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Do Radical-Right Governments Suppress Innovation?

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Abstract

An extensive body of research has shown that innovation is heavily influenced by the political environment in which firms operate, shaping the conditions under which it emerges and persists. Amid the surge of support for radical-right parties in Europe, this thesis examines whether radical-right government participation is associated with a decrease in innovation activity and output. This participation is measured by the presence of at least one radical-right party in the governing coalition. Unlike mainstream parties, radical-right parties are more strongly defined by cultural and political positions, including restrictive immigration preferences, weaker trust in scientific institutions, and nationalist attitudes toward international collaboration. To test this relationship, we use panel data from 27 European OECD countries between 2001 and 2022, combining government composition data with party ideology scores from the Chapel Hill Expert Survey. To capture both innovation activity and realised innovation output, we use patents filed and trademark applications alongside granted patents and registered trademarks. The empirical strategy is a panel OLS specification with country and year fixed effects, standard errors clustered at the country level, and a standard set of macroeconomic, demographic, and innovation-system controls. Identification rests on within-country variation between radical-right and non-radical-right years rather than on cross-country comparisons. The results show that radical-right government participation is not significantly associated with realised innovation output but is negatively associated with innovation activity. This may reflect that filings respond to current conditions, while grants and registrations follow longer approval processes and may reflect earlier political environments. While the results do not establish causality, they point to a negative association between radical-right government participation and innovation activity.

Keywords: radical-right government, innovation, patents, trademarks, ideology
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1. Introduction

The inspiration for this thesis originated from the true-story-based film *The Boy Who Harnessed the Wind*. It tells the story of a Malawian boy who builds a windmill to generate electricity and provide water for his village during a severe drought, transforming a struggling community into a self-sustaining one. It illustrates how a simple, yet novel solution can fundamentally improve the economic conditions of a society. Extending this insight to a broader scale, recent economic Nobel Prize-winning research by Aghion and Howitt demonstrates that innovation has fundamentally changed societies. This literature establishes that sustained economic growth is driven by technological progress through a continuous process of creative destruction (Aghion and Howitt, 1992).

Building on this perspective, it becomes important to consider the conditions under which innovation emerges and persists. In particular, this thesis examines how the political environment, and more specifically radical-right government participation, is associated with innovation outcomes.

Radical-right parties have, in recent years, experienced a sustained rise in electoral support and political influence across Europe. Evidence from the most recent European Parliament elections highlights growing support for populist radical-right parties and an increasingly fragmented and polarised political landscape (Hobolt et al., 2026). These developments are part of a broader backlash against globalisation. Rising protectionism, techno-nationalism, and state intervention are reshaping the openness of the global economic system and the conditions for international cooperation and innovation (Petricevic and Teece, 2019).

This shift is particularly important in the context of innovation. A large body of economic literature shows that innovation benefits from openness and international collaboration (Grossman and Helpman, 1991). Cross-border flows of knowledge generate positive spillovers that enhance productivity and technological progress (Coe and Helpman, 1995). At the firm level, these effects are reinforced by firms' ability to absorb and apply external knowledge, while knowledge diffusion across countries further supports innovative activity (Cohen and Levinthal, 1990; Coe and Helpman, 1995). As a result, greater economic integration facilitates the spread of ideas and contributes to long-run growth.

However, recent developments, such as geopolitical tensions, the COVID-19 pandemic, and rising political instability, have contributed to a more fragmented global environment (Antràs, 2020). In the European context, these dynamics are reflected in increasing political fragmentation and polarisation, which are reshaping policy priorities and the broader institutional environment (Hobolt et al., 2026). Consequently, the growing prominence of more inward-looking and nationally oriented political ideologies raises important questions. Such shifts may affect openness, knowledge flows, and broader conditions under which innovation is generated and sustained.

1.1 Previous Research

The relationship between politics and innovation has attracted substantial scholarly attention. Early foundational work established that political and institutional structures shape not only whether innovation happens, but also its nature. Akkermans et al. (2009) show that different political-economic systems produce systematically different innovation patterns, with some favouring radical breakthroughs and others incremental improvements. North (1991) extends this argument by showing that institutions structure incentives through rules, property rights, and constraints on political and economic behaviour, thereby shaping the conditions for investment and long-run development. Mazzucato (2013) adds another dimension, arguing that governments are not passive bystanders but active drivers of innovation, often bearing the risks that private actors are unwilling to take.

Other researchers have taken different angles, shifting attention from broad institutional structures toward the specific ideological character of governments. Wang et al. (2019) examines how the left–right orientation of governing parties relates to innovation across countries. Their findings suggest that left-wing governments are associated with lower innovation output, whereas right-wing governments tend to promote it, reflecting differences in markets, taxation, and regulation. Bennett et al. (2023) focus on political rhetoric. They show that populist discourse by a sitting head of government creates uncertainty about the institutional environment, discouraging entrepreneurship. More recently, Rodríguez-Pose et al. (2025) show that electoral support for extreme right-wing parties in European regions is associated with lower research output and innovation, particularly in green sectors.

1.2 Our Contribution

Although the research on this topic is extensive, there is a notable gap in the focus on how radical-right parties affect innovation when they are in government. Wang et al.'s (2019) analysis is closely related, as it examines the ideology–innovation relationship but approaches it through a broad economic lens, measuring government orientation on a general left–right spectrum without distinguishing radical parties from mainstream ones. Bennett et al. (2023) examine the populist and cultural effects of ideology on innovation but focus on the discourse of the head of government rather than the ideological composition of the governing coalition. Rodríguez-Pose et al. (2025) examine support for radical-right parties through vote shares but stop short of assessing how these parties exercise political power once in government.

Drawing on the complementary strengths of these three studies, this thesis constructs a research design that none of them individually addresses. Following Wang et al. (2019), we examine the relationship between governing ideology and innovation, measured through patents and trademarks. We focus on radical-right parties and broaden the measure of ideology beyond economic positioning to capture parties' overall political stance. Additionally, we distinguish between innovation activity and output, allowing us to assess whether political ideology is more closely associated with the decision to innovate or with innovation quality. Building on Bennett et al. (2023), we examine the cultural and institutional uncertainty generated by radical-right politics, extending the analysis from leaders' rhetoric to the presence of such parties in government. Finally, we move beyond Rodríguez-Pose et al. (2025) by focusing not on electoral support but on the entry of these parties into governing coalitions, where they can actively shape policy. The analysis is restricted to European OECD countries, reflecting the European focus of the theoretical framework and the data requirements, as discussed in detail in the methodology section.

1.3 Hypothesis

Since innovation policy is shaped by governments, whose priorities are influenced by political ideology, an important question is whether government ideology affects innovation. This thesis therefore asks the following research question: Does radical-right government participation affect innovation in European OECD countries?

We test the hypothesis:

H1*: Radical-right government participation is negatively associated with innovation compared to periods without radical-right participation in government.*

To test this relationship, we use panel regressions with country and year fixed effects. Innovation is measured using patents and trademarks, distinguishing between applications and grants. Radical-right government participation is measured by combining party ideology data with government composition data.

Our main findings suggest that radical-right government participation is not significantly associated with completed innovation outcomes but is negatively associated with innovation activity. This indicates that radical-right participation may affect the decision to begin innovating before such effects appear in final innovation output.

The remainder of this thesis is organised as follows. Section 2 reviews the literature and theories related to political ideology, radical-right parties, and innovation. Section 3 presents the econometric model, data sources, variables, and sample construction. Section 4 provides the descriptive statistics, empirical results, and robustness tests. Section 5 discusses the findings, limitations, and implications. Section concludes.

2. Literature Review

2.1 The Economic Role of Innovation

Innovation is a key driver of economic and societal development. By improving productivity and enabling new technologies, it contributes to long-run economic growth and rising living standards (Aghion and Howitt, 1992). These effects extend beyond individual firms, as innovation facilitates the diffusion of knowledge across firms and countries, supporting processes such as industrialisation, economic integration, and globalisation (Grossman and Helpman, 1991; Coe and Helpman, 1995). In doing so, technological development often generates positive externalities, as knowledge can spread through imitation and diffusion to other firms and the wider economy (Bloom et al., 2019; Dolfsma, 2013). Because knowledge builds on previous discoveries, innovation can generate self-reinforcing dynamics that sustain technological progress over time (Romer, 1990). Extending this argument, path dependency implies that earlier technological and policy choices can shape future innovation trajectories by creating self-reinforcing patterns that make some pathways more likely than others (Onufrey and Bergek, 2015). As these dynamics unfold, innovation not only increases overall output but also drives structural change by enabling the emergence of new industries and shifting economic activity toward more productive sectors (Aghion and Howitt, 1992). In this way, innovation becomes an important determinant of national competitiveness, shaping countries' ability to sustain productivity growth and compete in global markets (Fagerberg, 1996). Because innovation is not directly observable, empirical research typically relies on observable outputs as proxies (Griliches, 1990).

2.2 How Innovation Emerges

At the microeconomic level, innovation originates from decisions made by firms and individuals to invest in new ideas, technologies, and processes. These decisions depend on expected returns, costs, and the broader economic environment in which firms operate (Aghion et al., 2015; Bloom et al., 2019). Innovation also relies heavily on the availability of knowledge and human capital. Firms must possess the capability to generate, absorb, and apply new knowledge, often building on existing ideas through processes of learning and diffusion (Cohen and Levinthal, 1990; Griliches, 1990). Together, these factors suggest that innovation is fundamentally driven by firm-level decisions**.**

2.3 The Government's Role in Innovation

However, these decisions do not occur in isolation. The broader institutional and policy environment plays a central role in shaping the incentives, constraints, and expectations faced by firms. In particular, governments influence innovation by altering the conditions under which these decisions are made. Because innovative activity generates positive externalities, firms are often unable to capture the full returns from their investments, as knowledge can diffuse to competitors and the wider economy (Bloom et al., 2019; Dolfsma, 2013). As a result, reliance on market mechanisms alone may lead to underinvestment, creating a clear justification for government intervention to support innovation (Jones and Williams, 1998).

In practice, governments shape innovation through a range of policy instruments. Policies such as R&D tax credits, direct public funding, and subsidies reduce the cost and risk associated with innovative activity, thereby encouraging firms to invest in research and development (Bloom et al., 2019). However, this relationship should not be understood only through policies explicitly designed to support innovation. Flanagan et al. (2011) argue that innovation is influenced by a wider policy mix, in which different policy instruments, institutions, actors, and levels of government interact. This implies that policies not primarily aimed at innovation, such as those related to education, taxation, or regulation, can nonetheless shape innovative activity.

Given this diversity of policy channels, the effectiveness of government intervention is not guaranteed. As Dolfsma (2013) emphasises, the impact of policy depends on its design, implementation, and suitability to the institutional context. Consistent with this, the effectiveness of innovation policies varies significantly depending on how they are designed and targeted (Bloom et al., 2019). Poorly designed policies may fail to provide appropriate incentives, while well-targeted interventions can significantly enhance innovative activity (Aghion et al., 2015). Governments therefore play a central role in shaping the conditions under which innovation emerges and persists over time.

2.4 Channels of Political Influence on Policy

Before turning to differences in political ideology, it is important to clarify how political parties influence government policy and, by extension, the conditions under which innovation

takes place. Political parties affect policy outcomes through several distinct channels, both within and outside formal government participation.

The most direct channel operates through participation in the governing coalition. Parties that hold ministerial positions exercise executive power by shaping policy agendas and controlling specific portfolios. Martin and Vanberg (2005) show that coalition agreements structure how policy priorities are implemented, while Sagarzazu and Klüver (2017) demonstrate how ministerial control allows parties to influence policy outputs. Through these mechanisms, governing parties directly affect areas relevant for innovation, such as regulation, taxation, education, and research funding.

However, political influence is not limited to parties in government. Parties outside the governing coalition can also shape policy through agenda-setting and political competition. Seeberg (2013) shows that opposition parties can influence policy by shifting public debate and exerting pressure on governing parties, even without holding executive office. This influence operates through electoral competition and changes in the broader political discourse.

Taken together, these channels suggest that political parties can affect innovation both directly, through executive decision-making, and indirectly, by shaping the policy environment and public agenda. This distinction is particularly relevant when analysing the role of different ideological positions, as their influence may extend beyond formal participation in government.

2.5 Ideology and Innovation: Left vs. Right

Left- and right-wing governments affect innovation through different policy priorities. Classical partisan theory links the left more closely to labour, employment, and redistribution, while the right is associated with capital, price stability, and market-oriented policy (Hibbs, 1977; Alesina, 1987). Left-wing governments support innovation indirectly through public education, social investment, and the development of skilled labour (Busemeyer, 2009). In contrast, right-wing governments are associated with more market-oriented policies, including product-market deregulation, greater economic freedom, and stronger incentives for investment (Potrafke, 2010; Castro and Martins, 2021; Aidt et al., 2018). Ideology therefore shapes innovation through different channels: the left through public investment and human

capital, and the right through market liberalisation and investment-oriented policies. Consistent with this, Wang et al. (2019) find that left-wing governments are linked to lower patent and trademark activity, while right-wing governments are associated with higher levels of technological innovation.

2.6 Defining the Radical-Right

Mudde (2007, p. 12) identifies 'terminological chaos' in the study of far-right parties, noting that scholars use multiple labels, such as 'extreme-right,' 'far-right,' and 'radical-right,' without clearly defining them. To avoid this ambiguity, this thesis uses 'radical-right' to refer to parties that share the ideological core of nativism, populism, and authoritarianism (Mudde, 2007, pp. 22–23).

2.6.1 The Distinctiveness of Radical-Right Parties

Radical-right parties diverge from classical partisan theory, as they do not take a consistent left–right position on economic policy (Rathgeb and Busemeyer, 2022). They often adopt elements from both sides. Rovny and Polk (2020) show that radical-right parties may combine left-leaning welfare appeals with right-leaning proposals such as lower taxes, cost-cutting, or market-friendly policies. However, these positions are often framed through nationalism, immigration, and deservingness, meaning that welfare, taxation, and public spending are linked less to general redistribution or free-market principles and more to which groups are perceived as deserving of support (Rathgeb and Busemeyer, 2022). In welfare policy, this can mean defending welfare for native citizens and stable labour-market groups while supporting welfare retrenchment for non-citizens and weaker trade-union power (Rathgeb, 2021). This also shapes the type of welfare policy radical-right parties support. They tend to defend traditional benefits, especially pensions, but are more sceptical of social investment policies linked to education, gender equality, and labour-market inclusion. This matters for innovation because social investment supports human capital and labour-market participation, through which long-term productivity can increase (Enggist and Pinggera, 2022).

2.7 The Political Influence of Radical-Right Parties

Support for radical-right parties is often linked to broader forms of economic and cultural insecurity. Rather than being driven solely by economic downturns, voter support is associated with perceived threats related to globalisation (Kriesi et al., 2006), immigration

(Dustmann et al., 2019), cultural change (Bornschier, 2010), and relative economic decline (Schraff and Pontusson, 2024). These factors often reinforce each other, with immigration becoming central to wider anxieties about economic security, social order, and national identity (Rydgren, 2008). Empirical evidence further suggests that globalisation shocks have contributed to the rise of radical-right support (Colantone and Stanig, 2019).

When this support translates into political influence, radical-right parties are increasingly able to shape policy outcomes and the broader political environment. Their influence extends beyond direct participation in government. On issues such as immigration and integration, radical-right and mainstream-right parties often hold similar positions, differing primarily in intensity. Radical-right parties tend to promote more nationalist and restrictive policies, influencing policy both directly and indirectly by shifting the political agenda and pressuring mainstream parties (Akkerman, 2012). In response, mainstream-right parties may emphasise these issues more strongly to retain electoral support when faced with radical-right competition (Downes and Loveless, 2018). In this sense, radical-right parties can influence which issues receive political attention and policy focus, even when they are not part of the governing coalition. This reflects the agenda-setting channel discussed in Section 2.4, through which parties can indirectly shape policy priorities even without participating in government.

2.8 Radical-Right Politics and Innovation

These dynamics are particularly relevant for innovation through their effects on immigration policy. Restrictive immigration policies may reduce access to skilled scientific and technical labour, which plays an important role in innovation. Skilled migrants contribute not only through their individual capabilities but also by generating knowledge spillovers and increasing the diversity of ideas, both of which support innovation (Hunt and Gauthier-Loiselle, 2010; Nathan and Lee, 2013).

At the same time, the literature highlights potential countervailing mechanisms. Restrictions on low-skilled immigration may encourage firms to adopt labour-saving technologies, potentially stimulating certain forms of innovation (San, 2023). Similarly, a stronger focus on national sovereignty may promote investment in domestic technological capabilities in specific sectors (Edler et al., 2023).

However, these potential gains are likely to be outweighed by broader constraints on knowledge flows and human capital. Reduced openness to skilled migration, weaker international collaboration, and lower trust in scientific expertise may weaken the conditions

needed for sustained innovation (Borins, 2018; Colantone and Stanig, 2019; Rodríguez-Pose et al., 2025). This is particularly important in the longer run, as innovation depends on the accumulation of human capital and the spread of knowledge over time (Aghion et al., 2015; Coe and Helpman, 1995). Overall, while some substitution effects may encourage specific types of innovation, the balance of evidence points to a more negative impact.

2.9 Hypothesis Statement

The literature suggests that radical-right parties differ from conventional left–right dynamics. In particular, their economic positions are less clearly defined and often secondary to their emphasis on nativism, authoritarianism, and populism. As a result, their impact on innovation is expected to operate primarily through cultural and institutional channels rather than through standard market or welfare policies.

Although some mechanisms may generate limited positive effects, the broader literature suggests that radical-right politics is more likely to undermine the conditions that support innovation through reduced openness, weaker reliance on expertise, lower levels of international cooperation, and more restrictive immigration policies. Overall, this points to a negative association between radical-right government participation and innovation.

Accordingly, we test the following hypothesis:
H1: *Radical-right government participation is negatively associated with innovation compared to periods without radical-right participation in government.*

3. Methodology

3.1 Estimation Method

We conduct a panel association study in which the unit of observation is a country's innovation output in a given year, measured by granted patents, patent filings, registered trademarks, and trademark applications. Our goal is to estimate the association between radical-right participation and innovation output across 27 European OECD countries from 2001 to 2022. This approach follows panel-data methods designed to address unobservable unit-specific effects and the challenges of time-series cross-section data (Hausman and Taylor, 1981; Beck and Katz, 1995).

Compared with cross-sectional analysis, panel data offer two main advantages for this study. First, panel data help reduce omitted-variable bias by controlling for unobserved country-specific heterogeneity. Second, they combine differences across countries with changes over time, allowing us to examine whether shifts in government ideology within countries are associated with changes in innovation outcomes (Mundlak, 1978; Hausman and Taylor, 1981).

We use a panel OLS approach rather than the System GMM estimator used by Wang et al. (2019). System GMM is designed to address potential endogeneity by using instruments based on lagged values of the variables. However, this method requires the number of instruments to remain limited relative to the number of countries (Roodman, 2009). In our sample, the number of instruments becomes large relative to the number of countries, which can lead to unreliable estimates.

The model includes country fixed effects, which absorb time-invariant country characteristics, such as geography, legal traditions, and institutional quality, that may confound the ideology–innovation relationship (Wooldridge, 2005). With this model, we acknowledge the potential for endogeneity. While fixed effects mitigate bias from time-invariant confounders, within-country time-varying endogeneity may persist. Consistent with Rodríguez-Pose et al. (2025), we therefore interpret the results as associations rather than causal estimates. The regression equation is

$$Innovation_{i,t} = \alpha + \beta_1 RadRightGov_{i,t} + \gamma Innovation_{i,t-1} + \beta' X_{i,t} + u_i + u_t + \varepsilon_{i,t}$$

Where i denotes country and t denotes year. *Innovation* is the dependent variable and is measured alternately as granted patents, patent filings, registered trademarks, and trademark applications. All continuous variables enter the regression in natural logarithms. *RadRightGov* captures radical-right government participation and is described in detail in Section 3.2.2. The one-year lagged dependent variable is included to account for persistence in innovation**.** $X_{i,t}$ is a vector of eight control variables following Wang et al. (2019): R&D expenditure as a share of GDP, manufacturing share of GDP, labour force size, population, FDI inflows as a share of GDP, GDP per capita, the number of scientific articles published, and education. Finally**,** u_i and u_t represent country and year fixed effects, while $\varepsilon_{i,t}$ is the idiosyncratic error term. Standard errors are clustered at the country level to account for serial correlation within countries over time, following Wang et al. (2019).

Before estimating the full model, we test for multicollinearity among the control variables using variance inflation factors (VIF). All controls have VIF values below 10, the conventional threshold above which multicollinearity is considered problematic (Wooldridge, 2015). The control variables are therefore retained in the baseline specification. The full VIF results are reported in Appendix Table A1.

3.2 Variable Definitions

Variable descriptions and expected signs are reported in Appendix Table A3.

3.2.1 Dependent Variables

Patent and trademark data are among the most widely used indicators of innovation, capturing both technological advances and market-oriented activity (Mendonça et al., 2004; Lau and Lo, 2015). These measures provide a consistent basis for comparing innovation across countries and over time. We distinguish between innovation activity and complete output, resulting in four measures.

Patents. A patent represents a novel and useful invention, and patent statistics provide detailed insight into the direction and intensity of innovation activity (Griliches, 1990). Patent filings capture the intermediate output of the innovative process, while longitudinal patent data can be used to study the dynamics of innovation systems over time (Acs et al., 2002). Patents are measured by applicant residence, capturing innovation owned and controlled by firms operating within each country's domestic institutional and regulatory environment (de Rassenfosse et al., 2013). We use harmonised patent filing and grant data from the OECD

database, which compiles information from the European Patent Office and the United States Patent and Trademark Office to provide comparable cross-country patent statistics. Consistent with prior innovation research, we use individual patent filings and assign them to years based on their application date (Bloom et al., 2013; Wang et al., 2019).

Patent data include both applications and grants. While granted patents capture completed innovation output, they reflect decisions made several years earlier, as grants typically lag applications by three to five years (Acs et al., 2002; Rodríguez-Pose et al., 2025). As a result, granted patents reflect earlier institutional and economic conditions, potentially under a different government. Patent filings, by contrast, capture the decision to begin the patenting process and are more closely tied to current conditions. They may therefore respond more quickly to elections and changes in government (Rodríguez-Pose et al., 2025). Applications reflect more immediate changes in innovation activity, while granted patents adjust more gradually over time. We therefore distinguish between patent filings and grants and examine both measures separately.

Trademarks. Trademark applications can serve as a complementary indicator of innovation activity, particularly for non-technological and service-sector innovation not fully captured by patents (Mendonça et al., 2004). They are especially useful for capturing market-oriented forms of innovation, such as branding and business-model changes, which are often not reflected in patent data (Flikkema et al., 2014). Trademark data have been recorded systematically across countries for decades, making them a reliable and widely used proxy for innovation (Wang et al., 2019). Following the same logic as patents, we distinguish between registered trademarks, which reflect completed outcomes, and trademark applications, which capture the immediate innovation activity. To maintain consistency with the patent measures, trademark variables are also assigned based on applicant residence.

Lagged DV. The inclusion of a lagged dependent variable is motivated by the dynamic nature of innovation processes. Innovation outcomes, such as patents and trademarks, are highly persistent over time. Including the lagged dependent variable allows the model to capture this persistence and reduces bias that would arise if it were omitted (Romer, 1990; Peters, 2009).

3.2.2 Ideology Measure

Our primary ideology measure captures whether a radical-right party holds a seat in the governing cabinet of a given country. We focus on the governing coalition rather than the full parliamentary landscape, as governing parties exercise direct executive power through ministerial portfolios and coalition agreements (Martin and Vanberg, 2005; Sagarzazu and Klüver, 2017).

We construct our measure using *lrgen*, the CHES indicator of a party's overall ideological stance, where 0 indicates the extreme left and 10 the extreme right of the ideological spectrum (Bakker et al., 2015). We use this overall measure rather than a purely economic dimension because our focus is on the radical-right as a broader political phenomenon (Rathgeb and Busemeyer, 2022). Following Rodríguez-Pose et al. (2025), parties with a *lrgen* score of 8 or above are classified as radical-right.

Radical-right is a binary variable equal to one if at least one party in the governing cabinet has a *lrgen* score of 8 or above, and zero otherwise. This 'any-party' approach reflects the fact that coalition partners can influence policy regardless of their relative size within the government. Since radical-right parties may also influence the policy environment through channels beyond government participation, we test alternative measures in the robustness checks.

3.2.3 Control Variables

We include eight control variables, in line with Wang et al. (2019), all transformed into natural logarithms. These variables capture key structural determinants of innovation and help reduce the risk that the estimated association is driven by other country-level factors.

Wang et al. (2019) include a ninth control variable, technical cooperation grants, which measures technology aid received from other countries. We exclude this variable because it has insufficient data coverage in our OECD European sample. Technical cooperation grants are primarily recorded for developing countries receiving foreign technology aid, making the variable largely inapplicable to the 27 advanced economies in our sample.

R&D intensity. Research and development investment is one of the most direct inputs into the innovation process. Countries that devote a larger share of economic output to R&D are likely to generate more knowledge, patentable inventions, and innovative products. We measure

R&D intensity as total R&D expenditure as a share of GDP. Given the established relationship between R&D and patenting, we expect a positive effect on innovation outcomes (Griliches, 1990).

Manufacturing share of GDP. The structure of the economy shapes its innovative capacity, as patterns of technological change vary across sectors and depend on sector-specific knowledge and applications (Pavitt, 1984). Manufacturing-intensive economies are likely to generate stronger demand for process innovation, industrial technologies and patentable inventions (Cohen and Klepper, 1996). We expect a positive association with innovation outcomes.

Labour force. The effect of the labour force on innovation operates through two opposing channels. On the one hand, a larger labour force increases the pool of human capital and facilitates knowledge creation and diffusion, thereby supporting innovation (Romer, 1990). On the other hand, induced innovation theory suggests that an abundant labour supply reduces incentives to develop labour-saving technologies (Acemoglu, 2010), thereby decreasing innovation output. Overall, these opposing channels imply an ambiguous expected effect on innovation outcomes.

Population. Population density influences innovation through agglomeration effects. Higher density increases interactions between individuals, which facilitates knowledge spillovers, the diffusion of ideas, and the combination of existing knowledge into new technologies (Carlino et al., 2007; Kremer, 1993). At the same time, prior research suggests the relationship may be non-linear, with diminishing or negative effects at very high levels of density (Carlino et al., 2007). At very high levels of density, congestion, resource competition, and higher costs can reduce the efficiency of knowledge exchange and hinder innovation (Carlino et al., 2007; Coccia, 2014). Therefore, the expected effect on innovation outcomes is ambiguous.

FDI inflows as a share of GDP. Foreign direct investment brings not only capital, but also access to foreign technological knowledge, managerial practices, and international networks. Through these channels, FDI facilitates the diffusion of knowledge and generates spillovers to domestic firms, which can stimulate innovation (Keller, 2004). However, the effect is not necessarily positive; Girma (2005) argues that productivity benefits from FDI depend on domestic firms' absorptive capacity. We measure FDI as net inflows of foreign direct investment as a share of GDP. The expected effect on innovation outcomes is ambiguous.

GDP per capita. Wealthier countries tend to innovate more, as higher income levels indicate greater financial capacity for research and development (Kogan et al., 2017). Drawing on Arin et al. (2015), we include real GDP per capita to control for a country's overall level of economic development. We expect a positive effect on innovation outcomes.

Scientific articles published. Knowledge is a central driver of technological progress. Scientific publications capture national scientific output and form part of a country's innovative capability, alongside innovative input and technological output (Castellacci and Natera, 2013). Compared with general education indicators, scientific articles have a more direct link to technical knowledge creation. In line with Castellacci and Natera (2013), we therefore use the number of scientific articles as a proxy for national scientific output and expect a positive effect on innovation.

Education. Education expands the supply of skilled workers capable of absorbing and applying new knowledge. In national innovation-system research, tertiary enrolment is used as a human-capital indicator of absorptive capacity, which supports innovation dynamics (Castellacci and Natera, 2013). We therefore expect a positive effect on innovation.

3.3 Data Sources

Party ideology scores come from the Chapel Hill Expert Survey (CHES), a large-scale expert survey in which political scientists specialising in European parties evaluate major parties across several ideological dimensions. We use six survey waves: 1999, 2002, 2006, 2010, 2014, and 2019, with *lrgen* being the key variable. CHES provides continuous expert-based ideology scores across multiple dimensions and is widely used in comparative political science research on European parties (Bakker et al., 2015).

Innovation and control data come from three sources. We source patent data from the OECD Patent Database, which provides granular and harmonised statistics for OECD member countries. Trademark data are sourced from WIPO (2023), the United Nations agency responsible for promoting intellectual property protection. All control variables are drawn from the World Bank's World Development Indicators and EdStats database. These are assembled into an unbalanced panel for 27 OECD European countries from 2000 to 2022.

In addition to our primary CHES-based classification, we draw on a second source for robustness purposes. The PopuList 3.0 (Rooduijn et al., 2024) classifies parties as far-right, far-left, populist, and Eurosceptic, using expert consensus rather than a numerical threshold.

3.4 Sample Construction

Geographic scope. The sample is restricted to European OECD member states. This choice is motivated by prior empirical gaps, theoretical considerations, and data constraints. Wang et al. (2019) show that the effect of government ideology on innovation is stronger in OECD countries than elsewhere, but they do not examine this subsample in detail. This study therefore focuses on the context in which the ideology–innovation relationship is expected to be most relevant. In high-income countries, innovation is largely driven by domestic R&D investment, public education, and capital market conditions, all of which governments can influence through policy (Lau and Lo, 2015). Restricting the sample to OECD members thus provides a suitable setting for examining whether radical-right government participation is associated with innovation outcomes in mature innovation systems (Wang et al., 2019).

We further restrict the sample to European OECD countries to improve institutional comparability and ensure consistency between the empirical setting, theoretical framework, and data used in the analysis. This is important because different political systems allocate executive and legislative power differently, which may produce different mechanisms of political influence (Persson, Roland and Tabellini, 1997). The restriction is also appropriate for studying radical-right presence, as the concept of the radical-right is especially relevant to and extensively developed within the European party-system literature (Mudde, 1999). Moreover, radical populist parties in Europe are often constrained by coalition politics, making their influence more comparable across cases when testing their association with innovation outcomes (Borins, 2018). The sample restriction is further supported by the closest related empirical study, which also focuses on European regions (Rodríguez-Pose et al., 2025). In addition, because CHES provides ideology measures only for European parties, a European sample ensures that party ideology is measured consistently across countries (Bakker et al., 2015).

The panel covers the period from 2000 to 2022. Due to the inclusion of a one-year lagged dependent variable, the regression sample spans 2001 to 2022, yielding a maximum of 22 observations per country. The starting point is determined by the availability of the first CHES wave in 1999, while the end date reflects the most recent innovation data available from the OECD and WIPO. Unless otherwise stated, all results and analyses refer to the regression period 2001–2022.

The initial sample consists of 27 European OECD countries: Austria, Belgium, Czech Republic, Denmark, Estonia, Finland, France, Germany, Greece, Hungary, Iceland, Ireland, Italy, Latvia, Lithuania, Luxembourg, Netherlands, Norway, Poland, Portugal, Slovakia, Slovenia, Spain, Sweden, Switzerland, Turkey, and the United Kingdom.

To construct the dataset, CHES ideology scores are merged with ParlGov cabinet records, which requires matching party abbreviations across sources. After harmonising party names using country-specific correction dictionaries, the match rate reaches 77.8 percent. The remaining unmatched observations (22.2 percent) are concentrated in Iceland, Luxembourg, and Switzerland, and mainly involve small regional parties for which CHES does not provide ideology scores. Dropping these three countries does not affect the results (untabulated), so they are retained in the sample, while country-years with missing ideology data are excluded from the regression.

After merging all data sources, applying log transformations, and constructing one-year lags, the final regression sample consists of 27 countries over the period 2001–2022.

Since CHES is conducted every four to five years, ideology scores are only observed in survey-wave years. We therefore carry each party's score forward until the next available wave (see Table A2 in the Appendix), based on the assumption that party ideology remains institutionally stable between survey rounds. This assumption is consistent with the existing literature, which treats party ideology as a long-run organisational characteristic rather than a variable that shifts with short-term economic conditions (Hibbs, 1977).

After this forward-fill procedure, ideology coverage is 505 country-years. Of these, 85 country-years, corresponding to 16.8 percent, are classified as radical-right government years under *Radical-right.* These 85 radical-right government years are distributed across 14 countries: Austria, Greece, Ireland, Italy, Latvia, Lithuania, Netherlands, Norway, Poland, Portugal, Slovakia, Slovenia, Switzerland, and Turkey.

Table 1
Descriptive Statistics.

Variable	N	Mean	Median	SD	Min	Max
Dependent variables						
Patents granted	*621*	*2,639*	*449*	*5,502*	*0*	*38,084*
Patents filed	*594*	*4,231*	*967*	*8,125*	*0*	*46,242*
Registered trademarks	*530*	*26,822*	*9,705*	*38,245*	*334*	*172,000*
Trademark applications	*564*	*33,234*	*10,931*	*45,998*	*427*	*216,587*
Ideology variables						
Radical-right	*505*	*0.168*	*0.000*	*0.374*	*0.000*	*1.000*
Control variables						
R&D intensity (%)	*595*	*1.715*	*1.558*	*0.846*	*0.359*	*3.874*
Industrial share (%)	*621*	*14.814*	*14.712*	*4.906*	*3.912*	*37.098*
Labour force (thousands)	*621*	*9,719*	*4,608*	*11,663*	*168*	*43,982*
Population (people/km²)	*621*	*130.7*	*110.4*	*109.6*	*2.8*	*525.7*
FDI (%)	*619*	*5.203*	*3.085*	*22.802*	*-391.555*	*234.311*
GDP per capita (USD)	*621*	*36,540*	*35,619*	*23,744*	*5,907*	*112,418*
Scientific articles	*621*	*22,274*	*11,775*	*27,635*	*65*	*119,604*
Education (%)	*613*	*109.9*	*106.0*	*15.4*	*74.6*	*164.1*

Notes: All variables are shown in original untransformed units and enter the regression in natural logarithms. Patents and trademarks are total counts by applicant residence. R&D intensity, Industrial share, and FDI are expressed as a percentage of GDP. Labour force is expressed in thousands of workers. Population is measured as people per square kilometre of land area. Scientific articles are the number of scientific and technical journal publications per country-year. Education is the gross tertiary enrolment rate, measured as total enrolment in tertiary education as a percentage of the relevant age population; values may exceed 100. N = number of non-missing country-year observations. SD = standard deviation. Radical-right is a binary indicator (0/1). Regression sample covers 2001–2022; descriptives include 2000.

4. Results

4.1 Data Description

Table 1 reports descriptive statistics for all variables, based on the full panel of country-year observations. The innovation measures display substantial variation across countries and over time. The sample shows that patent filings exceed granted patents on average, potentially reflecting the lag between filing and grant decisions. Patent counts also reach zero in some country-years, whereas trademark measures remain strictly positive throughout, possibly reflecting their broader applicability across economic sectors.

Radical-right government participation is relatively uncommon within the sample, with a mean of (0.168) and a median of zero. This indicates that most country-years do not include a radical-right party in government during the sample period.

Among the control variables, most show variation across country-years, although FDI displays relatively high dispersion, including negative values, indicating substantial fluctuations in cross-border investment flows. More broadly, the wide ranges observed for several controls suggest notable differences in economic size, structure, and overall economic conditions across countries.

4.2 Main Results

Table 2
Radical-Right Government Participation and Innovation.

Variable	**Patents**		**Trademarks**	
	(1) *Granted*	*(2)* *Filed*	*(3)* *Granted*	*(4)* *Applications*
Lagged dependent variable	0.1420	0.5488***	0.6662***	0.7581***
	(0.1550)	(0.1419)	(0.0742)	(0.0669)
Radical-right	-0.0546	-0.0593**	-0.0276	-0.0411*
	(0.0804)	(0.0265)	(0.0304)	(0.0228)
R&D intensity	0.2263	0.3664***	-0.0110	-0.0110
	(0.2056)	(0.1006)	(0.0386)	(0.0258)
Industrial share	0.2374	0.1582	-0.0930	-0.0743
	(0.2248)	(0.1353)	(0.0812)	(0.0583)
Labour force	0.3116	0.1546	-0.1716	-0.0486
	(0.3993)	(0.2070)	(0.1478)	(0.0900)
Population	-2.1015	-0.2167	0.7241	0.4624
	(1.9401)	(0.8124)	(0.8082)	(0.5178)
FDI	0.0015	0.0060**	0.0042	0.0037
	(0.0039)	(0.0029)	(0.0030)	(0.0026)
GDP per capita	2.3784*	1.1977***	0.3227	0.0946
	(1.3604)	(0.4132)	(0.3503)	(0.2136)
Scientific articles	0.8161***	0.4053***	0.0144	-0.0145
	(0.2421)	(0.1199)	(0.0932)	(0.0620)
Education	0.3601	0.3855	0.1140	0.0482
	(0.3527)	(0.2510)	(0.1386)	(0.0998)
Country fixed effects	Yes	Yes	Yes	Yes
Year fixed effects	Yes	Yes	Yes	Yes
N	485	460	403	429
R^2	0.327	0.563	0.520	0.651

Notes: Standard errors in parentheses, clustered at the country level. Radical-right = 1 if any governing party is classified radical-right. Differences in N across columns reflect data availability for each dependent variable. Country and year fixed effects included throughout. All continuous variables in natural logarithms. *** p<0.01 ** p<0.05 * p<0.10.

Table 2 presents the main regression results for all four innovation outcomes. The coefficient on *Radical-right* is negative across all specifications, consistent with the hypothesis that

radical-right government participation is associated with lower innovation. However, both the magnitude and statistical significance of the coefficients vary across innovation outcomes.

For the two activity measures, which capture active innovation decisions rather than completed outputs, the negative effect reaches conventional levels of statistical significance. Patents filed show a coefficient of (−0.0593), significant at the 5% level, while trademark applications show a coefficient of (−0.0411), significant at the 10% level. This implies that, on average within our sample, patent filings are approximately 5.9% lower and trademark applications 4.1% lower in country-years with radical-right government participation compared to those without. For the two output measures, patents and registered trademarks, the coefficients are also negative but are not statistical significance. These results could be consistent with the earlier argument that grants adjust more slowly to changes in government than applications.

The lagged dependent variable is positive and statistically significant for three of the four outcomes, suggesting that innovation exhibits persistence over time, consistent with the earlier notion of path dependence. Among the control variables, R&D intensity, FDI, GDP per capita, and scientific output show statistically significant associations in some specifications, particularly for patent-related outcomes. The remaining controls are not statistically significant.

4.3 Robustness Checks

We conduct several robustness checks to assess whether our findings are sensitive to the classification method, threshold choice, sample composition, or the presence of influential observations. In addition, we examine potential channels through which ideology may affect innovation, drawing on insights from the existing literature. All referenced tables are reported in the Appendix.

4.3.1 Alternative Measures of Radical-Right Influence

We construct two additional measures of radical-right government participation, each capturing a distinct dimension of how such parties may influence the governing environment.

Seatshare is a continuous measure of the legislative weight held by radical-right parties within the governing coalition. It captures not only whether radical-right parties are present, but also their relative strength within government. *Entry* is an entry-shock indicator equal to

one in the first year a radical-right party enters a governing coalition that previously had no radical-right participation, and zero in all other years. This tests whether the initial entry of a radical-right party into government is associated with a disruption or signalling effect on innovation activity, separate from its ongoing presence.

The main results in Table R1 are directionally consistent with the main analysis. Radical-right *seatshare* is negatively associated with all four innovation indicators, although the magnitude of the effect varies across outcomes. For patents filed, the coefficient of (−0.3285) is statistically significant at the 10% level and indicates a strong negative association between radical-right seat share and patent filings. Trademark applications also show a statistically significant negative association at the 5% level, with a coefficient of (−0.2304). Both patents granted and registered trademarks are statistically insignificant, so no firm conclusions can be drawn from these estimates. Overall, the results suggest that the negative association with innovation is not merely related to radical-right presence in government, but becomes more pronounced as these parties hold a larger share of executive power.

Compared with *seatshare*, the *entry* measure shows a weaker association with innovation. As shown in Table R1. None of the four *entry* coefficients reaches statistical significance, meaning that the results do not provide clear evidence of a distinct entry-shock effect. The coefficient for patents granted is marginally positive, which stands out from the negative coefficients for the other outcomes, but it is statistically insignificant and should not be interpreted as evidence of a positive association. Overall, the entry results suggest only a tentative negative pattern and do not support that the first year of radical-right entry produces an immediate signalling effect on innovation. This may be because entry shocks are rare, which limits the statistical power of the regression.

4.3.2 Alternative Party Classification

Table R2 replaces the CHES-based classification with PopuList 3.0 (Rooduijn et al., 2024), an independently constructed expert-based classification of far-right parties linked to the cabinet data through ParlGov party identifiers. This robustness check is important because PopuList includes some parties that are not classified as radical-right under the CHES-based definition. For example, Hungary's Fidesz is classified as radical-right in PopuList, but not under the CHES-based measure. The coefficients are negative across all four outcomes,

maintaining directional consistency with the main analysis. However, statistical significance for patent filings weakens

The results in Table R2 show that the coefficients for patents granted and patents filed are negative but statistically insignificant. Therefore, although they move in the expected direction, no firm conclusions can be drawn from the patent results. In contrast, the trademark outcomes show statistically significant negative associations. When radical-right parties are present in the governing coalition, registered trademarks decrease by approximately 5.9%, with a coefficient of (-0.0603) significant at the 5% level. Similarly, trademark applications decrease by approximately 3.8%, with a coefficient of (-0.0383) significant at the 10% level.

Compared with the main findings in Table 3, this alternative classification produces a somewhat different pattern. Under the PopuList 3.0 classification, statistically significant negative coefficients are found only for trademark outcomes, while patents filed is no longer statistically significant. However, the direction of the estimates remains consistent, as all radical-right coefficients are negative across the four outcomes. This indicates that the results are somewhat sensitive to the classification of radical-right parties, with the strongest evidence appearing for trademark outcomes.

4.3.3 Threshold Sensitivity

Table R3 tests whether the main results are sensitive to the threshold used to classify radical-right parties based on the *lrgen* ideology scale. The baseline specification is re-estimated using *lrgen* ≥ 7.5, which includes parties closer to the mainstream right, and *lrgen* ≥ 8.5, which applies a stricter classification criterion. The *lrgen* ≥ 8.0 row corresponds to the main *Radical-right* measure and is therefore identical to Table 3.

Lowering the threshold to *lrgen* ≥ 7.5 increases the number of radical-right government-years from 85 to 185 and is associated with weaker statistical significance for trademark applications. Raising the threshold to *lrgen* ≥ 8.5 reduces the number of radical-right government-years to 48, with most coefficients remaining negative but generally not statistically significant. Across all three thresholds, the direction of the coefficients is largely stable.

Patent filings remain negative and statistically significant across all thresholds, while trademark applications are sensitive to the choice of cut-off. Other outcomes are generally not

statistically significant, and at lrgen ≥ 8.5 the coefficient for granted patents becomes positive but remains imprecisely estimated.

4.3.4 Influential Country Checks

Table R4 examines whether the main results are driven by countries with high exposure to radical-right government participation. We sequentially exclude Latvia, Italy, and Slovakia, the three countries with the highest number of radical-right government-years, and then remove all three simultaneously.

Across all specifications, coefficients remain negative, indicating that the results are not driven by any single country. Dropping Italy yields an interesting result: the coefficient on patent filings becomes more negative (from −0.0593 to −0.0692), and trademark grants, which are insignificant in the baseline, become statistically significant (-0.0466), while trademark applications remain significant. In practical terms, this means that the negative association becomes stronger when Italy is excluded, indicating that Italy's experience moderates the overall effect in the full sample.

When all three countries are excluded simultaneously, coefficients remain negative across all outcomes but lose statistical significance, which may reflect the reduced number of radical-right observations and limited variation for estimation.

4.3.5 Correlated Random Effects

Table R5 examines whether the association between radical-right government participation and innovation is present across countries, rather than only within countries over time. The coefficients are negative across all four outcomes: patents granted (−0.072), patents filed (−0.036), registered trademarks (−0.024), and trademark applications (−0.016), but none are statistically significant. The direction is consistent with the main results, although less precisely estimated. Overall, this suggests that the negative association is primarily driven by within-country variation, while the cross-country evidence is weaker.

4.3.6 Economic and Cultural Mechanisms

This robustness check examines whether the negative association between radical-right government participation and innovation is driven by economic or cultural-authoritarian

aspects of ideology. To assess this, we use two CHES indicators: galtan, capturing cultural-authoritarian positions, and lrecon, capturing economic positions.

Table R6 shows that the cultural dimension produces a negative coefficient across all outcomes. Patent filings (−0.0227) is statistically significant at the 5% level, while the remaining coefficients are not statistically significant. By contrast, the economic dimension yields coefficients that are small and close to zero across all outcomes, ranging from (−0.0023) to (0.0117), and none are statistically significant.

Taken together, these results suggest that the association may be more closely related to the cultural-authoritarian dimension than to economic positioning, although the evidence is limited and not consistently statistically significant.

4.3.7 Parliamentary Seat Share

Table R7 tests whether radical-right influence extends beyond the governing coalition to the broader parliamentary context, consistent with the idea that parties may shape policy through agenda-setting even from opposition. We use the share of parliamentary seats held by radical-right parties as the key measure.

The results show negative coefficients across all four outcomes. Trademark applications (−0.1513) and registered trademarks (−0.2052) are statistically significant at the 10% level.

Overall, the results suggest that the negative association may extend beyond cabinet participation to parliamentary presence, However, statistical significance appears only for trademark outcomes; the patent coefficients are statistically insignificant.

5. Discussion

5.1 The Main Findings

The central question of this thesis is whether radical-right government participation is associated with lower innovation in European OECD countries. The results suggest a negative relationship, but mainly for innovation activity rather than completed outcomes. This indicates that radical-right participation may be related to the decision to initiate innovation, while we find no significant support for completed innovation outcomes.

This interpretation should be treated with caution. As established in the literature, radical-right parties are most likely to influence outcomes when they can translate their ideology into policy through positions of political power (Martin and Vanberg, 2005; Sagarzazu and Klüver, 2017). However, the link between government ideology and innovation is not straightforward. Innovation is shaped by a wide range of policies and institutions that interact over time (Flanagan et al., 2011). Current outcomes often reflect past decisions and accumulated conditions, not only the actions of the current government (Onufrey and Bergek, 2015). As a result, changes in government may not translate immediately into observable innovation outcomes.

These factors also raise concerns about reverse causality. It is possible that weaker innovation performance or broader economic challenges increase support for radical-right parties, rather than radical-right participation directly reducing innovation. This aligns with literature linking support for such parties to economic insecurity and structural change (Kriesi et al., 2006). For this reason, the results should be interpreted as associations rather than causal effects.

Despite these limitations, the findings remain broadly consistent with the theoretical framework and the robustness checks. The stronger association for innovation activity compared to completed outcomes suggests that political and institutional conditions are more closely linked to early-stage innovation decisions (Rodríguez-Pose et al., 2025). This can be understood in light of the multi-stage nature of innovation. Patent activity involves time lags between application and grant (Acs et al., 2002). Later outcomes may therefore reflect earlier policy environments and institutional conditions (Onufrey and Bergek, 2015).

This pattern is also consistent with the literature emphasising the role of openness, knowledge spillovers, and human capital in innovation (Aghion et al., 2015; Coe and Helpman, 1995;

Hunt and Gauthier-Loiselle, 2010). Restrictions on knowledge flows and skilled labour may reduce firms' incentives to initiate innovation**,** although this cannot be directly tested here**.** The literature suggests that parliamentary presence can matter, particularly through agenda-setting and political pressure outside government. However, our parliamentary seat share robustness check provides only weak evidence that the association extends beyond government participation, as statistical significance is limited to trademark outcomes. This suggests that broader parliamentary presence may matter through agenda-setting and expectations, but the evidence is not strong enough to draw firm conclusions about a general parliamentary effect.

An important implication is that the observed effects likely reflect short-term responses. Many of the mechanisms discussed in the literature, such as human capital formation and knowledge accumulation, operate over longer time horizons. This suggests that the results may understate the full impact of political ideology on innovation.

At the same time, the findings point to a distinction between different types of policy influence. Short-term innovation outcomes are often linked to economic policy instruments such as R&D subsidies and tax incentives (Bloom et al., 2019). However, the negative association observed here is less consistent with these channels. Instead, it may reflect broader cultural and institutional dynamics that shape the environment in which firms make innovation decisions.

Taken together, the results suggest that the relationship between radical-right politics and innovation is not driven by a single mechanism. It likely reflects a combination of policy influence, institutional persistence, and changes in the broader political and economic environment. In this sense, political ideology may affect innovation not only through formal policy decisions, but also through expectations about openness, stability, and the direction of the broader political climate.

5.2 Additional Findings

Building on the main finding, several additional patterns emerge that help clarify how radical-right politics may shape innovation. One important aspect is that the effect appears stronger when radical-right parties hold greater political influence, rather than reflecting participation alone. The negative association becomes more pronounced when these parties hold a larger share of executive power, which is consistent with the literature showing that policy outcomes

in coalition governments depend on the distribution of ministerial control and bargaining power (Martin and Vanberg, 2005; Sagarzazu and Klüver, 2017). This suggests that the relationship may depend on the degree of political influence rather than participation alone.

At the same time, the absence of a clear entry effect indicates that this relationship does not appear to arise as an immediate response to political change. Instead, it is more consistent with the view that innovation evolves within a broader policy environment that adjusts gradually over time (Flanagan et al., 2011; Onufrey and Bergek, 2015). Firms may therefore respond less to discrete political events and more to the accumulation of signals about policy direction, institutional stability, and future openness. In this sense, the effect of radical-right participation may reflect a shift in expectations and constraints rather than a one-off disruption.

The distinction between cultural and economic ideology provides further, although limited, insight into potential mechanisms. The finding that the cultural-authoritarian dimension is associated with lower patent filings, while the economic dimension is not, is consistent with the literature emphasising that radical-right parties are primarily defined by cultural rather than economic positions (Rathgeb and Busemeyer, 2022). It also aligns with the hypothesis that their effects are more likely to operate through cultural and institutional channels than through standard economic policy. However, since this pattern is not consistently observed across all outcomes, it should be interpreted with caution. Rather than identifying a definitive mechanism, the results suggest that cultural factors may play a role, but the evidence remains indicative rather than conclusive.

Finally, the results also point to the possibility that political influence extends beyond the formal exercise of executive power. While influence within government appears to depend on the strength of executive participation, the parliamentary results suggest that radical-right parties may also shape the innovation environment through indirect channels outside the cabinet. Their broader presence in parliament is associated with negative patterns in innovation outcomes, particularly for trademarks, which is consistent with the literature on agenda-setting and political influence beyond formal office (Seeberg, 2013; Akkerman, 2012), as discussed earlier in Section 2.4. This points to the possibility that the political climate itself, through shifts in policy attention, expectations, and discourse, may influence firms' willingness to engage in innovation. However, as these results are less robust, this interpretation should be treated with caution.

Taken together, these findings suggest that radical-right parties may influence innovation through both direct channels of executive power and indirect channels related to agenda-setting and the broader political environment.

6. Conclusion

6.1 Summary

This study asks whether the political presence of radical-right parties in government coincides with weaker national innovation performance. To examine this, we construct a country-year dataset for 27 European OECD countries over 2001–2022, linking government participation data to Chapel Hill Expert Survey party ideology scores. We then compare changes in patent filings, granted patents, trademark applications, and registered trademarks across years with and without radical-right government participation. The empirical analysis relies on panel OLS regressions with country and year fixed effects, alongside controls for structural differences in countries' innovation systems.

The findings provide partial support for the hypothesis. Radical-right government participation is negatively associated with all four innovation measures, but the relationship is statistically significant only for patent filings and trademark applications. The coefficient is (−0.0593) for patent filings, significant at the 5% level, and (−0.0411) for trademark applications, significant at the 10% level. Since the dependent variables are logged, this corresponds to approximately 5.9% fewer patent filings and 4.1% fewer trademark applications during years with radical-right government participation. The coefficients for granted patents and registered trademarks are also negative, at (−0.0546) and (−0.0276), respectively, but statistically insignificant. This suggests that radical-right government participation is more clearly related to fewer new patent and trademark submissions than to changes in granted or registered outcomes.

The robustness checks broadly support this interpretation, as the negative direction is largely preserved across alternative classifications and influential-country checks. However, significance weakens in some specifications, meaning that the results should be interpreted with caution. Since panel OLS cannot fully address endogeneity, the findings should be understood as associations rather than causal effects.

Nevertheless, the findings are consistent with prior literature linking radical-right politics to weaker innovation outcomes. A possible explanation is that radical-right parties may reduce firms' and researchers' willingness and capacity to innovate. Restrictive immigration preferences can reduce access to skilled talent, scepticism toward expertise may undermine

trust in science, and nationalist policies may limit international collaboration and knowledge flows. While our main measure captures the broader ideological orientation of radical-right parties, the robustness tests suggest that the cultural-authoritarian channel could be more relevant than the economic channel. These mechanisms provide a plausible explanation for why radical-right government participation is associated with fewer patent filings and trademark applications. By contrast, the lack of significant results for granted patents and registered trademarks may reflect timing, as these outcomes often depend on application decisions made in earlier political environments. To the best of our knowledge, this thesis is the first to examine radical-right government participation and innovation in a European OECD setting. It therefore contributes to the literature by moving beyond electoral support for radical-right parties and focusing on periods in which these parties participate in governing coalitions and may influence the policy environment more directly and its effect on innovation.

6.2 Limitations

Given the complexity of the research question, we have identified several limitations that will be addressed in this section.

First, although our fixed-effects panel OLS model controls for stable country characteristics and common year shocks, it cannot fully rule out endogeneity. The main concerns are omitted-variable bias and reverse causality. Omitted-variable bias may arise if time-varying political or economic conditions affect both radical-right government participation and innovation. Reverse causality may arise if weak innovation performance increases economic dissatisfaction and, as a result, makes radical-right government participation more likely.

Second, we cannot observe whether radical-right parties translate their ideology into meaningful policy once in government. The model captures government participation, but not whether parties behave as promised before entering office or whether their positions lead to concrete policy changes. As discussed in the literature, radical-right parties may also affect innovation through their presence in government, but our analysis assumes these theoretical channels rather than directly testing policy implementation. Although the lagged dependent variable accounts for persistence in innovation over time, it does not identify when, or through which policy channel, ideology affects innovation. This matters because different

policies may take different amounts of time to negotiate, implement, and influence innovation.

Third, the mechanism analysis is necessarily limited. We distinguish mainly between economic ideology and cultural-authoritarian ideology, which helps assess whether the relationship is more closely linked to conventional economic policy or to the broader cultural profile of radical-right parties. However, this does not capture all possible mechanisms, such as changes in skilled migration, scientific trust, university autonomy, EU research cooperation, or direct R&D support. The analysis therefore provides suggestive evidence about channels, but not a complete explanation of how radical-right participation may affect innovation.

Fourth, the sample limits both generalisability and statistical power. The study focuses on 27 European OECD countries, which provides a theoretically relevant and comparable setting, but it is not a random global sample. Radical-right government participation is also concentrated in a limited number of countries and years, making the estimates sensitive to specific national cases. Nevertheless, this sample allows the study to examine the ideology–innovation relationship in the context where radical-right parties are most clearly defined and where comparable party-ideology data are available and homogeneous characteristics.

Fifth, the classification of radical-right parties is subject to inherent uncertainty. Although this study relies on the CHES lrgen measure and complements it with an alternative classification using PopuList 3.0, borderline cases remain unavoidable. For example, Hungary's Fidesz receives an lrgen score of approximately 7.8 in the 2019 CHES wave, placing it close to the chosen cut-off of 8.0, while it is classified as far-right in PopuList. Such cases illustrate that small changes in classification thresholds or coding decisions can affect which country-years are treated as radical-right. While the robustness checks suggest that the overall direction of the results is stable, the classification of specific parties remains somewhat sensitive and may introduce measurement uncertainty.

6.3 Future Research

Future research can address several limitations of this study. First, the mechanisms linking radical-right government participation to innovation could be examined more directly. While this thesis captures the overall effect and provides suggestive evidence that the cultural-

authoritarian dimension matters, radical-right parties are defined by multiple ideological components, including nativism, authoritarianism, and populism. Separating these dimensions more clearly could help identify which channels are most relevant for innovation. In addition, future research could examine whether similar effects arise for radical-left parties. This would help determine whether the observed relationship is specific to radical-right ideology or reflects broader effects of ideological extremity and political polarisation.

Second, extending the analysis beyond European OECD countries would increase the number of radical-right government observations and improve statistical power. A broader sample would also introduce greater variation in both ideology and innovation outcomes. It would further allow future research to examine whether the relationship differs across levels of economic development. The direction of this relationship is ambiguous. In more advanced economies, stronger institutions may amplify the impact of political changes through more consistent policy implementation. At the same time, in less developed contexts, where institutions are less stable, political shifts may have more immediate but less predictable effects on innovation outcomes.

Finally, the analysis could be extended to the firm- and investor-level. If radical-right participation alters the innovation environment, firms may adjust their R&D investment, patenting behaviour, or financing decisions. Examining firm-level responses would help determine whether the country-level associations identified here translate into changes in corporate behaviour. Similarly, analysing investor reactions could provide insight into whether shifts in government ideology are reflected in firm valuations, stock returns, or expectations**.**

7. Appendix

Table A1

Variance Inflation Factors for Control Variables.

Variable	VIF	Verdict
R&D intensity	2.052	**Pass**
Industrial share	1.362	**Pass**
Labour force	4.789	**Pass**
Population	4.211	**Pass**
FDI	1.047	**Pass**
GDP per capita	3.320	**Pass**
Scientific articles	3.647	**Pass**
Education	1.382	**Pass**
Maximum VIF	*4.789*	**Pass**

Notes: Variance inflation factors are computed on country-demeaned data to simulate the within estimator used in the fixed effects regression, following the procedure in Wooldridge (2015). All regressors including the ideology indicator and lagged dependent variable are included in the VIF matrix. Controls are selected iteratively: the variable with the highest VIF is dropped each round until all remaining controls have VIF below 10, the conventional threshold above which multicollinearity is considered problematic. The highest VIF in the final control set is 4.789 (Labour force), which is below the threshold. All eight controls are therefore retained in the baseline specification.

Table A2

CHES Survey Waves and Forward-Fill Assignment.

CHES wave	Applied to years	Regression years	Parties surveyed
1999	1999–2001	2001	142
2002	2002–2005	2002–2005	171
2006	2006–2009	2006–2009	188
2010	2010–2013	2010–2013	239
2014	2014–2018	2014–2018	268
2019	2019–2022	2019–2022	277
Total	2001–2022	22	1,285

Notes: CHES is conducted approximately every four to five years. Each party's ideology score is carried forward from its survey wave year until the next available wave, on the assumption that party ideology is institutionally stable between survey rounds (Hibbs, 1977; Bakker et al., 2015). The 1999 wave covers 1999–2001 in the raw data but the regression sample begins in 2001. Parties surveyed refers to the total number of parties in each wave across all countries; the count increases as CHES expanded coverage following EU enlargement. Total parties (1,285) count party-wave observations, not unique parties.

Table A3
Variable Descriptions and Expected Signs.

Variable	Description	Source	Expected sign
Dependent			
Patents granted	Number of patents granted per country-year (completed output)	OECD	
Patents filed	Number of filings filed per country-year (activity measure)	OECD	
Registered trademarks	Number of trademarks registered per country-year (completed output)	WIPO	
Trademark applications	Number of trademark applications filed per country-year (activity measure)	WIPO	
Ideology			
Radical-right	Binary: 1 if any governing party has lrgen ≥ 8	CHES	-
Control			
R&D intensity	R&D expenditure as a share of GDP	WDI	+
Industrial share	Manufacturing value added as a share of GDP	WDI	+
Labour force	Total labour force	WDI	±
Population	Population per sq. km	WDI	±
FDI	Net FDI inflows as a share of GDP	WDI	±
GDP per capita	Real GDP per capita in constant USD	WDI	+
Scientific articles	Number of scientific and technical journal articles published	WDI	+
Education	Tertiary school enrolment rate	WDI	+

Notes**:** This table reports the variables used in the regression analysis, their definitions, data sources, and expected signs. The dependent variables are patents granted, patents filed, registered trademarks, and trademark applications. A (**+**) indicates an expected positive association with the dependent variables, a (**−**) indicates an expected negative association, and (**±**) indicates that the expected association is theoretically ambiguous. Blank cells in the expected-sign are assigned to the dependent variables, for which no expected sign is reported, as expected signs refer to the anticipated direction of association between each explanatory variable and the dependent variables.

"Completed output" refers to granted patents or trademarks, capturing realised innovation or trademark outcomes. "Activity measure" refers to filed applications, capturing ongoing innovation or trademarking activity. The radical-right variable is based on the CHES *lrgen* score, with parties scoring ≥ 8 classified as radical-right. CHES = Chapel Hill Expert Survey. ParlGov = Parliamentary Governments Database. OECD = OECD Patent Database. WIPO = World Intellectual Property Organization. WDI = World Bank World Development Indicators.

Table R1

Alternative Ideology Measures.

Measure	Patents		Trademarks	
	(1) Granted	*(2) Filed*	*(3) Granted*	*(4) Applications*
Seatshare	-0.4858	-0.3285*	-0.2796	-0.2304**
	(0.4428)	(0.1872)	(0.2271)	(0.1154)
Entry	0.0075	-0.0578	-0.0429	-0.0299
	(0.0698)	(0.0321)	(0.0384)	(0.0189)
R^2	0.327	0.534	0.554	0.664

Notes: Standard errors are reported in parentheses and are clustered at the country level and account for within-country correlation over time. The table covers the period 2001–2022. The dependent variables are log-transformed. The table compares two alternative explanatory variables for radical-right participation in government. *Seatshare* is the seat share-weighted proportion of radical-right participation in coalitions, and, by implication, their relative influence over cabinet positions. *Entry* is a binary indicator equal to 1 in the first year a radical-right party enters government or re-enters after an absence, 0 otherwise, capturing the effect of a change in coalition composition. All specifications include the same control variables, country fixed effects, year fixed effects, and lagged dependent variables. Because *Seatshare* is continuous and *Entry* is binary, the coefficients are not directly comparable in magnitude. *** p<0.01 ** p<0.05 * p<0.10.

Table R2

Alternative Classification - PopuList 3.0.

Measure	Patents		Trademarks	
	(1) Granted	*(2) Filed*	*(3) Granted*	*(4) Applications*
Radical-right (PopuList)	-0.3314	-0.0513	-0.0603**	-0.0383*
	(0.2847)	(0.0520)	(0.0303)	(0.0215)
Control variables	Yes	Yes	Yes	Yes
Country fixed effects	Yes	Yes	Yes	Yes
Year fixed effects	Yes	Yes	Yes	Yes
N	547	522	455	490
R^2	0.342	0.540	0.557	0.667

Notes: Standard errors are reported in parentheses and are clustered at the country level to account for within-country correlation over time. The table covers the period 2001–2022. All dependent variables are log-transformed. Radical-right (PopuList**)** equals 1 when at least one governing party is classified as far-right by PopuList 3.0 and 0 otherwise. The PopuList classification comes from Rooduijn et al. (2024) and is linked to governing-party data from ParlGov using shared party identifiers. The measure uses PopuList's non-borderline far-right classification, based on the variables *far-right_startnobl* and *far-right_endnobl* (PopuList)**,** meaning that only parties clearly classified as far-right during the relevant period are coded as radical-right. All specifications include a lagged dependent variable, eight control variables, country fixed effects, and year fixed effects. Differences in the number of observations across columns reflect differences in data availability across the outcome measures. *** p<0.01 ** p<0.05 * p<0.10.

Table R3

Threshold Sensitivity - *lrgen* Cut-offs at 7.5, 8.0, and 8.5.

Threshold	**Patents**		**Trademarks**	
	(1) Pat. Granted	*(2) Pat. Filed*	*(3) TM Granted*	*(4) TM Applied*
lrgen 7.5 (N_RR=185)	-0.0681	-0.0579**	-0.0110	-0.0082
	(0.0813)	(0.0249)	(0.0191)	(0.0138)
lrgen 8.0 (N_RR=85)	-0.0546	-0.0593**	-0.0276	-0.0411*
	(0.0804)	(0.0265)	(0.0304)	(0.0228)
lrgen 8.5 (N_RR=48)	0.0270	-0.0881**	-0.0099	-0.0181
	(0.0834)	(0.0352)	(0.0554)	(0.0269)
R^2	0.327	0.563	0.520	0.651

Notes: Each row re-defines radical-right government using a different *lrgen* threshold applied to any governing party. The *lrgen* ≥ 8.0 row uses government participation directly from the main panel and is identical to Table 2 by construction. N_RR = radical-right government-years. R^2 reported for the baseline (*lrgen* ≥ 8.0) for the full sample. *** p<0.01 ** p<0.05 * p<0.10.

Table R4

Country Drop Checks.

Sample restriction	**Patents**		**Trademarks**	
	(1) Pat. Granted	*(2) Pat. Filed*	*(3) TM Granted*	*(4) TM Applied*
Full sample (baseline)	-0.0546	-0.0593**	-0.0276	-0.0411*
	(0.0804)	(0.0265)	(0.0304)	(0.0228)
Drop Latvia (17 RR yrs, 73.9%)	-0.0536	-0.0393**	-0.0293	-0.0410*
	(0.0513)	(0.0167)	(0.0320)	(0.0248)
Drop Italy (12 RR yrs, 52.2%)	-0.0658	-0.0692**	-0.0466*	-0.0488**
	(0.0902)	(0.0272)	(0.0280)	(0.0240)
Drop Slovakia (8 RR yrs, 34.8%)	-0.0576	-0.0675**	-0.0248	-0.0341
	(0.0835)	(0.0313)	(0.0386)	(0.0266)
Drop Latvia, Italy, and Slovakia	-0.0328	-0.0333	-0.0483	-0.0387
	(0.0538)	(0.0203)	(0.0424)	(0.0317)
R^2	0.242	0.430	0.240	0.423

Notes: Latvia, Italy, and Slovakia are selected as the countries with the highest number of radical-right government-years and consistent data coverage. Switzerland, despite having 12 radical-right government-years, is excluded as its classification derives largely from forward-filled CHES data with sparse observation coverage. RR yrs denotes years with at least one radical-right cabinet party. Percentage = share of observed years classified as radical-right. Only the Radical-right coefficient is shown. Standard errors clustered at the country level. *** p<0.01 ** p<0.05 * p<0.10.

Table R5
Correlated Random Effects.

Variable	Patents		Trademarks	
	(1) Granted	*(2) Filed*	*(3) Granted*	*(4) Applications*
Radical-right	*-0.0718*	*-0.0358*	*-0.0241*	*-0.0157*
	(0.0838)	(0.0238)	(0.0213)	(0.0167)
Country means included	Yes	Yes	Yes	Yes
Country fixed effects	No	No	No	No
Year fixed effects	Yes	Yes	Yes	Yes
N	485	460	403	429
R^2	0.968	0.813	0.918	0.834

Notes: Country fixed effects are replaced by the country mean of each continuous regressor (lagged dependent variable and all eight controls), included as additional regressors. This separates within-country from between-country variation and allows cross-sectional identification while controlling for stable country-level differences. Year fixed effects are retained throughout. The high R^2 likely reflects persistence and country-level averages rather than the explanatory power of the main variable. Standard errors are clustered at the country level. *** p<0.01 ** p<0.05 * p<0.10.

Table R6
Ideology Dimensions - Cultural and Economic.

Variable	Patents		Trademarks	
	(1) Granted	*(2) Filed*	*(3) Granted*	*(4) Applications*
Cultural	-0.0289	-0.0227**	-0.0047	-0.0006
	(0.0257)	(0.0092)	(0.0076)	(0.0047)
Control variables	Yes	Yes	Yes	Yes
Country fixed effects	Yes	Yes	Yes	Yes
Year fixed effects	Yes	Yes	Yes	Yes
N	485	460	403	429
R^2	0.331	0.571	0.520	0.647
Economic	0.0117	0.0041	-0.0023	0.0008
	(0.0147)	(0.0087)	(0.0061)	(0.0043)
Control variables	Yes	Yes	Yes	Yes
Country fixed effects	Yes	Yes	Yes	Yes
Year fixed effects	Yes	Yes	Yes	Yes
N	485	460	403	429
R^2	0.327	0.560	0.519	0.647

Notes: Both indicators are binary and constructed using the same logic as the main regression: equal to 1 if any governing party scores ≥ 8 on the respective CHES dimension, 0 otherwise. *Cultural* equals 1 if any governing party scores ≥ 8 on *galtan* (0 = libertarian/progressive, 10 = authoritarian/traditional). *Economic* equals 1 if any

governing party scores ≥ 8 on lrecon (0 = state intervention, 10 = free market). Standard errors are clustered at the country level. *** p<0.01 ** p<0.05 * p<0.10.

Table R7

Parliamentary Seat Share of Radical-Right Parties.

Variable	**Patents**		**Trademarks**	
	(1) Granted	*(2) Filed*	*(3) Granted*	*(4) Applications*
Parliament seat share	-0.8037	-0.2150	-0.2052*	-0.1513*
	(0.7030)	(0.1834)	(0.1062)	(0.0778)
Control variables	Yes	Yes	Yes	Yes
Country fixed effects	Yes	Yes	Yes	Yes
Year fixed effects	Yes	Yes	Yes	Yes
N	522	498	430	465
R^2	0.264	0.481	0.588	0.660

Notes: Parliament seat share is the proportion of total parliamentary seats held by radical-right parties in each country-year. This measure builds on the previous seat share specification in R1 but extends it to the full parliament rather than the governing coalition, capturing the broader parliamentary strength of radical-right parties. Standard errors are clustered at the country level. *** p<0.01 ** p<0.05 * p<0.10.

7.1 AI Usage

This thesis made use of AI tools to support the research process. Claude Opus 4.7 was used to assist with coding and the preparation of regression tables. ChatGPT (SSE Enterprise version) was used for language refinement and to improve the overall structure of the text. All substantive analysis, methodological decisions, and interpretations were developed by the authors, and the final content reflects their own work and judgment.

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