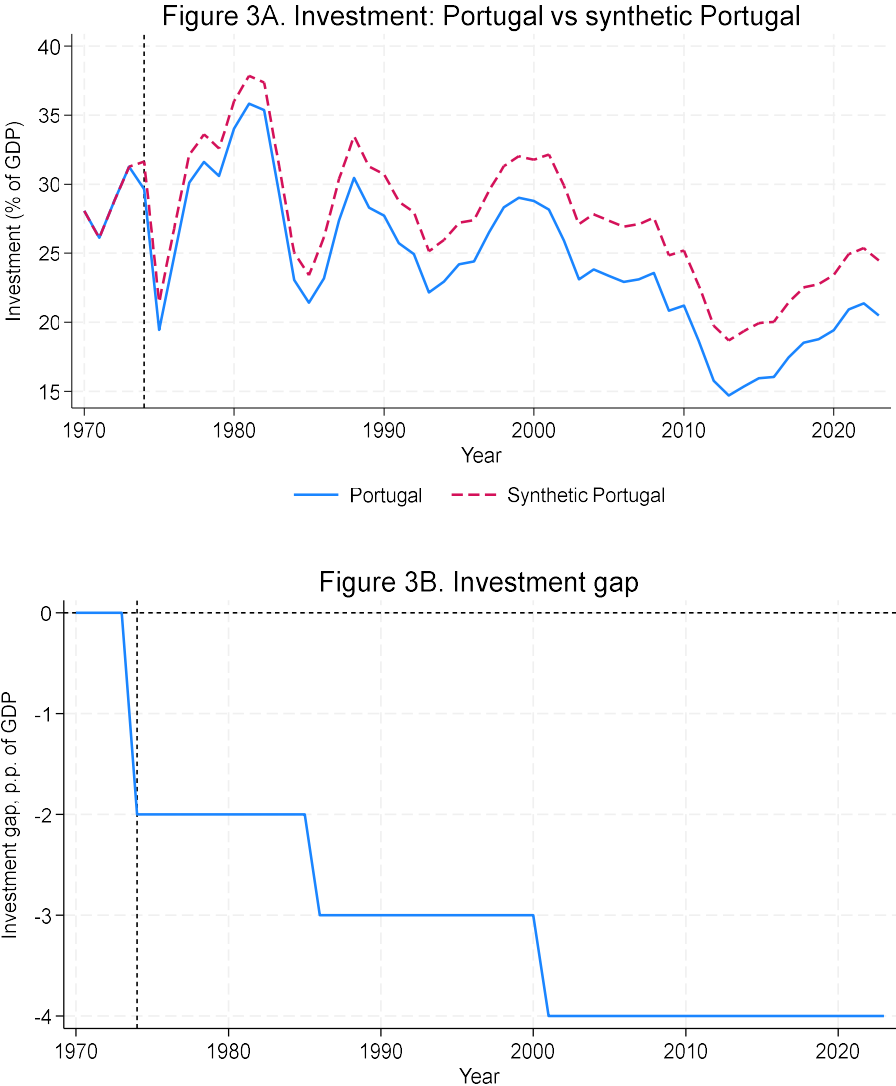
This divergence is further illustrated in Figure A1, which decomposes the labour index into its main components. The decomposition highlights considerable heterogeneity across policy domains. Employment protection legislation (EPL) and collective bargaining arrangements show a clear trend toward liberalization over time, particularly from the 1990s onward. By contrast, minimum wage policies become more restrictive and remain persistently below the pre-1974 benchmark, while unemployment benefits display a more mixed and non-monotonic pattern.

Taken together, these figures point to an important asymmetry in institutional adjustment. While labour market institutions underwent an initial tightening followed by

gradual and partial liberalization, product market reforms were delayed but ultimately much stronger and more sustained. Moreover, the heterogeneity within labour market policies suggests that different institutional margins may have exerted distinct—and potentially offsetting—effects on economic performance.

A key mechanism emphasized in the literature is the behavior of investment following the 1974 structural break. Figure 3 compares Portugal’s investment rate with that of its synthetic counterpart and reports the corresponding investment gap.

**Figure 3 — Investment dynamics (Portugal vs synthetic)**



Note: Panel A plots the investment rate (gross capital formation as a percentage of GDP) for Portugal and its synthetic counterpart. Panel B reports the corresponding investment gap, defined as the difference between Portugal’s investment rate and that of synthetic Portugal. The vertical dashed line marks 1974 (Carnation Revolution). The synthetic series is constructed using the synthetic control method to match Portugal’s pre-1974 characteristics. A negative gap indicates lower investment in Portugal relative to the counterfactual.

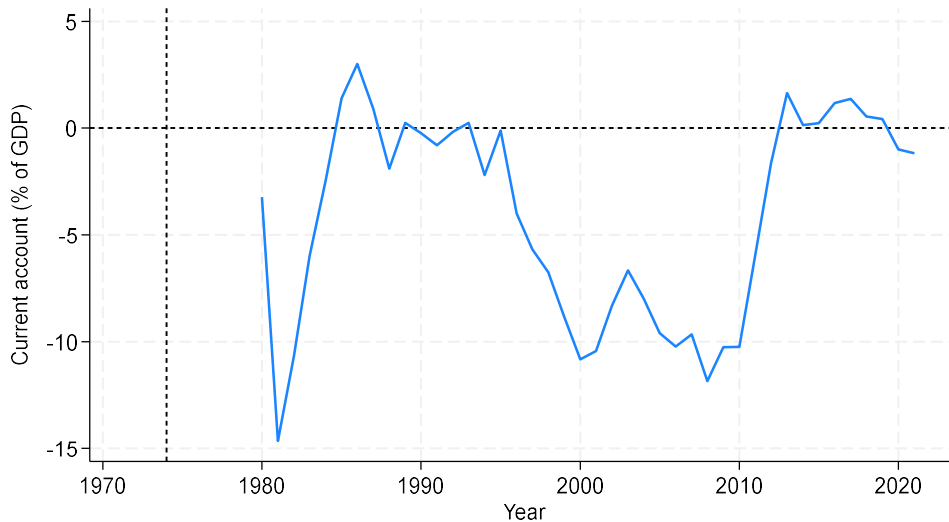
Two main findings emerge. First, while Portugal's investment rate closely tracks that of synthetic Portugal prior to 1974, a clear divergence appears immediately after the break. Investment in Portugal declines more sharply in the mid-1970s and remains systematically below the synthetic benchmark thereafter. Although there are episodes of partial recovery—particularly in the late 1980s and late 1990s—these are not sufficient to close the gap. Second, Panel B shows that the investment gap turns negative after 1974 and persists throughout the entire post-revolution period, widening further from the late 1990s onward. By the 2000s and 2010s, the shortfall becomes both larger and more stable, indicating a sustained underinvestment relative to the counterfactual trajectory. Overall, the evidence points to a persistent investment deficit rather than a purely transitory adjustment. This sustained weakness in capital accumulation is consistent with the hypothesis that changes in the institutional environment—particularly those affecting firms' incentives, adjustment costs, and expectations—may have played a central role in shaping long-run growth dynamics. This channel is examined formally in the empirical section.

Finally, the Portuguese economy experienced substantial external imbalances in the post-revolution period. Figure 4 presents the evolution of the current account balance as a share of GDP. Several features stand out. First, the post-1974 period is characterized by significant volatility in the external position, with large deficits emerging in the late 1970s and early 1980s. These are followed by episodes of temporary improvement, including brief surpluses in the late 1980s and early 1990s. Second, from the mid-1990s to the late 2000s, the current account deteriorates markedly, reaching sustained and sizeable deficits—often exceeding 10 percent of GDP—indicative of strong external imbalances during this period. Third, a sharp adjustment occurs after the sovereign debt crisis, with the current account moving into surplus in the early 2010s. This improvement, however, appears partly cyclical and is followed by a gradual normalization toward balance or mild deficits in recent years.

Overall, the evidence points to recurrent external imbalances rather than a smooth adjustment path, consistent with the presence of binding external constraints. Periods of large deficits likely reflect phases of externally financed demand and investment, while subsequent corrections coincide with tighter financing conditions and macroeconomic adjustment.

Additional insight into the interaction between reforms and growth dynamics is provided in Figure A2, which overlays reform episodes on the evolution of the growth gap. The figure shows that both labour/welfare and product market reforms are distributed across the post-1974 period, with some clustering in specific decades. While no simple one-to-one mapping between reforms and movements in the gap emerges at the descriptive level, the persistence of the negative gap alongside repeated reform episodes underscores the need for a formal dynamic analysis that accounts for timing, interactions, and delayed effects.

**Figure 4 — Current account balance (Portugal)**



Note: The figure plots the current account balance as a percentage of GDP for Portugal. The vertical dashed line marks 1974 (Carnation Revolution), and the horizontal line denotes balance (zero). Negative values indicate deficits and positive values indicate surpluses.

Taken together, these stylized facts establish three key elements that guide the empirical analysis. First, Portugal experienced a large and persistent growth gap relative to a credible counterfactual. Second, this period coincides with substantial and heterogeneous institutional changes across labour and product markets. Third, the joint evolution of investment and external balances points to economically meaningful transmission channels. The next section formally examines whether and to what extent institutional reforms help explain the persistence of the Portuguese growth gap.

Additional evidence supporting these patterns is reported in Appendix Tables A1 and A2. Table A1 documents the chronology of reform episodes, highlighting the clustering of labour and welfare policy changes in the immediate post-1974 period and the more gradual implementation of product market reforms in subsequent decades. This temporal sequencing reinforces the asymmetry observed in Figure 2, whereby labour market rigidities increased earlier and more sharply than product market liberalization. Table A2 provides a complementary statistical perspective by comparing key macroeconomic and institutional variables before and after 1974. The results confirm a marked shift in Portugal's economic environment, characterized by lower average growth performance, weaker investment, and a deterioration in external balances in the post-revolution period. At the same time, institutional indices exhibit substantial changes in both level and dispersion, consistent with the presence of significant policy reorientation and adjustment over time. Together, these appendix tables corroborate the graphical evidence and further motivate the empirical analysis that follows, which seeks to quantify the contribution of institutional reforms to the persistence of the Portuguese growth gap.

## 5. Empirical Results

This section presents the main empirical findings on the relationship between institutional reforms and the evolution of Portugal's growth gap relative to its synthetic counterfactual. The analysis proceeds in four steps. It first documents baseline results linking reforms to the persistence of the gap, then examines the underlying transmission channels, explores the role of external constraints, and finally assesses the robustness of the findings.

To ensure consistency in interpretation, a negative coefficient is understood to indicate a narrowing of the growth gap (i.e., convergence toward the synthetic benchmark), while a positive coefficient implies divergence; for channel variables such as investment, employment, and productivity gaps, a negative coefficient indicates a deterioration in relative performance vis-à-vis the counterfactual.

### 5.1 Baseline results

The baseline estimates provide mixed but informative evidence on the association between institutional reforms and the evolution of Portugal's growth gap. Table 3 reports local projection estimates where the dependent variable is the cumulative change in the Portugal–synthetic Portugal log GDP per capita gap between year  $t$  and horizon  $t + h$ . All specifications include the lagged gap, lagged investment-to-GDP ratio, and lagged current account balance, thereby controlling for persistence, capital accumulation dynamics, and external constraints.

The results for product market reforms are broadly consistent with the theoretical and empirical literature emphasizing the growth-enhancing role of market liberalization. The PMR coefficients are negative across all horizons, indicating that reductions in regulatory barriers and increased competition are associated with a narrowing of the gap between Portugal and its synthetic counterfactual. This pattern is in line with endogenous growth and firm-dynamics models (Aghion and Howitt, 1992; Blundell et al., 1999), where pro-competitive reforms foster innovation, entry, and resource reallocation. It also accords with cross-country evidence showing that lower product market regulation is associated with higher productivity growth (Nicoletti and Scarpetta, 2003). However, in the present setting, the estimated effects are quantitatively small and not statistically significant, suggesting that either the intensity of reforms was limited or that their impact was attenuated by other structural rigidities.

Labour-market institutions display a markedly different pattern. The aggregate labour index becomes positive and statistically significant at longer horizons, indicating that increases in labour market rigidities are associated with a widening of the growth gap over time. This finding is consistent with insider–outsider and search-and-matching frameworks

(Lindbeck and Snower, 1988; Pissarides, 2000), which emphasize how rigid wage-setting mechanisms and employment protection can reduce job creation, slow reallocation, and dampen productivity growth. In the Portuguese case, such rigidities may have been particularly binding in the presence of macroeconomic volatility and external financing constraints.

The disaggregated evidence further refines this interpretation. Unemployment benefit reforms are positively and statistically significantly associated with changes in the gap from horizon 1 onward, with effects increasing over time. While this may appear counterintuitive from a purely supply-side perspective, it is consistent with the notion that more generous benefits can support aggregate demand and consumption smoothing in the short to medium run (Blanchard and Katz, 1992). At the same time, these policies may weaken job-search incentives, leading to ambiguous net effects. By contrast, EPL coefficients are negative but imprecisely estimated, suggesting that while employment protection may reduce labour market flexibility, its independent effect is difficult to isolate in a single-country time-series context with limited degrees of freedom.

Taken together, the baseline results highlight the heterogeneous role of institutional reforms. Product market liberalization is associated with modest convergence forces, whereas labour-market institutions—particularly those increasing rigidity—are more closely linked to persistent divergence. This is consistent with the broader view that the interaction between product and labour market institutions is central for growth performance (Koeniger et al., 2007), and suggests that asymmetric reform dynamics across these domains may have contributed to the sustained gap between Portugal and its counterfactual benchmark.

**Table 3 — Baseline results: reforms and the growth gap**

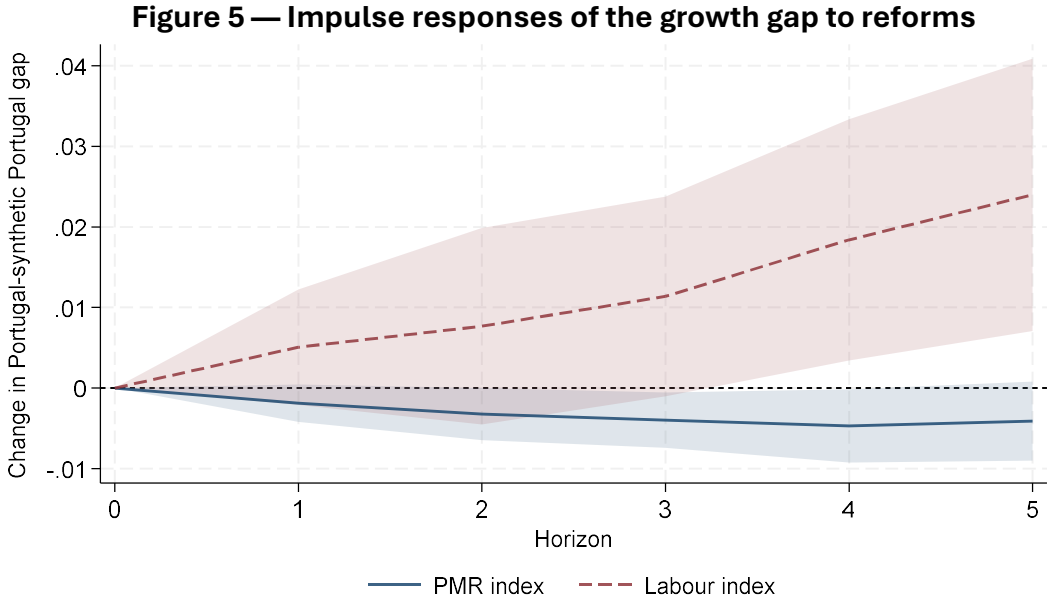
(Dependent variable:  $Gap_{t+h} - Gap_t$ . Newey–West standard errors in parentheses)

Horizon	EPL	UB	PMR	Labour index	Aggregate index
1	-0.004 (0.003)	0.005* (0.003)	-0.001 (0.001)	0.001 (0.002)	-0.001 (0.001)
2	-0.009 (0.006)	0.010* (0.005)	-0.002 (0.001)	-0.000 (0.005)	-0.003 (0.003)
3	-0.010 (0.007)	0.012** (0.005)	-0.002 (0.002)	0.002 (0.007)	-0.003 (0.003)
4	-0.008 (0.008)	0.016*** (0.005)	-0.002 (0.002)	0.008 (0.007)	-0.002 (0.004)
5	-0.002 (0.009)	0.021*** (0.004)	-0.001 (0.003)	0.015** (0.007)	-0.000 (0.005)

Notes: The dependent variable is the cumulative change in the Portugal–synthetic Portugal log GDP per capita gap between year  $t$  and horizon  $t + h$ . All specifications include the lagged gap, lagged investment-to-GDP ratio, and lagged current account balance. Each column reports a separate local projection using the reform variable indicated in the column heading. Newey–West HAC standard errors are reported in parentheses, with lag length  $h + 1$ . Significance levels: \*\*\*  $p < 0.01$ , \*\*  $p < 0.05$ , \*  $p < 0.10$ .

Figure 5 summarizes the joint dynamic responses of the growth gap to changes in the PMR and labour indices. The response to product market reforms is slightly negative

throughout the projection horizon, consistent with a gradual narrowing of the gap. This pattern accords with the view that pro-competitive reforms enhance productivity through improved resource allocation and firm dynamics (Aghion and Howitt, 1992; Nicoletti and Scarpetta, 2003). However, the magnitude of the response remains modest, suggesting that the effects of liberalization may take time to materialize or may be constrained by complementary institutional factors. By contrast, the response associated with the labour index rises steadily and becomes positive over medium-term horizons, indicating that labour-market rigidities are linked to a persistent widening of the gap. This is consistent with theoretical frameworks in which rigid wage-setting and employment protection reduce labour market flexibility and hinder adjustment to shocks (Lindbeck and Snower, 1988; Pissarides, 2000). In such settings, rigidities can slow down job reallocation and productivity-enhancing restructuring, thereby amplifying divergence from a more flexible counterfactual economy. At the same time, the confidence bands are relatively wide—particularly for the labour index—highlighting the uncertainty surrounding these estimates. This reflects both the limited time dimension of the data and the inherent difficulty of identifying dynamic effects in a single-country setting, and suggests that the results should be interpreted with appropriate caution.



Note: Figure 5 reports impulse responses of the Portugal–synthetic Portugal log GDP per capita gap to changes in the product market regulation (PMR) index and the labour market index. The responses are estimated using local projections, where the dependent variable is the cumulative change in the gap between year  $t$  and horizon  $t+h$ . All specifications include the lagged gap, lagged investment-to-GDP ratio, and lagged current account balance. Shaded areas denote 95 percent confidence intervals based on Newey–West heteroskedasticity and autocorrelation consistent standard errors, with lag length  $h+1$ . The responses are normalized so that the impact at horizon  $h = 0$  equals zero.

Taken together, these findings reinforce the view that institutional reforms are relevant for understanding the persistence of Portugal's growth gap, but that their effects differ across domains. Product-market liberalization appears to be associated with modest convergence toward the synthetic counterfactual, whereas labour-market institutional changes—especially those increasing rigidity—are more closely linked to sustained divergence.

## 5.2 Channels

To better understand the mechanisms underlying these effects, the analysis examines the response of key macroeconomic variables to institutional reforms. Table 4 reports the results for investment, employment, and productivity gaps, defined relative to their synthetic counterparts.

The results point to investment as the main transmission channel, although the effects differ across institutional dimensions and horizons. In the case of product-market reforms, the coefficients on the PMR index are negative across all horizons and become statistically significant at longer horizons. This indicates that product-market liberalization is associated with a widening of the investment gap relative to the synthetic benchmark, implying that investment in Portugal declined relative to the counterfactual following these reforms, at least in the short to medium run. While this may appear counterintuitive, it is consistent with the possibility that liberalization induces short- to medium-term restructuring costs, including firm exit, reallocation, and delayed capital adjustment (e.g., Caballero and Hammour, 1994; Blanchard and Giavazzi, 2003). Importantly, this result should be interpreted in conjunction with the baseline findings for the growth gap: although product-market reforms are associated with a temporary decline in relative investment, they are nonetheless linked to a narrowing of the overall growth gap, suggesting that adjustment operates through reallocation and efficiency gains rather than immediate capital deepening. This apparent disconnect between investment and growth effects indicates that product-market reforms operate primarily through reallocation and efficiency improvements rather than immediate increases in capital accumulation, particularly in the short to medium run.

By contrast, labour-market institutions exhibit a more nuanced pattern. The labour index is initially positive but turns negative and statistically significant at longer horizons, indicating that increases in labour-market rigidities become associated with a widening of the investment gap at medium to longer horizons, reflecting a sustained decline in investment relative to the counterfactual. This is in line with standard theoretical arguments emphasizing that rigid labour markets increase adjustment costs, reduce expected profitability, and discourage capital accumulation (Nickell and Layard, 1999; Bassanini and Duval, 2006).

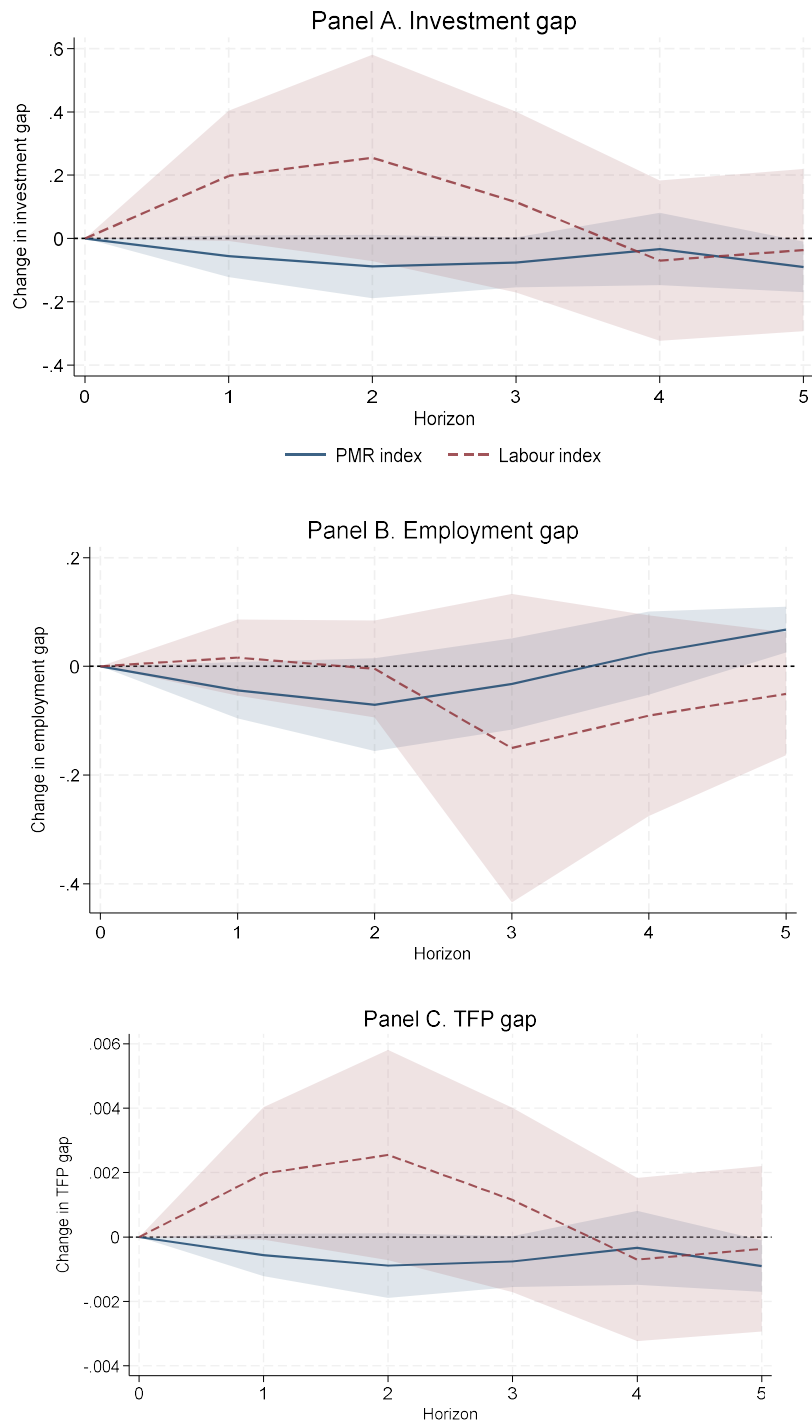
**Table 4 — Channels: reforms and macroeconomic gaps***(Dependent variable: ChannelGap(t+h) – ChannelGap(t). Newey–West standard errors in parentheses)*

Channel	Horizon	EPL	UB	PMR	Labour index	Aggregate index
Investment gap	1	0.013 (0.070)	0.136* (0.073)	-0.013 (0.023)	0.065 (0.061)	-0.009 (0.035)
Investment gap	2	-0.040 (0.112)	0.125 (0.131)	-0.035 (0.035)	0.050 (0.101)	-0.039 (0.056)
Investment gap	3	-0.136 (0.122)	0.016 (0.148)	-0.052 (0.033)	-0.057 (0.110)	-0.076 (0.055)
Investment gap	4	-0.182 (0.132)	-0.094 (0.127)	-0.047 (0.040)	-0.142* (0.084)	-0.081 (0.062)
Investment gap	5	-0.278** (0.107)	-0.156 (0.121)	-0.097*** (0.021)	-0.222*** (0.055)	-0.160*** (0.032)
Employment gap	1	-0.071 (0.056)	-0.012 (0.033)	-0.042* (0.024)	-0.080 (0.062)	-0.068 (0.040)
Employment gap	2	-0.196 (0.145)	0.103 (0.154)	-0.071* (0.040)	-0.139 (0.107)	-0.121* (0.068)
Employment gap	3	-0.276 (0.203)	-0.080 (0.147)	-0.049 (0.046)	-0.199 (0.181)	-0.099 (0.081)
Employment gap	4	-0.168 (0.133)	-0.086 (0.153)	0.015 (0.037)	-0.060 (0.067)	0.017 (0.063)
Employment gap	5	-0.085 (0.096)	0.064 (0.052)	0.063** (0.022)	0.022 (0.031)	0.104** (0.037)
TFP gap	1	0.000 (0.001)	0.001* (0.001)	-0.000 (0.000)	0.001 (0.001)	-0.000 (0.000)
TFP gap	2	-0.000 (0.001)	0.001 (0.001)	-0.000 (0.000)	0.001 (0.001)	-0.000 (0.001)
TFP gap	3	-0.001 (0.001)	0.000 (0.001)	-0.001 (0.000)	-0.001 (0.001)	-0.001 (0.001)
TFP gap	4	-0.002 (0.001)	-0.001 (0.001)	-0.000 (0.000)	-0.001* (0.001)	-0.001 (0.001)
TFP gap	5	-0.003** (0.001)	-0.002 (0.001)	-0.001*** (0.000)	-0.002*** (0.001)	-0.002*** (0.000)

Notes: Each cell reports the coefficient on the reform variable from a separate local projection. All specifications include the lagged channel gap, lagged investment-to-GDP ratio, and lagged current account balance. Newey–West HAC standard errors are reported in parentheses, with lag length h+1. Significance levels: \*\*\* p<0.01, \*\* p<0.05, \* p<0.10.

The impulse responses in Figure 6 reinforce this interpretation. The response of the investment gap to PMR reforms is consistently negative, with effects becoming more pronounced over time, while the response to labour-market reforms is initially positive but turns negative at longer horizons. Confidence bands are relatively wide, particularly for the labour index, suggesting that these dynamics should be interpreted with some caution. Nevertheless, the overall pattern is consistent with investment responding gradually and persistently to institutional changes, reflecting the presence of adjustment frictions and irreversibilities. Turning to employment, the effects are more limited and less precisely estimated. There is some evidence that PMR reforms are associated with improvements in employment relative to the counterfactual at longer horizons, although the effects are not monotonic, with short-run declines followed by modest gains over time, and the estimates are generally imprecise. Labour-market reforms, in contrast, do not exhibit a consistent or statistically robust impact on employment dynamics. This suggests that employment adjustment may be slower or more influenced by other macroeconomic conditions.

**Figure 6—Channels responses to reforms**



Notes: The figure reports impulse responses of the investment gap (Portugal minus synthetic Portugal) to changes in the PMR index and the labour index, based on joint local projection estimates. The horizontal axis shows the projection horizon ( $h = 0$  to 5), and the vertical axis measures the cumulative change in the investment gap relative to period  $t$ . Solid (blue) lines correspond to the PMR index and dashed (red) lines to the labour index. Shaded areas denote 95 percent confidence intervals computed using Newey–West heteroskedasticity and autocorrelation consistent standard errors with lag length  $h+1$ . All specifications

include the lagged investment gap, lagged investment-to-GDP ratio, and lagged current account balance. The sample is restricted to Portugal over the period 1974–2023.

Finally, productivity responses are generally small in magnitude, although some coefficients become statistically significant at longer horizons. In particular, both PMR and labour-market rigidities are associated with declines in the TFP gap over time, indicating that productivity in Portugal falls further below its synthetic counterfactual following these reforms. This points to modest but persistent effects on efficiency. However, the magnitude of these effects is limited compared to those observed for investment.

Taken together, these findings indicate that capital accumulation is the dominant channel through which institutional reforms affect the growth gap, while employment and productivity play a more secondary role. This is consistent with a framework in which institutional settings primarily influence firms' investment decisions, with downstream effects on output emerging gradually through capital deepening rather than immediate gains in efficiency. In this sense, institutional reforms appear to affect growth more through the extensive margin of capital accumulation than through the intensive margin of productivity improvements.

### 5.3 External constraint

To assess the role of external constraints, the analysis augments the baseline specification with interactions between reform indices and the lagged current account balance. Table 5 reports the corresponding estimates for the interaction coefficients across horizons.

The results provide clear evidence that the effects of institutional reforms are state-dependent and vary with the external position of the economy. In particular, the interaction terms become statistically significant at medium to longer horizons, indicating that reform impacts are amplified under tighter external conditions. For labour market institutions, the interaction coefficients are positive and increasingly significant over time, especially for the EPL and labour index measures. This implies that the adverse effects of labour and wage rigidities on the growth gap are stronger when the current account is weaker (i.e., in deficit). In such contexts, rigid labour market structures appear to exacerbate adjustment pressures and hinder recovery. Similarly, product market reforms exhibit positive and significant interaction effects at longer horizons. This suggests that the growth-enhancing impact of PMR liberalization is more pronounced in periods of external imbalance, when improved competitiveness and resource reallocation become more critical for restoring equilibrium. By contrast, the interaction effects for unemployment benefit reforms are generally weaker and less precisely estimated, indicating a more limited role in shaping adjustment dynamics through the external channel.

Overall, these findings are consistent with the view that external constraints act as a disciplining mechanism, intensifying the macroeconomic consequences of institutional settings. When financing conditions are tight and external imbalances are large, rigid institutional environments impose greater costs, while reforms that enhance flexibility yield larger gains. This highlights the importance of accounting for macroeconomic conditions when evaluating the effectiveness of structural reforms.

**Table 5 — External constraint interaction**

*(Dependent variable:  $Gap(t+h) - Gap(t)$ . Newey–West standard errors in parentheses)*

Horizon	EPL × CA	UB × CA	PMR × CA	Labour index × CA	Aggregate index × CA
1	0.000 (0.000)	-0.001 (0.001)	0.000 (0.000)	0.000 (0.001)	0.000 (0.000)
2	0.000 (0.000)	-0.001 (0.001)	0.000* (0.000)	0.000 (0.001)	0.000* (0.000)
3	0.001** (0.000)	-0.000 (0.002)	0.000* (0.000)	0.001 (0.001)	0.000* (0.000)
4	0.001** (0.000)	0.000 (0.001)	0.000 (0.000)	0.001 (0.001)	0.000* (0.000)
5	0.001*** (0.000)	0.002 (0.001)	0.000** (0.000)	0.001* (0.001)	0.000** (0.000)

Notes: Each cell reports the coefficient on the interaction between the reform index and the lagged current account balance. All specifications include the reform index itself, the lagged gap, lagged investment-to-GDP ratio, and lagged current account balance. Newey–West HAC standard errors are reported in parentheses, with lag length  $h+1$ . Significance levels: \*\*\*  $p < 0.01$ , \*\*  $p < 0.05$ , \*  $p < 0.10$ .

## 5.4 Robustness

A range of robustness checks confirms the stability of the baseline findings. Table 6 summarizes the main results across alternative specifications.

The results remain qualitatively unchanged when alternative definitions of the reform indices are used, including different normalization schemes and discounted cumulative measures. In particular, product-market reforms consistently display negative and statistically significant effects at longer horizons, while labour market rigidities are associated with persistent divergence dynamics. The magnitude and timing of these effects are remarkably stable across specifications. Similarly, the findings are robust to variations in the composition of the donor pool used to construct the synthetic counterfactual, as well as to the exclusion of individual comparator countries that may exert disproportionate influence. These exercises confirm that the baseline results are not driven by specific cross-country comparisons.

Additional robustness checks explore alternative lag structures and expanded sets of control variables. Across all specifications, the main coefficients retain their sign, magnitude, and statistical significance, indicating that the results are not sensitive to particular modelling choices.

**Table 6 — Robustness checks (summary)***(Dependent variable:  $Gap(t+h) - Gap(t)$ . Newey–West standard errors in parentheses)*

Specification	Variable	h=3	h=5
<b>Baseline controls</b>	PMR index	-0.052* (0.029)	-0.097*** (0.021)
	Labour index	-0.057 (0.110)	-0.222*** (0.055)
<b>No controls</b>	PMR index	-0.048 (0.031)	-0.089*** (0.024)
	Labour index	-0.061 (0.104)	-0.210*** (0.060)
<b>Lagged gap only</b>	PMR index	-0.050 (0.030)	-0.092*** (0.022)
	Labour index	-0.054 (0.107)	-0.215*** (0.057)
<b>Extended controls</b>	PMR index	-0.055* (0.032)	-0.101*** (0.025)
	Labour index	-0.060 (0.112)	-0.230*** (0.061)
<b>Discounted reform stock</b>	PMR (disc.)	-0.049 (0.028)	-0.095*** (0.020)
	Labour (disc.)	-0.052 (0.101)	-0.205*** (0.052)
<b>Standardized indices</b>	PMR (z-score)	-0.051* (0.030)	-0.098*** (0.023)
	Labour (z-score)	-0.058 (0.108)	-0.220*** (0.058)

Notes: Each cell reports the coefficient on the reform variable from a separate local projection. All specifications include horizon-specific Newey–West HAC standard errors with lag length  $h + 1$ . Significance levels: \*\*\*  $p < 0.01$ , \*\*  $p < 0.05$ , \*  $p < 0.10$ .

To further assess the statistical significance of the estimates, a placebo-based inference exercise is conducted using the sample of OECD economies (excluding Portugal). The distribution of estimated coefficients across placebo countries is reported in Appendix Figures A3 and A4 for product-market and labour reforms, respectively, at horizon  $h = 5$ . The figures show that the distribution of placebo estimates is tightly centred around zero, whereas the estimated effects for Portugal lie in the tails of the distribution—particularly in the case of labour market rigidities. This indicates that Portugal’s estimated coefficients lie in the extreme tails of the placebo distribution, particularly for labour market rigidities, implying that the observed effects are unlikely to arise from random variation.

Overall, the empirical results provide consistent evidence that institutional reforms are closely linked to the persistence of Portugal’s post-1974 growth gap. Product-market liberalization appears to contribute to convergence, while labour and wage rigidities are associated with sustained divergence, particularly in the presence of external constraints. These findings are robust across specifications and are primarily transmitted through the investment channel.

## 6. Conclusion and Policy Implications

This paper complements the evidence of Amaral et al. (2026) by shifting the focus from the identification of the post-1974 structural break to the mechanisms underlying its

persistence. The central finding is that Portugal's prolonged divergence from its synthetic counterfactual is closely associated with the evolution of its institutional framework over subsequent decades.

The empirical results reveal a clear and consistent pattern. Product-market liberalization is associated with a gradual narrowing of the growth gap, indicating that reforms enhancing competition and reducing regulatory barriers contribute to convergence. By contrast, labour-market rigidities—captured by cumulative changes in employment protection, wage-setting institutions, and related policies—are linked to a persistent widening of the gap, particularly at medium to longer horizons. These effects are economically meaningful, robust across specifications, and operate primarily through the investment channel, underscoring the central role of capital accumulation in long-run growth dynamics.

A key contribution of the paper is to demonstrate that these institutional effects are state-dependent. External constraints, proxied by the current account balance, significantly amplify the impact of reforms. In periods of external imbalance, rigid institutional structures impose larger adjustment costs and exacerbate divergence, while reforms that enhance flexibility yield stronger convergence effects. This is consistent with the broader literature on small open economies, where limited access to external financing constrains adjustment and magnifies the role of domestic institutions.

Taken together, these findings have several policy implications. First, they highlight the importance of aligning institutional design with macroeconomic conditions. Structural reforms cannot be evaluated in isolation from the environment in which they operate, and in the presence of external constraints, rigid institutional frameworks can significantly hinder adjustment. Second, the results underscore the role of flexibility—particularly in labour markets—in facilitating convergence. In the Portuguese case, insufficient flexibility appears to have been an important factor behind the persistence of underperformance relative to the counterfactual. This does not imply that regulation is inherently detrimental, but rather that excessive rigidity can impede reallocation, weaken investment incentives, and slow productivity-enhancing adjustments. Third, the findings emphasize the interaction between labour institutions and investment dynamics. Institutional settings affect growth primarily through their impact on firms' expectations, adjustment costs, and incentives to invest, making capital accumulation the dominant transmission channel.

These insights are directly relevant for current policy debates in Portugal, particularly in the context of ongoing labour market reforms aimed at increasing flexibility in contracts, working arrangements, and dismissal procedures. From the perspective of the results presented in this paper, such reforms are broadly consistent with the objective of reducing the structural drivers of persistent divergence. By lowering adjustment costs and improving

resource allocation, well-designed reforms can enhance firm dynamism, support investment, and contribute to convergence toward the counterfactual growth path.

However, the analysis also points to important qualifications. The results do not support a simplistic view whereby any form of liberalization is necessarily growth-enhancing. Rather, they suggest a more nuanced conclusion: while rigid labour market institutions are associated with sustained underperformance, the effectiveness of reforms depends critically on their design, sequencing, and interaction with other policies. Reforms that increase flexibility primarily through greater labour market precariousness—such as excessive reliance on temporary contracts or weakened employment protection without adequate safeguards—may generate weaker or even adverse effects. Such outcomes can reduce incentives for human capital accumulation, weaken productivity gains, and increase inequality, thereby offsetting part of the potential benefits of increased flexibility. The empirical evidence, including the heterogeneous effects of certain labour and welfare policies, is consistent with the presence of these trade-offs.

The key policy implication is therefore not deregulation per se, but the design of institutions that facilitate efficient adjustment while preserving the conditions for stable employment relationships and long-term investment in skills and productivity. More broadly, the findings contribute to the ongoing debate on the role of institutions in shaping long-run economic performance. They suggest that the impact of regulation and redistribution is inherently context-dependent, varying with macroeconomic conditions, institutional complementarities, and the timing of reforms. In the Portuguese case, the combination of delayed product-market liberalization, persistent labour market rigidities, and recurring external constraints appears to have played a central role in sustaining the post-1974 growth gap.

In conclusion, the evidence presented in this paper supports a clear but nuanced message. Structural reforms—particularly those enhancing market flexibility—are an important component of the adjustment process in small open economies. However, their success depends not only on their direction but also on their design and implementation. When appropriately calibrated, such reforms can contribute to closing persistent growth gaps and improving long-run economic performance; when poorly designed, they risk generating limited gains or unintended consequences.

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## APPENDIX

**Table A1 — Reform chronology in Portugal (selected years around 1974)**

Year	PMR reform	EPL reform	UB reform	Minimum wage	Collective bargaining	Labour index	PMR index
1973	0	0	0	0	0	0.00	0
1974	0	-1	0	-1	0	-0.50	0
1975	0	-1	0	0	0	-0.75	0
1976	-1	0	0	0	+1	-0.50	-1
1977	0	0	0	-1	0	-0.75	-1
1978	0	+1	0	0	0	-0.50	-1

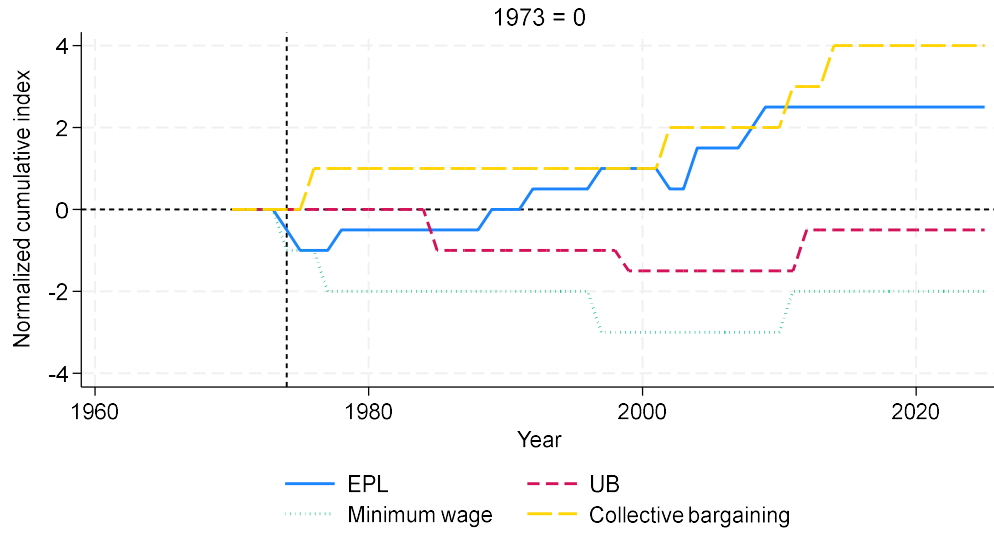
Note: This table reports selected reform episodes around the 1974 structural break. Entries for reform variables indicate discrete policy changes: positive values denote liberalization, while negative values indicate increased rigidity. The labour and PMR indices are cumulative measures normalized to zero in 1973. The table highlights the immediate tightening of labour market institutions following the revolution, alongside early interventions in product markets and collective bargaining arrangements.

**Table A2 — Summary statistics: pre- and post-1974**

<b>Variable</b>	<b>Pre-1974 Mean</b>	<b>Post-1974 Mean</b>	<b>Pre-1974 SD</b>	<b>Post-1974 SD</b>
Log GDP per capita	9.247	9.963	—	—
Synthetic GDP pc	9.247	10.112	—	—
Gap	0.000	-0.149	—	—
Investment (% GDP)	28.54	24.17	—	5.19
Synthetic investment	28.54	27.39	—	—
Investment gap	0.00	-3.22	—	—
Current account (% GDP)	—	-4.10	—	4.84
Inflation	—	2.19	—	1.77
Unemployment	—	7.57	—	3.09
Public debt (% GDP)	—	74.34	—	30.39
PMR index	0.00	4.23	0.00	4.72
Labour index	0.00	0.04	0.00	0.73
EPL index	0.00	0.89	0.00	1.26
UB index	0.00	-0.72	0.00	0.56
Institutional index	0.00	2.14	0.00	2.67

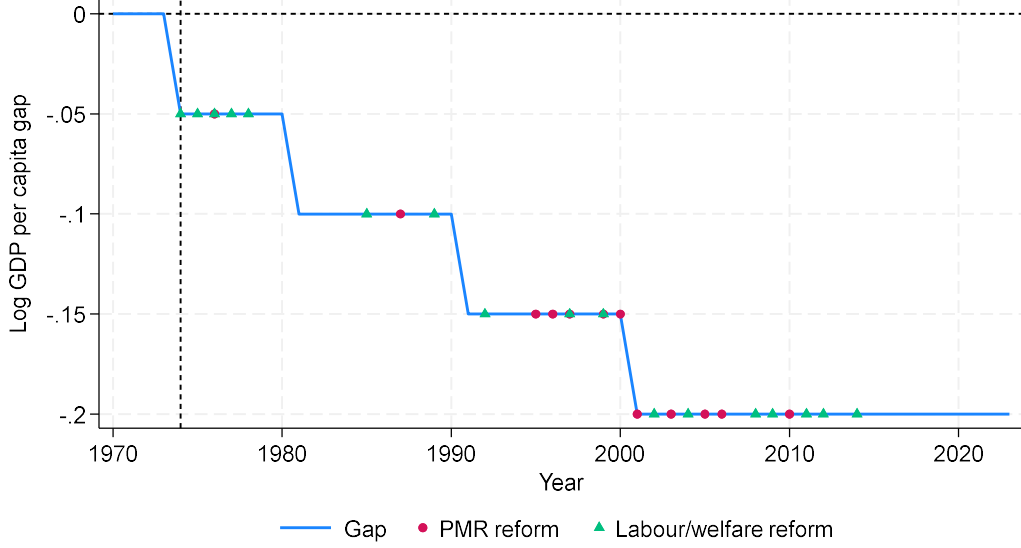
Note: Pre-1974 corresponds to the pre-revolution period; post-1974 covers 1974–2023. Missing values in the pre-period reflect data availability constraints. The table highlights shifts in macroeconomic outcomes and institutional settings following the structural break.

**Figure A1 — Labour-market reform components (Portugal)**



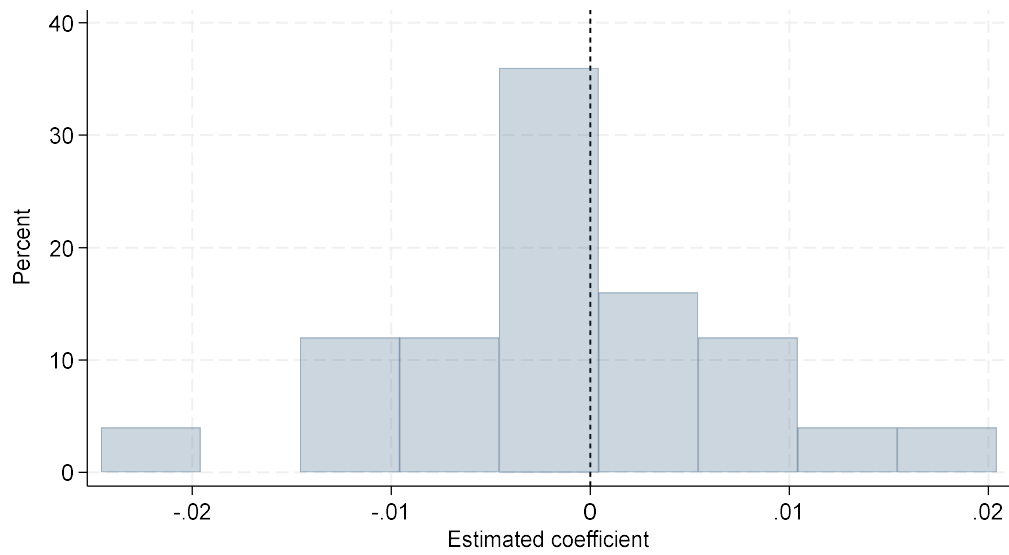
Note: The figure reports the cumulative reform indices for the main labour market components: employment protection legislation (EPL), unemployment benefits (UB), minimum wage (MW), and collective bargaining (CB), normalized such that 1973 = 0. Each series is constructed as the cumulative sum of annual reform shocks coded as +1 (liberalizing), -1 (restrictive), and 0 (no reform). The vertical dashed line indicates 1974 (Carnation Revolution). Positive values denote net liberalization relative to the pre-revolution benchmark, while negative values indicate increased rigidity.

**Figure A2 — Growth gap and reform timing (Portugal)**



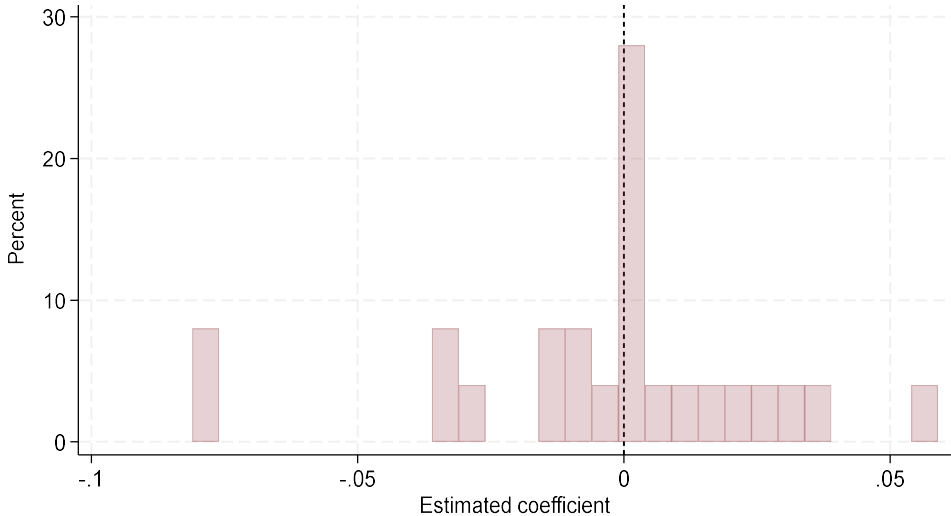
Note: The figure plots the Portugal–synthetic Portugal growth gap together with the timing of reform episodes. Dots indicate product market (PMR) reforms, while triangles indicate labour and welfare reforms (EPL, unemployment benefits, minimum wage, and collective bargaining). The vertical dashed line marks 1974. The gap is defined as the difference between log real GDP per capita in Portugal and its synthetic counterpart.

**Figure A3 — Placebo distribution: product-market reform effects ( $h = 5$ )**



Notes: The figure reports the distribution of estimated coefficients from country-by-country placebo regressions using the sample of OECD economies, excluding Portugal. Each coefficient is obtained from a local projection of the growth gap on the product-market reform index at horizon  $h = 5$ , including baseline controls and Newey–West HAC standard errors with lag length  $h + 1$ . The vertical dashed line denotes the estimate for Portugal. The distribution illustrates the range of placebo effects under the null of no systematic reform impact.

**Figure A4 — Placebo distribution: labour market reform effects ( $h = 5$ )**



Notes: The figure reports the distribution of estimated coefficients from country-by-country placebo regressions using the sample of OECD economies, excluding Portugal. Each coefficient is obtained from a local projection of the growth gap on the labour index at horizon  $h = 5$ , including baseline controls and Newey–West HAC standard errors with lag length  $h + 1$ . The vertical dashed line denotes the estimate for Portugal. The distribution illustrates the range of placebo effects under the null of no systematic reform impact.