

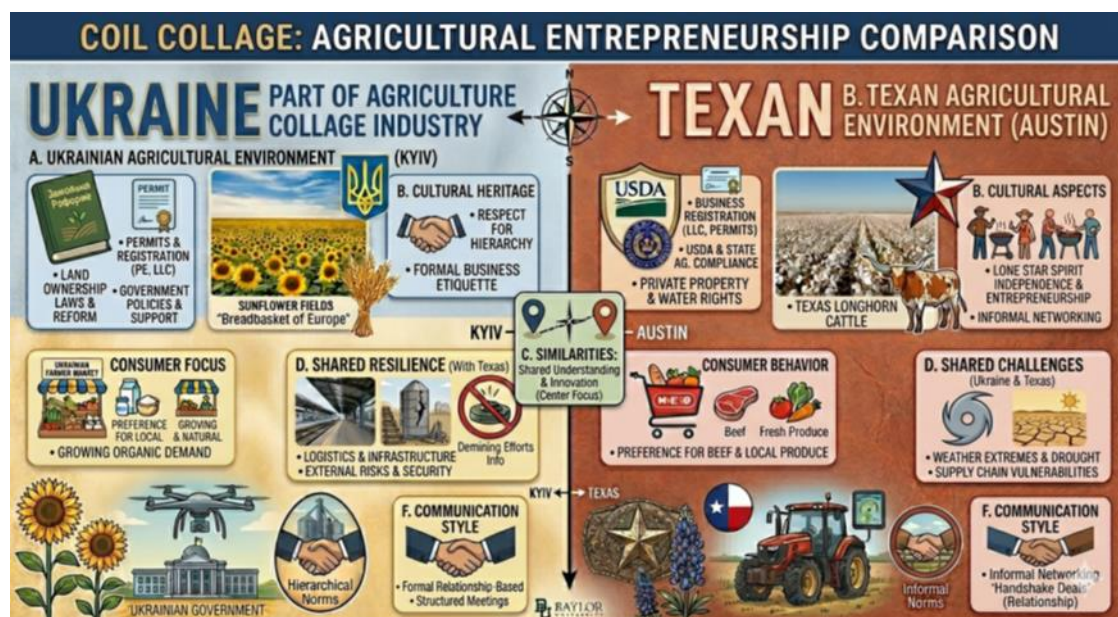


Fig 1. Image generated by Canva AI.

Ultimately, this research underscores that despite these geographic and structural divergences, a shared imperative exists: the necessity for entrepreneurs to remain agile and technologically adaptive. Whether navigating the formal hierarchies of the Ukrainian market or the relationship-driven handshake culture of Texas, the ability to align business operations with local regulations and shifting consumer demands is the primary determinant of long-term viability. By utilizing the COIL framework to bridge these two perspectives, this study demonstrates that understanding the interplay between culture, law, and environmental conditions is essential for securing food systems and fostering innovation in diverse global contexts.

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COMPARATIVE ANALYSIS OF BIOTECH ECOSYSTEMS: UKRAINE VS. TEXAS A Study of Regulation, Capital, and Cultural Drivers in Emerging and Mature Markets

Viktoriia Synilnyk

vikasinilnik27@gmail.com

Cherkasy State Business College

Trinity McWhorter, Evan Perez, Reeves Poindexter, Patric Meehan,

Baylor University, USA

Project Supervisors: Christina Iluzada, PhD; Hankamer School of Business, Baylor University

Iryna Ivanova, PhD, Cherkasy State Business College

The global biotechnology industry does not operate in a vacuum; rather, it is a product of the regional intersection of regulation, capital availability, and ingrained business culture. As the world

pivots toward bio-based economies, understanding how different jurisdictions nurture or hinder innovation becomes vital for entrepreneurs and policymakers alike. This paper provides a comprehensive exploration of two distinct biotech environments: Ukraine and Texas. While both regions are experiencing a surge in digital health and biotechnological innovation, their respective paths to success are shaped by vastly different socio-economic realities – one driven by the necessity of resilience and the other by the momentum of scale.

This research was developed as a direct outcome of a Collaborative Online International Learning project, which brought together diverse academic perspectives to examine the global biotechnology landscape. This collaborative framework allowed for a unique synthesis of localized data, cultural insights, and regulatory comparisons that form the basis of this paper.

Ukraine: Resilience as a Catalyst for the New IT

Ukraine represents a resilient, emerging market that is increasingly being branded as the country's "New IT" sector. Historically known for its strong agricultural base and burgeoning software engineering talent, the nation is now leveraging these strengths to carve out a niche in biotechnology. The legal and regulatory structure of Ukrainian biotech is currently undergoing a radical transformation, defined by a strategic alignment with the European Union (EU). This Euro-optimization is not merely bureaucratic; it is a mechanical necessity for integration into high-level Research and Development (R&D) programs such as Horizon Europe and the WINWIN global innovation initiative.

However, the capital landscape in Ukraine remains a significant challenge. The venture capital (VC) pool is relatively limited, a direct consequence of a high-risk environment characterized by geopolitical instability and the ongoing process of national recovery. To circumvent these hurdles, Ukraine has adopted a model of specialized cluster cities. These hubs act as concentrated ecosystems where academia, startups, and local government collaborate to accelerate information transfer and achieve industry scaling despite broader macroeconomic pressures.

The Ukrainian biotech identity is uniquely bifurcated between agricultural applications (AgriTech) and digital health. In the agricultural sector, the focus is on enhancing crop resilience and sustainable yields, aligning with the country's role as a global breadbasket. Simultaneously, eHealth and telemedicine have seen rapid, widespread adoption. In the context of war and displacement, digital health has moved from being a modern convenience to a vital necessity, allowing for remote diagnostics and the management of patient data under extreme conditions. Culturally, the business environment remains deeply personal, rooted in long-term professional relationships and high-stakes trust. While systemic challenges like corruption and conflict persist, they are being countered by sophisticated rebuilding strategies and a clear-eyed focus on breaking into the lucrative EU export market.

Texas: The Momentum of Texas-Sized Ambition

In stark contrast, Texas offers a mature, high-velocity, and investment-friendly environment characterized by what locals call Texas-sized ambition. The state has positioned itself as a primary alternative to the traditional coastal biotech hubs of Boston and San Francisco, offering a more favorable tax climate and massive land resources for manufacturing and laboratory expansion. The regulatory landscape is highly established, providing a predictable – if rigorous – pathway through the FDA for pharmaceutical developments and the USDA for agricultural biotechnology.

The current Texan market is defined by intense financial activity. Recent data shows a significant 32% jump in Mergers and Acquisitions (M&A) activity within the region. This surge is driven largely by patent cliffs – the looming expiration of major drug patents that forces pharmaceutical giants to aggressively acquire innovative startups to replenish their pipelines. Consequently, M&A has surpassed Initial Public Offerings (IPOs) as the primary exit strategy for smaller firms.

However, the Texan model is not without its hurdles. Recent trends show a decline in preclinical investment (dropping from 38% to 28% of total biotech funding) as investors pivot toward safer, later-stage companies. This shift is partly due to regulatory uncertainty surrounding high-profile sectors like vaccines and GLP-1 medications (weight-loss drugs). Culturally, the Texas ecosystem is

built on a blend of traditional rugged individualism and high-speed modern entrepreneurship. Here, networking is a high-contact sport, and business behavior is driven by choice, advancement, and the pursuit of global market dominance. Unlike the necessity-driven innovation of Ukraine, Texan innovation is fueled by the competitive urge to scale faster and larger than the competition.

Comparative Synthesis: Divergence in Focus and Lifecycle

When comparing these two regions, a fundamental divergence in industry focus becomes evident. Texas is predominantly centered on the big pharma model – high-capital, high-reward drug development that requires decades of clinical trials and billions in investment. Ukraine's strengths, conversely, lie in adaptive biotechnology – agritech, diagnostics, and digital health solutions that can be deployed quickly and provide immediate utility in a developing or recovering economy.

The differences extend to the very lifecycle of a startup. In Texas, the goal is often rapid scaling followed by a lucrative acquisition by a multinational corporation. Success is measured by speed to market and valuation at exit. In Ukraine, the lifecycle is defined by sustainability and resilience. A successful startup is one that can navigate regulatory shifts, secure international R&D partnerships, and maintain operations amidst national crisis.

Despite these profound contrasts in capital access and cultural temperament, Ukraine and Texas share a common trajectory. Both regions are witnessing an irreversible integration of technology into healthcare, where data-driven insights are becoming as valuable as biological reagents. Whether driven by the urgency of national survival in Ukraine or the competitive pressures of the global market in Texas, both ecosystems operate on a shared belief in the transformative power of biotechnological innovation. As Ukraine continues its path toward EU integration and Texas solidifies its role as a global biotech powerhouse, the exchange of ideas between these two distinct laboratories of innovation will likely define the next decade of the industry.

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