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Entrepreneurship and decent work creation: complementary roles of governance, social expenditure and digitalisation in the European Union

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Abstract

Entrepreneurship is increasingly recognised as a key mechanism for promoting decent work and advancing inclusive economic development. However, the extent to which entrepreneurial activity contributes to decent work independently of broader institutional and socioeconomic conditions remains insufficiently understood. This study examines the relationship between entrepreneurship and decent work across the European Union, while accounting for the influence of governance quality, social expenditure, and digitalisation. Using Partial Least Squares Structural Equation Modelling (PLS-SEM) on data for 21 Member States (2021–2024), the analysis examines whether entrepreneurship remains associated with decent work once social expenditure effort and digitalisation, the pathways through which governance is linked to decent work, are taken into account.

The results indicate that entrepreneurial activity is positively and significantly associated with decent work outcomes, even when social expenditure effort and digitalisation are taken into account. Governance quality is linked to decent work through social expenditure and digitalisation, which are associated with more favourable labour market environments. Nevertheless, entrepreneurship maintains a distinct contribution, suggesting that entrepreneurial ecosystems are associated with employment opportunities that are consistent with the principles of decent work.

These findings contribute to the growing literature on entrepreneurship and decent work by showing that entrepreneurship is not solely a product of supportive institutions but contributes, alongside institutional conditions, to explaining decent work. The study also offers policy implications for the design of integrated strategies that combine entrepreneurship promotion with institutional strengthening, social investment, and digital transformation in order to advance Sustainable Development Goal 8 and foster inclusive and sustainable labour markets in Europe.

JEL Classification: L26; J81; H53; H11; O33; O52

Plain English Summary

European Union countries with more entrepreneurial activity show better decent work outcomes, even after accounting for social spending and digitalisation. Using data for 21 European Union countries between 2021 and 2024, this study shows that well-governed countries tend to achieve better job quality and to invest more in social protection and digital transformation. However, entrepreneurial activity makes its own positive contribution to decent work beyond these institutional factors. The principal implication is that policymakers pursuing Sustainable Development Goal 8 should combine entrepreneurship promotion with institutional strengthening, social investment and digital transformation, rather than treating them as separate policies.

1. Introduction

Decent work has become a central objective of contemporary economic and social policy due to its relevance for individual well-being, social inclusion, and sustainable development (International Labour Organization [ILO], 1999, 2019). Beyond employment creation, the quality of jobs matters because labour market participation does not always guarantee adequate working conditions, income security, or social protection.

Consequently, understanding the determinants of decent work has attracted growing attention among scholars and policymakers seeking to promote more inclusive and sustainable economic development.

The literature has traditionally emphasised the role of institutional quality, public policies, and technological progress in shaping labour market outcomes. Effective governance contributes to creating predictable regulatory environments, strengthening public service delivery, and enhancing the effectiveness of social and economic policies (Kaufmann et al., 2010). Likewise, social expenditure can support decent work by protecting vulnerable groups, improving human capital, and reducing labour market inequalities (Baldacci et al., 2008; Immervoll et al., 2022). At the same time, digitalisation is increasingly recognised as a key driver of economic transformation, productivity growth, and labour market inclusion, although its effects on job quality remain heterogeneous (Autor, 2015; Hjort & Poulsen, 2019).

Within this context, entrepreneurship has long been regarded as an important mechanism for job creation, innovation, and regional development (Acs, 2006; Fritsch & Mueller, 2004). Yet its contribution to decent work remains less clearly understood. While entrepreneurship can generate employment opportunities and foster economic dynamism, its effects may depend on broader institutional and socioeconomic conditions. In particular, governance quality, social expenditure, and digitalisation may influence labour market outcomes directly while simultaneously shaping entrepreneurial activity. This raises an important question: does entrepreneurship retain an independent association with decent work once these contextual factors are taken into account?

Although previous studies have separately analysed the relationships between governance, social protection, digitalisation, entrepreneurship, and labour market performance, research rarely examines these factors within an integrated framework. As a result, limited evidence exists regarding the extent to which entrepreneurship contributes to decent work after accounting for the broader institutional and policy environment. Addressing this gap is particularly relevant in advanced economies, where improving job quality has become a priority amid technological change, demographic pressures, and evolving labour market structures.

This study develops and tests a model linking governance, social expenditure, digitalisation, entrepreneurship, and decent work across European Union member states. The analysis is grounded in the argument that governance is linked to decent work through its influence on social expenditure and digitalisation, while entrepreneurship may make an additional contribution beyond these institutional mechanisms. To examine these relationships, Partial Least Squares Structural Equation Modelling (PLS-SEM) is applied to a cross-country dataset covering the EU.

The article contributes to the literature in several ways. First, it integrates governance, social expenditure, digitalisation, entrepreneurship, and decent work into a single analytical framework. Second, it evaluates the indirect channels through which governance may influence labour market quality. Third, it assesses whether entrepreneurship maintains a distinct association with decent work after controlling for key institutional and policy factors. By doing so, the study advances understanding of the conditions under which entrepreneurial activity can contribute to more inclusive and sustainable labour market outcomes.

The remainder of the article is organised as follows. Section 2 develops the theoretical framework and hypotheses. Section 3 describes the data and methodology. Section 4 presents the empirical results. Sections

5 and 6 discuss the findings and their implications. Finally, Sections 7 and 8 outline the study's limitations and conclusions.

2. Theoretical framework and formulation of hypotheses

2.1. Governance and the institutional channels for decent work

Governance is widely recognised as a fundamental determinant of economic and social development because it shapes the capacity of public institutions to design, implement, and enforce policies effectively (Kaufmann et al., 2010). By enhancing institutional quality, transparency, accountability, and regulatory effectiveness, governance contributes to the creation of economic environments that favour productive activity, social inclusion, and labour market performance.

From a labour market perspective, governance shapes the conditions under which decent work can develop. Effective institutions support regulatory frameworks that protect workers' rights, facilitate access to employment opportunities, improve public service delivery, and reduce the uncertainty faced by firms and workers. In contrast, weak governance may undermine policy implementation, limit access to social protection, and reduce the effectiveness of labour market interventions (Rodrik et al., 2004; Kaufmann et al., 2010).

The relationship between governance and decent work is particularly relevant because the achievement of high-quality employment depends not only on economic growth but also on the institutional conditions under which economic activity takes place. Well-functioning institutions are more likely to foster labour market environments characterised by employment opportunities, social protection, inclusion, and productive work, all of which are central dimensions of the decent work agenda (ILO, 1999, 2019).

In particular, governance may influence decent work through policy instruments and structural transformation processes. Two mechanisms are especially relevant. First, better governance enhances the efficiency, targeting, and effectiveness of public expenditure, increasing the capacity of social policies to support labour market inclusion and reduce vulnerability. Second, stronger institutions facilitate the adoption and diffusion of digital technologies through improved regulatory quality, investment frameworks, and public sector capacity. These mechanisms suggest that governance can influence labour market outcomes not only directly but also through its impact on social expenditure and digitalisation.

In addition, governance can create institutional conditions that encourage productive entrepreneurial activity. Stable regulatory environments, effective public administration, and stronger rule of law reduce transaction costs and uncertainty, thereby facilitating business creation and growth (Aidis et al., 2008; Estrin et al., 2013). As entrepreneurship constitutes an important channel through which economic opportunities and employment are generated, part of its relationship with decent work may reflect these institutional conditions, which is why its contribution is examined beyond the mechanisms linked to governance (Sect. 2.2).

Consequently, governance should be viewed as a foundational institutional factor shaping the broader environment within which social policies, digital transformation, and entrepreneurial activity operate. This

perspective provides the basis for examining the indirect pathways through which governance may influence decent work and motivates the hypotheses developed in the following sections.

2.1.1. Governance, social spending and decent work

Governance influences welfare and development through the institutional capacity to design, finance and implement public policies. Social expenditure effort constitutes a relevant transmission mechanism, as it reflects the resources allocated to education, healthcare, social protection, labour market policies and income transfers aimed at enhancing economic security, employability and social inclusion. Through these functions, social expenditure can improve labour market outcomes and create favourable conditions for productive economic participation.

These policy domains are closely linked to decent work, understood as opportunities for productive employment under conditions of freedom, equity, security and human dignity (International Labour Organization, 1999). Effective and accountable institutions can therefore strengthen decent work by improving both the allocation and implementation of social resources.

Prior research suggests that governance affects not only the level of public expenditure but also its effectiveness. Corruption can distort spending priorities and reduce investment in key social services (Mauro, 1998), whereas institutional quality improves public service delivery and limits inefficiencies (Gupta et al., 2002). Likewise, Rajkumar and Swaroop (2008) show that public expenditure on education and healthcare generates better outcomes in countries with stronger governance. Consequently, similar levels of social expenditure may produce different social and labour market outcomes depending on institutional quality and spending efficiency (Mandl et al., 2008). Recent evidence further highlights the role of government effectiveness, transparency and corruption control in enhancing spending performance (Mendoza Reyna et al., 2024), although social expenditure levels also depend on broader economic and political conditions (Haelg, 2022). In some contexts, governance improvements may be reflected more in expenditure efficiency than in expenditure growth itself (Jacques, 2024).

Evidence also supports a positive relationship between social expenditure and decent work. Social protection programmes, healthcare services, education and training policies enhance economic security, employability and equality of opportunity (Ghai, 2003). Moreover, investments in education and healthcare contribute to human capital formation and access to more productive and better-quality jobs (Baldacci et al., 2008).

Social expenditure may additionally encourage productive entrepreneurship. By improving skills, health and economic security, welfare policies strengthen individual capabilities and reduce constraints that hinder entrepreneurial initiative. This can facilitate the creation of firms with greater potential for survival, growth and employment generation, thereby indirectly supporting decent work outcomes.

However, social expenditure should be understood as a resource whose effectiveness depends on factors such as coverage, accessibility and service quality (Immervoll et al., 2022). Its impact also varies according to policy design and institutional context (Santos & Simões, 2025). Moreover, welfare systems may be less effective when vulnerable groups remain outside coverage, particularly in settings characterised by labour market informality (Aronsson & De Soysa, 2025). Social expenditure should therefore be viewed as a partial

mechanism operating alongside other institutional drivers, including labour regulation, labour inspection and social dialogue.

Overall, better governance can improve the management of social resources, while social expenditure effort can strengthen human capital, economic security and social inclusion. Through these channels, social expenditure constitutes a plausible mechanism linking governance to improved decent work outcomes.

H1

Social expenditure effort mediates the relationship between governance and decent work.

H1a

Higher levels of governance quality are associated with greater social expenditure effort.

H1b

Greater social expenditure effort is associated with better decent work outcomes.

2.1.2. Governance, digitalisation and decent work

The digital penetration of the economy refers to the availability, adoption and integration of digital technologies across productive, business, administrative and social activities. It encompasses digital infrastructure, internet access, digital skills and the incorporation of digital technologies into economic and labour processes (Goldfarb & Tucker, 2019; Labhard et al., 2025).

The diffusion of digital technologies is strongly conditioned by the institutional environment. Higher-quality governance can foster digitalisation through investments in connectivity and skills, stable policy frameworks, competitive markets and regulations that enhance transaction security, data protection and user rights. Government effectiveness, regulatory quality, the rule of law and control of corruption reduce uncertainty and support investment in digital transformation. Consequently, countries with stronger institutions generally exhibit higher levels of digital penetration, although the strength of this relationship depends on broader economic and technological conditions (Labhard et al., 2025).

Digitalisation can contribute to decent work through multiple channels. By increasing productivity, reducing transaction costs, expanding market access and improving labour market matching, digital technologies may enhance employment opportunities and firms' productive capacity (Eurofound, 2021; Chacaltana et al., 2024). They can also facilitate access to training, employment services and information, thereby influencing employment prospects, earnings and working conditions (Saragih et al., 2024).

In addition, digitalisation may stimulate entrepreneurship by lowering entry barriers, facilitating access to information and finance, reducing operating costs and enabling new business models. These mechanisms can foster innovation and business creation while increasing the potential of entrepreneurial ventures to generate productive employment.

However, the effects of digitalisation are not uniformly positive. Automation may contribute to task displacement and skills obsolescence, while digital surveillance, algorithmic management and platform-based work may create challenges related to job quality, social protection, labour rights and worker representation (Eurofound, 2021; Saragih et al., 2024; International Labour Organization, 2024, 2025). As a result, the impact of digitalisation on decent work depends on complementary institutions, including labour regulation, education and skills systems, social protection arrangements and mechanisms of social dialogue.

Overall, digital penetration represents a plausible mechanism through which governance influences decent work. By creating favourable conditions for technological diffusion, high-quality institutions can support productivity growth, labour market inclusion and entrepreneurial opportunities. At the same time, governance shapes the extent to which digital transformation translates into productive, inclusive and sustainable employment outcomes.

H2

Digital penetration of the economy mediates the relationship between governance and decent work.

H2a

Higher levels of governance quality are associated with greater digital penetration of the economy.

H2b

Greater digital penetration of the economy is associated with better decent work outcomes.

2.2. The residual contribution of entrepreneurship to decent work

Entrepreneurship is widely recognised as a key driver of economic development, innovation and employment creation (Acs, 2006; Karimov & Konings, 2021; Schumpeter, 1934). By creating new firms and introducing new products, services and organisational forms, entrepreneurial activity stimulates competition, enhances productivity and contributes to economic dynamism (Acs et al., 2009; Fritsch & Mueller, 2004). Beyond its economic effects, entrepreneurship may also contribute to decent work by expanding labour market opportunities, facilitating inclusion and generating income-generating activities that support sustainable employment outcomes.

However, the relationship between entrepreneurship and decent work is not independent of the broader institutional environment. As discussed previously, governance quality influences labour market outcomes through multiple channels, including social expenditure and digitalisation (Rajkumar & Swaroop, 2008; Labhard et al., 2025). At the same time, these institutional conditions can foster entrepreneurial activity by reducing uncertainty, supporting innovation and expanding economic opportunities (Nambisan, 2017). Consequently, part of the association between entrepreneurship and decent work may reflect the effects of these underlying mechanisms rather than an autonomous entrepreneurial contribution.

Nevertheless, the literature suggests several pathways through which entrepreneurship may exert an independent influence on dimensions of decent work. First, entrepreneurial activity contributes to labour demand through the creation and growth of new firms. The Schumpeter effect highlights how entrepreneurial dynamism generates employment and can contribute to reductions in unemployment over time, particularly in advanced economies (Fritsch & Mueller, 2004; Thurik et al., 2008). Entrepreneurship may also facilitate labour market reintegration among individuals experiencing prolonged unemployment, especially through self-employment and business creation initiatives targeting disadvantaged groups (Caliendo & Künn, 2011; Odding et al., 2024).

Second, entrepreneurship can promote labour market inclusion among young people. New firms frequently provide employment opportunities for younger workers and may offer alternative pathways to economic participation when conventional wage employment is limited (Ouimet & Zarutskie, 2014). Although barriers such as limited resources, skills and entrepreneurial intentions can restrict these benefits for some young people (Eurofound, 2015; Redmond & McFadden, 2023; Vasilescu et al., 2025), entrepreneurship remains a potentially important mechanism for reducing labour market exclusion.

Third, entrepreneurship may influence income-related dimensions of decent work. Opportunity-driven entrepreneurship, particularly when associated with innovation and business growth, can generate higher earnings and positive spillover effects throughout the economy (Lee & Rodríguez-Pose, 2021; Sorgner et al., 2017). However, the impact is heterogeneous. While employer entrepreneurs often achieve better income outcomes, solo self-employment is frequently associated with lower and more volatile earnings (Auguste et al., 2023; Morris et al., 2020; Sorgner et al., 2017). These differences help explain why the relationship between entrepreneurship and in-work poverty varies across contexts (Perugini & Pompei, 2026).

Overall, existing evidence suggests that entrepreneurship can contribute to decent work through employment creation, labour market inclusion and income generation. Yet it remains unclear whether these effects persist once broader institutional factors are taken into account. This question is particularly relevant within the European Union, where countries differ substantially in governance quality, social investment, digital development and entrepreneurial activity. Accordingly, this study examines whether entrepreneurship retains an independent association with decent work after controlling for the institutional mechanisms linked to governance.

H3

Entrepreneurial activity is positively associated with decent work beyond the mechanisms through which governance is linked to it.

3. Methodology and data

3.1. Research design

This study adopts a quantitative explanatory design to analyse the institutional and entrepreneurial factors associated with decent work across European Union countries. Governance is specified as the main institutional antecedent, while Social Expenditure Effort and Digitalisation act as mediating mechanisms.

Entrepreneurship is incorporated as an additional explanatory factor that may contribute independently to decent work.

The model allows the simultaneous examination of institutional conditions and entrepreneurial dynamics associated with decent work. To analyse these direct and indirect relationships, Partial Least Squares Structural Equation Modelling (PLS-SEM) was employed. This method is suitable for estimating theoretically specified relationships within a causal-predictive framework, testing mediation effects and evaluating predictive performance.

3.2. Sample and data sources

The sample comprises 21 European Union Member States observed over the period 2021–2024, yielding 84 country-year observations. Data were obtained from the Worldwide Governance Indicators (WGI; World Bank, n.d.), Eurostat (n.d.) and the Global Entrepreneurship Monitor (GEM; Global Entrepreneurship Research Association, n.d.).

These sources provide internationally comparable indicators of governance, social expenditure, digitalisation, entrepreneurship and labour market outcomes. Descriptive statistics are reported in Table 1. Missing values (15 of the 84 country-year observations for the four social expenditure indicators, three for ECO and one for TEA) were handled through mean replacement in SmartPLS 4; the affected observations are listed in Supplementary File 2. As several indicators depart from normality, PLS-SEM is an appropriate estimation technique.

Table 1

Descriptive Statistics of the Study Indicators

Indicator	Mean	Median	Min.	Max.	SD	Excess kurtosis	Skewness	CvM	p
COC	0.993	0.800	0.010	2.230	0.683	−1.177	0.342	0.387	< 0.001
ECO	17.025	17.225	4.330	28.870	5.109	0.087	−0.243	0.166	0.014
EDU	5.009	5.000	3.200	7.400	0.822	1.231	0.727	0.372	< 0.001
GEF	1.123	1.050	−0.080	2.160	0.534	−0.875	0.131	0.182	0.009
GGE	46.984	46.984	36.500	57.700	4.488	0.196	0.233	0.222	0.003
HEA	6.707	6.707	4.700	10.100	1.107	0.582	0.562	0.188	0.007
IHO	92.725	92.965	85.070	99.180	3.465	−0.389	−0.161	0.041	0.663
LTU (−)	−2.319	−1.800	−9.200	−0.500	1.575	4.995	−2.057	1.023	< 0.001
NET (−)	−11.280	−10.700	−23.100	−3.900	3.757	0.764	−0.670	0.148	0.025
ROL	1.040	0.985	0.190	2.020	0.538	−1.294	0.168	0.264	0.001
RQL	1.029	0.845	0.240	2.010	0.519	−1.240	0.264	0.320	< 0.001
SPR	17.264	17.264	12.300	26.500	3.160	0.356	0.609	0.234	0.002
TEA	8.667	8.370	1.560	15.130	3.075	−0.427	0.048	0.084	0.181
VOA	1.125	1.145	−0.050	1.910	0.468	−0.171	−0.462	0.081	0.196
WRP (−)	−8.485	−8.200	−15.500	−2.500	2.837	0.039	−0.277	0.056	0.426

Note. N = 84 country-year observations (21 EU Member States, 2021–2024). SD = standard deviation; CvM = Cramér-von Mises statistic; p = p-value of the Cramér-von Mises normality test ($p < 0.05$ indicates departure from normality). Indicators marked (−) were reverse-coded prior to estimation.

Source: Authors' calculations using SmartPLS 4.

3.3. Latent variables and indicators

The model includes five reflective constructs: Governance, Social Expenditure Effort, Digitalisation, Entrepreneurship and Decent Work. Their operationalisation and indicators are presented in Table 2.

Decent Work is measured through long-term unemployment, the share of young people not in employment, education or training (NEET), and in-work poverty. These indicators were reverse-coded so that higher values represent better labour market outcomes.

Entrepreneurship is measured through Total Early-Stage Entrepreneurial Activity (TEA), a widely used indicator of entrepreneurial dynamism and new venture creation. Governance is captured through five WGI dimensions,

while Social Expenditure Effort and Digitalisation are measured using Eurostat indicators.

Table 2
Model Constructs and Indicators

Construct	Code	Indicator	Source
Governance	VOA	Voice and accountability	WGI
	GEF	Government effectiveness	WGI
	RQL	Regulatory quality	WGI
	ROL	Rule of law	WGI
	COC	Control of corruption	WGI
Social expenditure effort	GGE	Total public expenditure	Eurostat
	HEA	Public health expenditure	Eurostat
	EDU	Public education expenditure	Eurostat
	SPR	Public social protection expenditure	Eurostat
Digitalisation	IHO	Household internet access	Eurostat
	ECO	Business turnover generated through e-commerce	Eurostat
Entrepreneurship	TEA	Total early-stage entrepreneurial activity	GEM
Decent work	LTU (−)	Long-term unemployment	Eurostat
	NET (−)	NEET population	Eurostat
	WRP (−)	In-work poverty	Eurostat

Note. Indicators marked (−) were reverse-coded prior to estimation so that higher values represent higher levels of decent work. WGI = Worldwide Governance Indicators; GEM = Global Entrepreneurship Monitor.

Source: Authors' own elaboration.

3.4. Estimation technique: PLS-SEM

The model was estimated using PLS-SEM in SmartPLS 4 (Ringle et al., 2024). Following Hair et al. (2024), the analysis proceeded in two stages.

First, the measurement model was assessed through outer loadings, Cronbach's alpha, rho_A, composite reliability (CR), average variance extracted (AVE) and the heterotrait-monotrait ratio (HTMT).

Second, the structural model was evaluated using variance inflation factors (VIF), path coefficients, coefficients of determination (R^2), effect sizes (f^2) and bootstrapped indirect effects based on 5,000 resamples.

Predictive performance was subsequently examined through PLSpredict and the Cross-Validated Predictive Ability Test (CVPAT).

4. Results

4.1. Assessment of the measurement model

The measurement model was assessed through indicator reliability, internal consistency, convergent validity and discriminant validity, following Hair et al. (2024). Figure 1 presents the estimated model, including the outer loadings, structural relationships and coefficients of determination.

Source: Authors' calculations using SmartPLS 4.

Table 3 reports the indicator loadings, internal consistency and convergent validity statistics. Governance, Digitalisation and Decent Work show satisfactory indicator reliability, with all outer loadings above the recommended threshold of 0.708. Social Expenditure Effort presents more heterogeneous loadings, ranging from 0.600 to 0.790.

Table 3
Reliability and Convergent Validity of Reflective Constructs

Construct	Indicator	Outer loading	Cronbach's α	rho_A	CR	AVE
Governance	VOA	0.943	0.983	0.986	0.987	0.937
	GEF	0.953				
	ROL	0.980				
	RQL	0.982				
	COC	0.981				
Social expenditure effort	EDU	0.790	0.725	0.714	0.784	0.480
	GGE	0.600				
	HEA	0.750				
	SPR	0.611				
Digitalisation	ECO	0.813	0.579	0.587	0.825	0.703
	IHO	0.864				
Decent work	LTU (−)	0.778	0.727	0.783	0.844	0.646
	NET (−)	0.892				
	WRP (−)	0.732				

Note. CR = composite reliability; AVE = average variance extracted. Reference thresholds: outer loadings ≥ 0.708; α, rho_A and CR ≥ 0.70; AVE ≥ 0.50 (Hair et al., 2024).

Source: Authors' calculations using SmartPLS 4.

Internal consistency is satisfactory for Governance, Social Expenditure Effort and Decent Work. Digitalisation has satisfactory composite reliability (CR = 0.825), although its Cronbach's α and rho_A values are below 0.70. Given that Digitalisation comprises only two indicators, these values were considered together with its satisfactory loadings and composite reliability.

Convergent validity is supported for Governance, Digitalisation and Decent Work. Social Expenditure Effort has an AVE of 0.480, marginally below the recommended threshold. The construct was retained because its composite reliability is satisfactory and its indicators capture complementary dimensions of social expenditure. The GGE and SPR indicators, with loadings of 0.600 and 0.611, respectively, were also retained on substantive grounds and because their removal did not materially improve the measurement properties. This qualification is considered when interpreting the structural results.

Entrepreneurship is measured by Total Early-Stage Entrepreneurial Activity as a single-item construct. Its loading is therefore fixed at 1.000, while internal consistency and convergent validity statistics are not applicable.

Discriminant validity was assessed using the heterotrait-monotrait ratio of correlations. As reported in Table 4, all HTMT values are below the conservative threshold of 0.85.

Table 4
Assessment of Discriminant Validity Using the HTMT Criterion

Construct pair	**HTMT**
Governance ↔ Social expenditure effort	0.619
Governance ↔ Digitalisation	0.818
Governance ↔ Decent work	0.632
Social expenditure effort ↔ Digitalisation	0.586
Social expenditure effort ↔ Decent work	0.655
Digitalisation ↔ Decent work	0.842
Entrepreneurship ↔ Governance	0.141
Entrepreneurship ↔ Social expenditure effort	0.452
Entrepreneurship ↔ Digitalisation	0.051
Entrepreneurship ↔ Decent work	0.272
Note. HTMT = heterotrait-monotrait ratio. Reference threshold: HTMT < 0.85 (Henseler et al., 2015).	

Source: Authors' calculations using SmartPLS 4.

The highest HTMT value is observed between Digitalisation and Decent Work (0.842). Although it remains below the recommended threshold, its proximity to 0.85 warrants caution when interpreting the corresponding

structural relationship. Overall, the measurement model provides an adequate basis for evaluating the structural model, subject to the qualifications identified for Social Expenditure Effort and Digitalisation.

4.2. Evaluation of the structural model

The structural model was evaluated by examining collinearity, explanatory power, path coefficients, effect sizes and specific indirect effects. The coefficients are interpreted as structural associations consistent with the proposed framework rather than as evidence of causal effects.

4.2.1. Assessment of collinearity, explanatory power and hypothesis testing

Inner VIF values ranged from 1.000 to 1.245, below the recommended threshold of 3, indicating that collinearity was not a concern. The model explained 41.3% of the variance in Social Expenditure Effort, 39.4% in Digitalisation and 48.6% in Decent Work. Table 5 reports the estimated structural relationships.

Table 5

Structural Model Assessment and Hypothesis Testing

H	Structural relationship	VIF	β	t	p	95% CI	f²	Result
H1a	Governance → Social expenditure effort	1.000	0.643	11.682	< 0.001	[0.526; 0.739]	0.705	Supported
H1b	Social expenditure effort → Decent work	1.245	0.349	3.631	< 0.001	[0.184; 0.563]	0.191	Supported
H2a	Governance → Digitalisation	1.000	0.628	9.786	< 0.001	[0.493; 0.741]	0.650	Supported
H2b	Digitalisation → Decent work	1.245	0.426	4.478	< 0.001	[0.229; 0.594]	0.284	Supported
H3	Entrepreneurship → Decent work	1.004	0.230	2.968	0.003	[0.041; 0.352]	0.103	Supported

Note. H = hypothesis. Two-tailed tests based on bootstrapping with 5,000 resamples. CI = confidence interval. R^2 Social expenditure effort = 0.413; R^2 Digitalisation = 0.394; R^2 Decent work = 0.486.

Source: Authors' calculations using SmartPLS 4.

All five structural relationships are positive and statistically significant, with confidence intervals excluding zero. Governance is strongly associated with Social Expenditure Effort and Digitalisation, with large effect sizes, supporting H1a and H2a. Social Expenditure Effort and Digitalisation are, in turn, positively associated with Decent Work, supporting H1b and H2b. Digitalisation presents the largest association with Decent Work, followed by Social Expenditure Effort, with both relationships showing moderate effect sizes.

Entrepreneurship also remains positively associated with Decent Work when Social Expenditure Effort and Digitalisation are included in the same equation. Although its effect size is smaller, the relationship is statistically significant, supporting the revised H3. Entrepreneurial activity therefore provides additional

explanatory information about Decent Work beyond the two mechanisms through which governance is linked to it. This result does not imply that entrepreneurship operates independently of the broader institutional environment.

4.2.2. Analysis of indirect effects

The mediation hypotheses were assessed using the bootstrapped specific indirect effects. As shown in Table 6, both indirect associations between Governance and Decent Work are positive and statistically significant.

Table 6
Indirect Effects of Governance on Decent Work

Path	**β**	**95% CI**	**p**	**Result**
Governance → Social expenditure effort → Decent work	0.225	[0.123; 0.353]	< 0.001	Significant
Governance → Digitalisation → Decent work	0.267	[0.134; 0.400]	< 0.001	Significant
Total indirect effect: Governance → Decent work	0.492	[0.403; 0.597]	< 0.001	Significant
Note. Indirect effects estimated through bootstrapping with 5,000 resamples. CI = confidence interval.				

Source: Authors' calculations using SmartPLS 4.

Governance is indirectly associated with Decent Work through Social Expenditure Effort, supporting H1, and through Digitalisation, supporting H2. The indirect coefficient through Digitalisation is numerically larger. Together, the two pathways produce a positive and significant total indirect association between Governance and Decent Work.

The Entrepreneurship → Decent Work relationship is conceptually distinct from these indirect effects: Entrepreneurship provides a complementary contribution to Decent Work but is not specified as an additional mediator of Governance.

Overall, the structural results support the proposed framework. Governance is associated with both institutional mechanisms, Social Expenditure Effort and Digitalisation are positively associated with Decent Work, and Entrepreneurship retains an additional positive association with Decent Work.

4.3. Assessment of predictive ability using PLSpredict

The model's out-of-sample predictive performance was assessed using PLSpredict and the Cross-Validated Predictive Ability Test (CVPAT). While R^2 evaluates in-sample explanatory power, Q^2_predict and the prediction-error measures assess predictive performance for observations not used in model estimation. Table 7 reports the results.

Table 7

Explanatory Power and Predictive Ability of the Model

Endogenous construct	R^2	Q^2predict	RMSE	MAE	p (CVPAT)
Social expenditure effort	0.413	0.390	0.803	0.651	0.689
Digitalisation	0.394	0.377	0.814	0.686	0.018
Decent work	0.486	0.315	0.847	0.670	0.007
Overall CVPAT assessment	—	—	—	—	0.009

Note. R^2 evaluates explanatory power; Q^2predict assesses predictive relevance; RMSE and MAE measure predictive accuracy; and CVPAT evaluates predictive superiority relative to a benchmark model (Hair et al., 2024; Shmueli et al., 2019). RMSE = root mean square error; MAE = mean absolute error.

Source: Authors' calculations using SmartPLS 4.

All three endogenous constructs have positive Q^2_predict values, indicating out-of-sample predictive relevance. Social Expenditure Effort presents the highest Q^2_predict value, followed by Digitalisation and Decent Work. However, the CVPAT result for Social Expenditure Effort is not statistically significant, indicating that the model does not demonstrate predictive superiority over the indicator-average benchmark for this construct.

The CVPAT results are statistically significant for Digitalisation and Decent Work, as well as for the model overall. As the differences in predictive loss favour the proposed model, these results indicate predictive superiority over the indicator-average benchmark. The predictive evidence is therefore favourable for the model as a whole, although it is not uniform across the endogenous constructs.

These findings complement the structural results reported in Section 4.2. In particular, the complete Decent Work equation shows out-of-sample predictive relevance.

5. Discussion of the results

This study examined how governance is associated with decent work through social expenditure effort and digitalisation, while considering the additional contribution of entrepreneurial activity. The findings support this framework. Governance is strongly associated with both institutional mechanisms, which are, in turn, positively related to decent work. Entrepreneurial activity also remains positively associated with decent work after these mechanisms are considered. Decent work therefore appears to reflect the complementary contribution of institutional capacity, social investment, digital transformation and entrepreneurship.

The results concerning governance are consistent with institutional theory, which views institutions as arrangements that shape incentives, capabilities and opportunities rather than directly determining socioeconomic outcomes (Acemoglu & Robinson, 2012; North, 1990). In the present model, governance is connected with decent work through two significant indirect pathways. This supports its interpretation as an enabling condition that facilitates mechanisms more immediately associated with labour market outcomes.

The first pathway operates through social expenditure effort. Governance is positively associated with expenditure on education, healthcare, social protection and other public services, while this expenditure is positively related to decent work. This finding accords with research showing that social investment can strengthen human capital, reduce vulnerability and facilitate access to stable and productive employment (OECD, 2023; Stiglitz et al., 2018). Education and healthcare can improve workers' capabilities, while social protection may reduce exposure to income insecurity and labour market exclusion.

However, the association between social expenditure effort and decent work is smaller than that observed for digitalisation. This suggests that expenditure levels alone do not capture the effectiveness of social policy. The translation of public resources into labour market outcomes is also likely to depend on expenditure composition, implementation capacity and access to high-quality public services. Moreover, the measurement limitations identified for Social Expenditure Effort require caution when interpreting the magnitude of its association. The results support social expenditure as one relevant institutional mechanism, but they do not imply that higher aggregate expenditure necessarily produces better employment outcomes.

The second pathway operates through digitalisation, which shows the strongest association with decent work among its predictors. This result is consistent with evidence that digital technologies can support productivity, innovation, access to information and new forms of economic participation (European Commission, 2024; Prytkova et al., 2024). Internet access can broaden opportunities for job search, skills acquisition and remote work, while e-commerce can extend market access and facilitate new business and employment opportunities.

Nevertheless, digitalisation should not be regarded as unconditionally beneficial. Its labour market consequences depend on complementary factors such as digital skills, infrastructure, regulation and social protection. Technological change may also produce displacement, skills polarisation and employment insecurity when its benefits and adjustment costs are unevenly distributed. The positive association found in this study should therefore be interpreted within the institutional and socioeconomic context of the European Union countries analysed. The comparatively high HTMT value between Digitalisation and Decent Work also calls for caution regarding the magnitude and distinctiveness of this relationship.

The findings also support the revised H3. Entrepreneurial activity remains positively associated with decent work after social expenditure effort and digitalisation are included in the model. This is consistent with research emphasising the role of entrepreneurship in innovation, job creation and economic dynamism (Acs et al., 2018; Guerrero & Urbano, 2021; Urbano et al., 2019). Entrepreneurial activity may widen opportunities for labour market participation and facilitate the transformation of knowledge and market opportunities into productive activity.

This result does not mean that entrepreneurship operates independently of institutional conditions. Rather, entrepreneurial activity provides additional explanatory information beyond the two mechanisms through which governance is linked to decent work in the model. Entrepreneurship should therefore be understood as complementary to institutional explanations, rather than as an alternative to them.

The contribution of entrepreneurship is also likely to depend on its nature and quality. Innovation- and opportunity-driven entrepreneurship may generate different employment outcomes from necessity-driven

entrepreneurship, informal activity or precarious self-employment. Because the TEA indicator captures the prevalence of early-stage entrepreneurial activity without directly measuring the quality of the jobs created, the positive association should not be interpreted as evidence that all forms of entrepreneurship contribute equally to decent work.

The mediation results reinforce the complementarity of these mechanisms. Both indirect associations between Governance and Decent Work are positive and statistically significant, with the pathway through Digitalisation being numerically larger than that through Social Expenditure Effort.

The predictive assessment offers complementary support for the framework. The model shows out-of-sample predictive relevance for all endogenous constructs, although predictive performance is not uniform. Evidence is stronger for Digitalisation and Decent Work than for Social Expenditure Effort. These findings indicate that the framework has predictive usefulness, but they should be distinguished from the structural evidence supporting the hypotheses.

Overall, the findings suggest that decent work is associated with the joint contribution of institutional and economic mechanisms. Governance is connected with social expenditure effort and digitalisation, both of which are positively associated with decent work. Entrepreneurial activity provides a further, although comparatively smaller, contribution beyond these mechanisms. The results therefore support an integrated interpretation in which institutional capacity, social investment, digital transformation and productive entrepreneurship contribute in complementary ways to explaining differences in decent work across the countries and years examined.

6. Theoretical and practical implications

6.1. Theoretical implications

This study contributes to the decent work literature by developing an integrated framework that brings together governance, social expenditure effort, digitalisation and entrepreneurship as complementary factors associated with labour market outcomes. The findings suggest that differences in decent work can be understood through the joint contribution of institutional capacity, social investment, technological transformation and entrepreneurial activity. The framework therefore connects institutional and entrepreneurship perspectives that have often been examined separately.

A first contribution concerns the role of entrepreneurship. Entrepreneurial activity remains positively associated with decent work after social expenditure effort and digitalisation are included in the model. This finding extends previous research linking entrepreneurship to job creation, innovation and economic development (Acs, 2006; Fritsch & Mueller, 2004; van Praag & Versloot, 2007) by showing that entrepreneurial activity also provides additional explanatory information about labour market outcomes associated with decent work. Entrepreneurship should therefore be understood not as an alternative to institutional explanations, but as a complementary component of a broader framework linking economic activity to productive employment and Sustainable Development Goal 8.

This interpretation does not imply that entrepreneurship operates independently of the institutional environment. Institutional quality, social policies and technological conditions may shape both entrepreneurial activity and its capacity to generate employment. Rather, the results indicate that entrepreneurship retains a positive association with decent work beyond the two specific mechanisms through which governance is linked to it in the model. The contribution of entrepreneurship is also likely to depend on the nature of the activity concerned, since opportunity- and innovation-driven ventures may generate different employment outcomes from necessity entrepreneurship, informal activity or precarious self-employment.

A second contribution relates to governance and the mechanisms through which it is connected with decent work. The findings support two positive and statistically significant indirect pathways linking governance to decent work through social expenditure effort and digitalisation. Governance is strongly associated with both mechanisms, which are, in turn, positively associated with decent work. These results extend institutional theory by illustrating how institutional quality may be translated into social investment and technological capabilities that are more immediately connected with labour market outcomes (North, 1990; Kaufmann et al., 2010; Rajkumar & Swaroop, 2008).

Social expenditure effort represents one such pathway by supporting human capital, employability, economic security and social protection (Baldacci et al., 2008; Ghai, 2003). However, the comparatively smaller estimated association with decent work suggests that aggregate expenditure levels should not be equated with policy effectiveness. The composition, targeting, accessibility and implementation of social programmes are also likely to influence their labour market outcomes.

Digitalisation presents the largest estimated association with decent work among the predictors included in the model. This finding is consistent with the argument that digital technologies may expand access to information, markets, training and employment opportunities when supported by appropriate institutional and regulatory conditions (Goldfarb & Tucker, 2019; Eurofound, 2021; Chacaltana et al., 2024; International Labour Organization, 2024, 2025; Saragih et al., 2024). Nevertheless, its comparatively large coefficient should not be interpreted as evidence that digitalisation is necessarily the most important causal mechanism. The proximity of the HTMT value between Digitalisation and Decent Work to the recommended threshold also requires caution when assessing the magnitude and distinctiveness of this relationship.

Finally, the study makes a methodological contribution by operationalising selected dimensions of decent work through three labour market deficits: long-term unemployment, youth exclusion from employment and education, and in-work poverty. Although this approach does not capture the full scope of the ILO decent work framework, it provides a multidimensional indicator of labour market inclusion and income adequacy. The combination of explanatory and predictive analyses further allows the structural relationships to be considered alongside the model's out-of-sample predictive performance (Hair et al., 2024; Shmueli et al., 2019). The predictive evidence is favourable for the model as a whole and for Decent Work.

6.2. Practical implications

The findings suggest that policies aimed at promoting decent work should adopt an integrated approach combining institutional development, effective social investment, inclusive digital transformation and support for productive entrepreneurship. These implications should be interpreted as policy directions consistent with the observed associations rather than as estimates of the causal effects of specific programmes.

First, governance provides an enabling institutional environment for the mechanisms considered in the study. Strengthening government effectiveness, regulatory quality, accountability, the rule of law and the control of corruption may improve the capacity of public institutions to design and implement coherent social, digital, labour market and entrepreneurship policies. The findings suggest that the contribution of governance to decent work is associated with its capacity to support such mechanisms, rather than with a direct relationship estimated in the model.

Second, the positive association between social expenditure effort and decent work supports the relevance of investment in education, healthcare and social protection. However, increasing aggregate expenditure alone may not be sufficient. Policy design should also consider the composition, targeting, accessibility and effectiveness of social programmes. Measures that strengthen employability, reduce income insecurity and facilitate labour market participation are particularly relevant, especially for young people, the long-term unemployed and workers exposed to in-work poverty.

Third, the positive association between digitalisation and decent work supports policies that expand digital infrastructure, strengthen digital skills, facilitate technology adoption by firms and modernise public employment and administrative services. These policies should be accompanied by measures addressing digital exclusion, skills displacement, algorithmic management and the employment risks associated with platform work. The objective should therefore be inclusive digitalisation that translates technological adoption into broader and better-quality employment opportunities.

Finally, entrepreneurship policies should move beyond increasing start-up rates and prioritise forms of entrepreneurial activity with the potential to generate productive and sustainable employment. Relevant measures include entrepreneurship education, access to appropriate finance, innovation support, business development services and assistance with scaling and firm survival. Policy assessment should also consider the quality of the jobs generated, including employment stability, income adequacy and access to social protection, since the measure of early-stage entrepreneurial activity used in this study does not distinguish between ventures with different employment outcomes.

Overall, the findings support a coordinated policy framework in which governance provides the enabling environment, while social investment, digitalisation and entrepreneurship operate as complementary mechanisms associated with improved labour market outcomes. Advancing Sustainable Development Goal 8 therefore requires coordination across social, labour, educational, digital and entrepreneurship policies, rather than treating institutional strengthening and entrepreneurship promotion as separate or competing strategies.

7. Limitations and future research directions

The main limitations of the study stem from the availability of comparable data, and they also point to directions for future research.

The analysis covers the 21 European Union Member States and the period 2021–2024 for which harmonised data were available for most of the indicators included in the model; remaining gaps were handled as described in Sect. 3.2. The European Union provides a comparatively homogeneous institutional setting that makes cross-country comparison meaningful, although the relationships may take a different form in

economies with other welfare arrangements or levels of development. The period also coincides with the post-pandemic recovery. As comparable series lengthen and cover more countries, future studies will be able to test the framework across a wider range of contexts and phases of the economic cycle.

The size and structure of the available data also guided the choice of method. PLS-SEM is particularly suited to estimating complex models with several mediating relationships when samples are moderate in size and the data depart from normality, as is the case here (Hair et al., 2024). Its causal-predictive orientation also allows both the explanatory and the predictive relevance of the framework to be assessed. In line with this approach, the estimated paths are interpreted as structural associations consistent with the theoretical framework. As longer series become available, dynamic panel designs will make it possible to analyse within-country changes and the temporal ordering of these relationships.

Likewise, the constructs are measured through the harmonised indicators currently available. Comparable annual data do not yet exist for all the countries and years covered on dimensions such as working conditions and labour rights, the effectiveness of social programmes, workforce digital skills or the composition of entrepreneurial activity by type of venture. For the same reason, and given the number of observations, the model focuses on the pathways derived from the theoretical framework. As such data become available, future research could incorporate these dimensions and additional institutional mechanisms, and examine which forms of entrepreneurship are most closely associated with decent work.

Finally, the analysis is conducted at national level, which is appropriate for examining structural relationships across countries but may conceal differences across regions, sectors and groups of workers. Multilevel designs combining national institutional indicators with regional, firm-level or individual data would complement the present findings.

Within these boundaries, the study offers a framework that brings institutional and entrepreneurial explanations of decent work into a single model and that can be extended as richer data become available.

8. Conclusions

Entrepreneurship is widely promoted as a source of employment, yet much less is known about whether it is related to the quality of work once the institutional setting is taken into account. This study addressed that question for the European Union, asking whether entrepreneurship remains associated with decent work beyond the institutional conditions that shape labour markets. Drawing on institutional perspectives on governance, research on social expenditure, digitalisation and entrepreneurship, and the ILO concept of decent work, it proposed an integrated framework in which governance is linked to decent work through social expenditure effort and digitalisation, and in which entrepreneurship is examined alongside these institutional pathways. The framework was tested with PLS-SEM on data for 21 Member States between 2021 and 2024, and the estimated relationships are interpreted as structural associations consistent with it.

The study's answer is that entrepreneurship remains associated with decent work beyond the institutional mechanisms considered. Early-stage entrepreneurial activity retains a positive and significant association with decent work when social expenditure effort and digitalisation are taken into account, so its link with labour market quality is not merely a reflection of the institutional environment. Although this direct association is

smaller than those of social expenditure effort and digitalisation, it adds explanatory power of its own, as differences in decent work across the Member States examined are better understood when entrepreneurial dynamism is considered alongside institutional conditions.

Governance, for its part, is indirectly associated with decent work through two institutional pathways. Higher governance quality is associated with greater social expenditure effort and greater digital penetration, both of which are in turn associated with better decent work outcomes, with the digital pathway slightly the stronger of the two. This moves the institutional argument beyond the general claim that good governance matters, by identifying two empirically supported routes through which institutional quality relates to labour market inclusion and income adequacy.

These results speak to two bodies of research that have largely developed apart: one concerned with the institutional foundations of labour market outcomes, the other with the employment effects of entrepreneurship. By showing that institutional conditions and entrepreneurial activity each make a distinct contribution to decent work, the study brings the two into a single framework in which they complement rather than compete with each other, and positions entrepreneurship not solely as a product of supportive institutions but as part of the explanation of labour market quality. Methodologically, it operationalises selected dimensions of decent work in a macro-comparative setting through long-term unemployment, youth exclusion from employment and education, and in-work poverty, shifting the focus from the quantity of employment to its inclusiveness and adequacy. The predictive assessment also shows that the framework does more than fit the data, since it outperforms the indicator-average benchmark in predicting decent work, the study's principal outcome, as well as at the overall level.

For policymakers, the findings support treating institutional strengthening, social investment, inclusive digitalisation and entrepreneurship support as complementary levers for advancing Sustainable Development Goal 8, rather than as independent alternatives. These are policy directions consistent with the observed associations, not estimates of the impact of specific programmes. In entrepreneurship policy, this means looking beyond start-up rates. Because early-stage activity spans ventures with very different employment prospects, evaluation should also track venture survival and job creation.

Progress towards decent work in the European Union, then, does not require a choice between strengthening institutions and fostering entrepreneurship. It calls for a common agenda in which capable institutions, social investment and inclusive digitalisation advance together, and in which entrepreneurship is valued as much for the quality of the work it generates as for the number of firms it creates.

Declarations

Funding

No funding was received for conducting this study.

Competing interests

The authors have no relevant financial or non-financial interests to disclose.

Data availability

The data analysed in this study were obtained from the Worldwide Governance Indicators (World Bank), the Eurostat database and the Global Entrepreneurship Monitor (GEM), all of which are publicly available. The country-year dataset used in the estimations is provided in CSV format as Supplementary File 1. Supplementary File 2 contains the definitions, coding and transformations applied to each variable, including the treatment of missing values. Supplementary File 3 reports the full SmartPLS 4 outputs of the PLS-SEM algorithm, bootstrapping and PLSpredict/CVPAT procedures, including the estimation settings. As the analysis was conducted in SmartPLS 4, no custom code was developed. No restrictions apply to the use of these materials for peer review or replication.

Ethics approval

Not applicable. This study is based exclusively on publicly available aggregate country-level data and did not involve human participants or animals.

Consent to participate and consent for publication

Not applicable.

Code availability

No custom code was developed, as the analysis was conducted in SmartPLS 4. The estimation settings and full model outputs are provided in Supplementary File 3.

Author contributions (CRediT)

All authors contributed equally to conceptualization, methodology, formal analysis, investigation, writing, original draft, and writing, review & editing. All authors read and approved the final manuscript.

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Figures

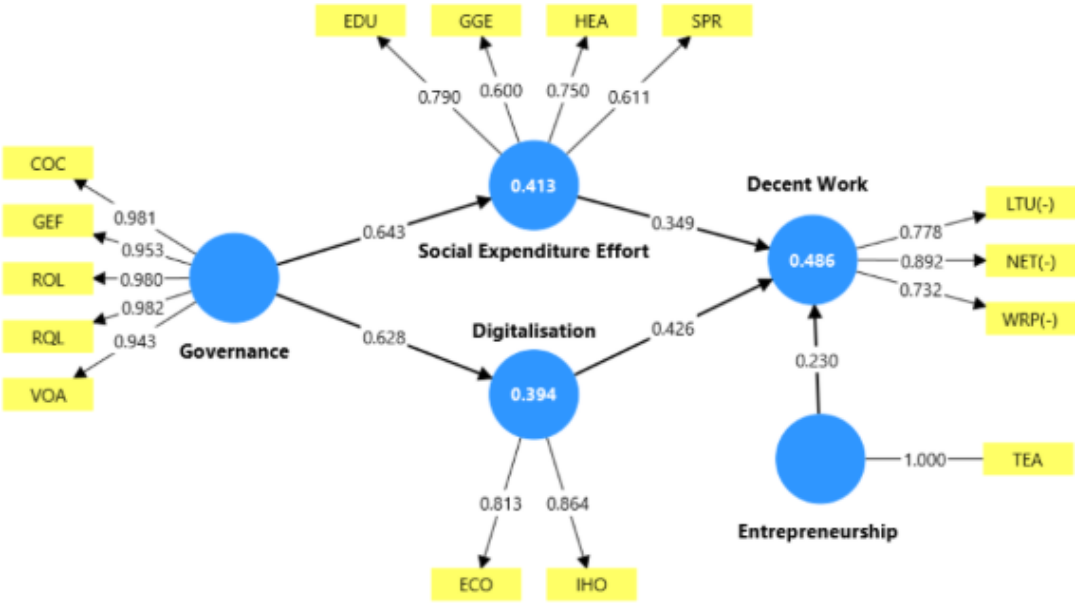


Figure 1

Estimated PLS-SEM structural model: standardised path coefficients, outer loadings and coefficients of determination (R^2)

Source: Authors' calculations using SmartPLS 4.

Supplementary Files

This is a list of supplementary files associated with this preprint. Click to download.

- SupplementaryFile1Dataset.csv
- SupplementaryFile2Variabledefinitions.xlsx
- SupplementaryFile3SmartPLSoutputs.xlsx