Fostering local resilience through digital governance and budget strategies

Local governments are central players in the entrepreneurial ecosystem. Through their policy practices, institutional support, and digitalization strategies, they may influence entrepreneurial endeavors. Development is inherently uneven across territories, and local authorities can combine budgeting and digitalization strategies to foster growth and raise local resilience. Digital governance plays a critical role in enhancing institutional transparency, efficiency, and responsiveness. The digital shift in governance fosters local resilience, thereby enhancing local communities' ability to absorb, adapt to, and recover from systemic shocks.

The intertwinement between locally grounded e-governance and budget strategies with resilience strategies creates adaptive governance structures; this proximity framework enables real-time responses, decentralized coordination, and equitable service delivery. This symbiosis is essential for managing the multidimensional challenges and complex problems that local communities are facing at present across ecological, digital, social, and economic dimensions.

The concept of resilience is gaining momentum in economics, especially in urban and regional economics and economic geography, given the urgency of addressing the determinants of recovery across heterogeneous territories. Moreover, it is an appealing concept given its apparent straightforwardness. Mainstream authors define it as the ability to recover from exogenous shocks of random origin. Consequently, its determinants are multidimensional, encompassing social, economic, institutional, infrastructural, and environmental factors. The pillars of resilience entrench strong social networks, robust governance, economic complexity, adaptable infrastructure, and environmental sustainability. Along with societal factors such as community stewardship, effective communication, and positive economic sentiment. As a consequence, resilience has also gained increasing prominence in public policy debates; in this study, we focus explicitly on its local dimension. We adopt an evolutionary perspective on regional resilience, conceptualizing it not merely as the capacity to absorb and accommodate shocks, but also as the long-term ability of local economies to reconfigure and develop new growth trajectories. Regional resilience is understood not only as the capacity of a region to absorb external shocks, but also as its ability to reconfigure socio-economic and institutional structures in order to generate new growth paths. Accordingly, we adopt a comprehensive perspective on regional resilience that integrates its industrial, network, and institutional dimensions into a unified analytical framework. There is increasing interest in an evolutionary approach to regional resilience. In an evolutionary framework, resilience, in the sense of a region's capacity to sustain long-term development, is regarded as at least as important as its capacity to respond positively to short-term shocks.

Economic resilience at the municipal level has become a central concern for both regional scientists and policymakers, as municipalities are the primary locus for experiencing, absorbing, and mediating economic shocks through local labor markets, firms, and institutions. The study of this framework needs to be further addressed, as it is vital to understand which institutional structures inside the regions are more responsive to the design of new growth paths. The natural perspective is to investigate the direct relationship between the quality of government in regions and their outcomes.

Dissimilarly from broader administrative territories, municipalities disentangle fine-grained heterogeneity in productive structures, governance capacity, social capital, and exposure to external disturbances; these dimensions influence the ability to withstand and adapt to adverse events. Focusing on the municipality scale enables capturing the micro-spatial mechanisms through which resilience is generated, including firm-level adjustments, sectoral reallocations, and policy responsiveness, while reducing the risk of aggregation bias that can overlook localized vulnerabilities.

From a policy perspective, granular analysis is particularly relevant because many resilience-enhancing interventions, such as policy incentives to promote local economic development strategies, infrastructure provision, and targeted social policies, are designed and implemented at this level, making it a critical scale for translating resilience concepts into actionable public policy. The economic resilience framework, increasingly embraced by regional scientists and economic geographers, has introduced substantive empirical challenges. The region’s capacity to absorb shocks, adapt to structural change, and sustain long-term development in the face of economic, technological, and environmental disruptions will determine the prosperity levels of communities. Chief among these is the identification of the determinants of resilience—namely, the structural, institutional, and contextual factors that shape the observed evolutionary trajectories of regional robustness and adaptive capacity. Rooted in localized capabilities—such as diversified economic structures, skilled labor, robust institutions, and dense social networks—resilience is inherently place-specific and cannot be imported wholesale. Policymakers can actively foster economic resilience by strategically directing resources and policy efforts toward areas with the greatest power. However, this task entails new challenges, particularly in the design and implementation of policy interventions capable of supporting heterogeneous territories in recovering from deep and prolonged crises while simultaneously sustaining inclusive and durable growth.

Portugal faces an increasing rural-urban divide, manifested by uneven access to services, digital infrastructure, and economic opportunities, which exacerbates regional disparities and hinders inclusive development. The countryside is experiencing progressive desertification, driven by population decline, land abandonment, and climate stress, threatening ecological balance and regional sustainability. This fragmentation further erodes the ability to recover from exogenous shocks. Rural divides can be minimized through e-governance and public investment by providing remote access to public services, reducing the need for physical infrastructure and travel, and increasing the availability of an accurate business climate, which will attract new entrepreneurial endeavors. Digital platforms enable citizens to benefit from public services and raise their proximity to public policies.

E-government has emerged as a critical enabler of local economic resilience by enhancing municipalities' capacity to respond to shocks in a timely, transparent, and coordinated manner. With the digitalization of public services and administrative processes, local governments can reduce transaction costs, maintain service continuity during disruptions, and improve information access for firms and households, thereby mitigating the short-term impacts of crises. Beyond crisis management, e-government strengthens adaptive capacity by improving data availability, interdepartmental coordination, and citizen engagement, thereby supporting more responsive and evidence-based policymaking. Moreover, digital governance infrastructures can amplify the effectiveness of place-based policies by enabling targeted interventions and reducing implementation frictions, particularly in resource-constrained municipalities. As such, e-government should be viewed not merely as a technological upgrade but as a structural component of local institutional resilience and long-term economic adaptability.

Many cities worldwide aim to transform themselves into smart cities under smart government. This is critical to mitigating the rural-urban divide by leveraging technology, data-driven decision-making, and inclusive policies to diminish regional disparities. This governance prioritizes expanding broadband access and digital infrastructure in rural areas, reducing geographic isolation, enhancing access to online services, and empowering local businesses to participate in global markets. Also, they will provide rural communities with essential services typically concentrated in urban centers. The divide jeopardizes job opportunities in rural areas, generating income and wealth disparities and reduced market access, weakening resilience. The laggard territories are endowed with less infrastructure and connectivity, being lateral to the established networks. Additionally, there is less availability of human capital and education, and due to asymmetric policies, limited educational outcomes and skill development result in brain drain. Healthcare and social services are overlooked, generating public service gaps. The drainage of these regions further enforced migration and the destruction of the agglomeration effects. Also, these communities have weaker political power and less ability to defend their interests. These dynamic vectors create a self-destructive cycle in which rural underdevelopment draws people into cities, further widening the divide. However, understanding these root causes is key to designing policies that promote balanced regional development and reduce spatial inequalities. Smart governance can transform rural areas from being seen as peripheral or "left behind" to becoming connected, vibrant, and future-ready communities. By leveraging technological advances to enhance public service delivery, foster citizen engagement, and promote sustainable development, this governance directly challenges the structural factors that perpetuate the urban-rural divide. As such, it can be a powerful policy strategy to reduce the urban-rural divide.

The emergence of new businesses is a noteworthy result of municipal investment, as these firms are often key to fostering local innovation, creating jobs, and promoting economic growth. Municipalities widely acknowledge the crucial importance of firms in income generation and economic growth; developing budgetary options for public investment seems central to promoting an accurate entrepreneurial ecosystem.

We propose a quantitative analysis of the importance of digital maturity along with public economic investments in improving local community resilience. The econometric estimations cover the 308 Portuguese municipalities, gathering indicators on municipal digital maturity, municipal spending, policy tools, environmental performance, and the demographic and social dimensions of sustainability, as well as economic indicators on income generation and welfare.

The data is collected at the municipality level, provided by Statistics Portugal and Pordata, and it is publicly available. To address resilience, and in accordance with the previous theoretical contextualization, a composite proxy was constructed to illustrate the annual growth of the net balance between firm creation and destruction. In the econometric estimation, the explanatory variables focus on the stages of e-government maturity and budgetary strategies. Multiple models were run, with maturity either as a ranking or as a set of dummy variables for each stage. To complement this effect, different controls were included: initially, one indicator of governance quality, proxied by municipal accounts; and secondly, variables related to urbanity and being a favored region.

Empirical results show that engagement in local government digital strategies benefits communities. Also, the results support the idea that rural communities can benefit even more from this new paradigm, which may help mitigate the divide. Also, the combination of budgeting strategies targeting investment with digitalization further enhances the ability to recover.

Local governance is a proven determinant that, through policy mixes, will promote resilience in their communities, accelerating the pace of recovery and fostering sustained paths of growth.

The paper has a twofold aim: to advance theoretical understanding by integrating two largely overlooked bodies of scholarship, namely the literatures on local economic resilience and digital and budgetary strategies, as well as to provide an empirical contribution by identifying the determinants of local economic resilience, with particular emphasis on the role of digitalized governance and public investment.

The auspicious results of promoting the digital shift in the public sector, while bringing content to the debate on resilience, enrich the discussion on the role of this type of governance in local communities and seize opportunities, particularly during challenging periods such as crises. Above all, perhaps the concept of local resilience encompasses a broader approach in which organizations, policymakers, and communities work together, and digital governance reinforces their cohesion.