

FROM RESEARCH TO REVENUE



How University Innovation Can Transform Pakistan's GDP

NOV, 2025



Mapping Pakistan’s ORIC Future

Pakistan’s first national benchmarking and evaluation framework dedicated to strengthening university innovation, commercialization, and research impact



Advancing Knowledge, Innovation & Impact

DRI serves as the institutional backbone for national research and innovation projects, driving initiatives that transform academic research into economic and societal value



Research & Data Wing of DRI

**Responsible for data analysis, economic modeling,
and quantitative assessment of Pakistan’s university
innovation landscape, ensuring accuracy and
objectivity throughout this report**

Message from Prof. Dr. Akhlas Ahmed

Founder, President, & C.E.O, Dynamic Research Institute
Patron-in-Chief, Shehnaz Index

As Pakistan strives to build a resilient, knowledge-driven economy, our universities stand at the frontlines of innovation and change. The journey from research to revenue is not merely a slogan—it represents the transformation of knowledge into national prosperity.

This report, *“From Research to Revenue – How University Innovation Can Transform Pakistan’s GDP,”* presents a data-driven insight into how academic innovation can directly influence economic growth. It highlights the untapped potential within our universities and quantifies the economic loss caused by under-utilized research outcomes and inactive ORIC structures.

At the **Dynamic Research Institute (DRI)**, supported by the **Shehnaz Index (SI)**, we remain dedicated to bridging the gap between ideas and impact—empowering universities to commercialize research, create startups, and contribute to Pakistan’s GDP. This report is not just an analysis; it is a call to action for policymakers, academia, and industry to collaborate toward an innovation-led economy.

Together, we can turn Pakistan’s research into real economic value—creating jobs, attracting investment, and securing a sustainable future.

“Transforming Knowledge into Prosperity”

Acknowledgements

The preparation of “*From Research to Revenue – How University Innovation Can Transform Pakistan’s GDP*” represents the collective effort of dedicated professionals committed to strengthening Pakistan’s knowledge economy.

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Executive Summary

Pakistan stands at a defining moment in its pursuit of economic transformation. Despite having over 270+ universities and thousands of annual research outputs, the country continues to face a persistent gap between **knowledge creation and economic utilization**. The absence of strong innovation ecosystems within universities—particularly the limited functionality of Offices of Research, Innovation & Commercialization (ORICs)—has prevented academic research from evolving into commercial ventures that contribute meaningfully to Pakistan’s GDP.

This report, “**From Research to Revenue – How University Innovation Can Transform Pakistan’s GDP**,” examines how university-led innovation can serve as a catalyst for national economic growth. Developed jointly by the **Dynamic Research Institute (DRI)** and the **Shehnaz Index (SI)**, the study quantifies the potential GDP contribution that could emerge if Pakistan’s higher education institutions fully activate their ORICs and align research with commercialization goals.

Preliminary modeling conducted by the **Dynamic Research Center (DRC)** indicates that even modest activation of innovation and technology transfer offices could contribute an estimated **0.8% to 1.3% increase in Pakistan’s annual GDP** over a five-year horizon—through startup creation, patent licensing, industry partnerships, and job generation.

The report also identifies a critical **economic loss**: Pakistan potentially forgoes billions in untapped value each year due to underutilized research and lack of structured commercialization mechanisms. Weak linkages between academia, industry, and policymakers further limit the country’s capacity to translate intellectual output into financial growth.

International evidence from countries like **Malaysia, Turkey, and the United States** shows that university innovation ecosystems play a direct role in GDP expansion by promoting **technology-driven entrepreneurship** and enhancing **industrial competitiveness**. Pakistan can achieve similar outcomes through policy coherence, capacity building, and targeted funding for innovation-ready universities.

The findings presented here underscore a national opportunity: by transforming ORICs into dynamic engines of commercialization, Pakistan can reposition its universities as contributors to economic resilience, exports, and sustainable development goals (SDGs).

This report serves not only as an analytical document but also as a **call to action**—inviting the Higher Education Commission (HEC), government institutions, private sector partners, and universities to collaborate in building an innovation-led economy.

“When research meets revenue, progress becomes measurable.”

Introduction & Background

Pakistan’s Economic Challenges and the Role of Universities

Pakistan’s economy faces a complex set of challenges: stagnant productivity, low export diversification, and minimal integration of research into industrial value chains. Despite hosting a vast higher education network with over 270+ universities and thousands of annual research publications, the conversion of academic knowledge into economic outcomes remains negligible.

Table 1: Provincial Distribution of Universities with Active ORICs (as of 2025)
 Source: Shehnaz Index (2025), DRC Analysis.

Province	Total Universities	Active ORICs	Non-ORIC Universities	% with ORIC
Punjab	70	30	40	43%
Sindh	50	25	25	50%
KPK	35	20	15	57%
Islamabad	25	18	7	72%
Balochistan	10	2	8	20%
Gilgit Baltistan	2	1	1	50%
AJK	5	1	4	20%

Globally, universities act as **innovation hubs**—bridging research, technology, and entrepreneurship. In Pakistan, however, most institutions still operate as teaching centers rather than engines of innovation. The country’s innovation ecosystem remains underdeveloped, with limited pathways for technology transfer, startup incubation, and intellectual property commercialization.

The **Office of Research, Innovation & Commercialization (ORIC)**, envisioned by the Higher Education Commission (HEC), was designed to change this landscape. Yet, over a decade later,

many ORICs remain underfunded, undertrained, or inactive—creating a national gap between **research potential and economic impact**.

This gap represents a critical missed opportunity: if university research were effectively harnessed, it could contribute significantly to **GDP growth, employment generation, and industrial competitiveness**.

From Research to Revenue: The Concept and Rationale

The idea of “From Research to Revenue” is grounded in a simple economic truth—**knowledge has value only when it is applied**.

Every research project, patent, and student innovation carries the potential to generate products, services, and startups that contribute directly to economic expansion.

However, the absence of structured commercialization pathways within most Pakistani universities limits this transformation. Without active ORICs, research often remains confined to journals rather than the marketplace.

This report explores how university-led innovation can transition from theoretical outputs to **market-driven value creation**, establishing universities as core contributors to Pakistan’s **knowledge economy and GDP growth**.

Aligning with SDGs & National Knowledge Economy Vision

The transformation of Pakistan’s research landscape directly aligns with the **United Nations Sustainable Development Goals (SDGs)**—particularly:

- **SDG 8:** Decent Work and Economic Growth
- **SDG 9:** Industry, Innovation, and Infrastructure
- **SDG 4:** Quality Education

Strengthening ORICs and building university–industry partnerships can enable Pakistan to meet these global commitments while addressing domestic economic priorities.

The **Dynamic Research Institute (DRI)** and **Shehnaz Index (SI)** envision universities as **strategic economic actors**—not just centers of education. Through innovation, commercialization, and collaboration, universities can become catalysts for a more self-sustaining and resilient national economy.

Methodology

Data Sources and Analytical Framework

This report builds upon a combination of **primary insights** and **secondary data sources** collected through the Dynamic Research Center (DRC) of the **Dynamic Research Institute (DRI)**. The analytical process focused on integrating multiple datasets from:

- The **Higher Education Commission (HEC) Pakistan** – institutional statistics and ORIC listings.
- The **Pakistan Bureau of Statistics (PBS)** – GDP, employment, and industrial output data.
- **World Bank** and **UNESCO Institute for Statistics** – comparative indicators for innovation and higher education.
- Select **university ORIC reports** and publicly available innovation data.

The research team conducted cross-sectional and time-series analysis to examine the relationship between **university innovation capacity** and **economic performance indicators**.

Economic Impact Estimation Model

To estimate the potential contribution of university innovation to Pakistan’s GDP, DRC developed an **Innovation-to-GDP Simulation Model (IGSM)** — a customized analytical framework that measures how increased commercialization and research activation translate into economic output.

Key parameters include:

- Annual number of active ORICs and functional innovation offices.
- Research-to-market conversion rate (patents, startups, technology licenses).
- Average revenue generated per commercialization unit.
- Employment multiplier from university startups.
- Sectoral contribution ratios based on international benchmarks (Malaysia, Turkey, and the USA).

Using conservative assumptions, the model estimates that improved ORIC functionality and research commercialization could generate an additional **0.8%–1.3% GDP growth** within five years.

Limitations and Scope

While this study provides a robust framework, it acknowledges certain limitations:

- Reliable ORIC-level financial data is limited due to inconsistent reporting by universities.
- The economic modeling assumes stable macroeconomic conditions and constant education spending.

- The scope is limited to **HEC-recognized universities** and **documented ORIC activities** as of FY 2024–25.

Despite these limitations, the findings present a credible approximation of the **economic potential of university-led innovation** in Pakistan and provide a foundation for policy and institutional reform.

The Current Landscape of University Innovation in Pakistan

Status of Research Commercialization and Startups

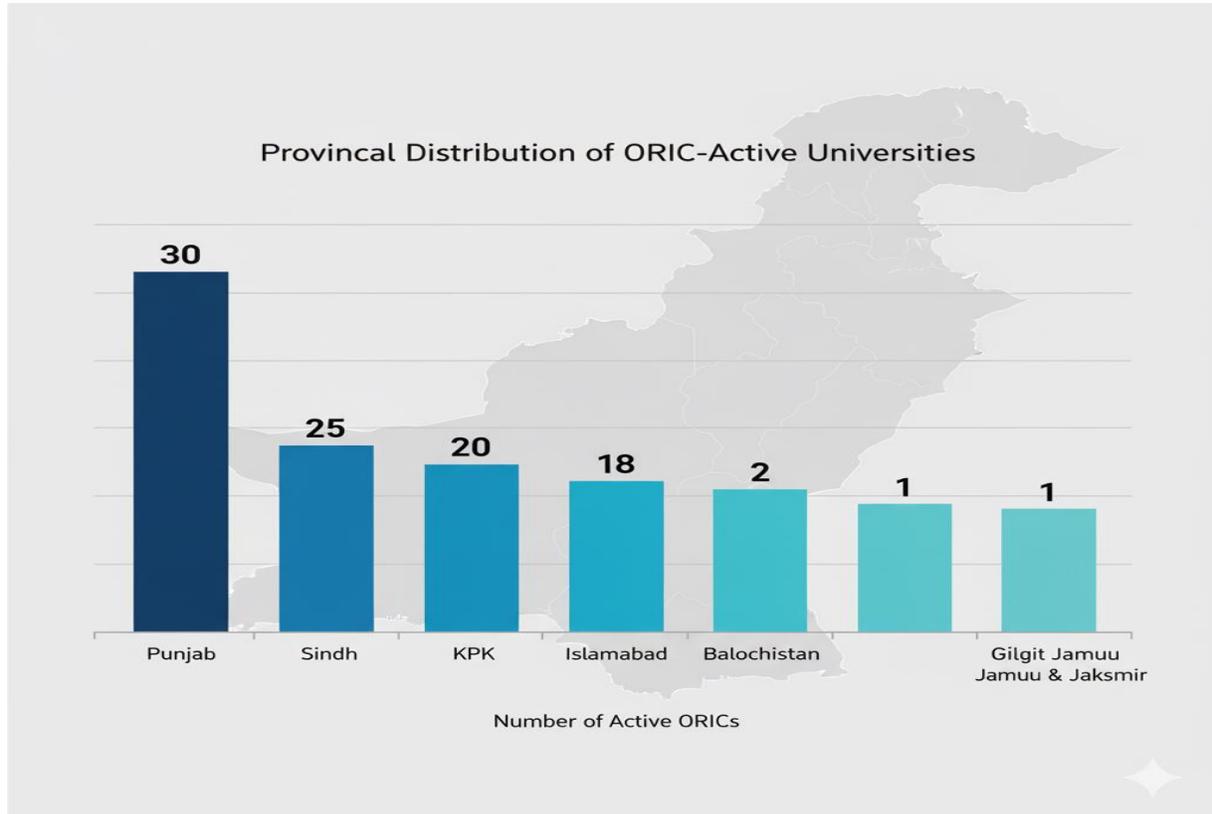
Pakistan’s higher education system has witnessed a steady rise in academic research output over the past decade, yet this growth has not translated into parallel increases in innovation or commercialization.

Among 270+ universities and degree-awarding institutions, only a small fraction maintain **active ORICs** capable of facilitating technology transfer, intellectual property (IP) management, or startup incubation.

Most research remains **publication-oriented** rather than **application-oriented**, resulting in limited market utilization. The absence of clear commercialization frameworks, seed funding mechanisms, and industry linkages continues to restrict the conversion of university ideas into profitable enterprises.

Available data from the Higher Education Commission (HEC) and internal assessments by the **Shehnaz Index (SI)** indicate that less than **15% of Pakistani universities** have established structured innovation pipelines—covering patent filing, product testing, or startup mentoring.

Figure 1: Provincial Distribution of Active ORICs across Pakistan (2025)
Source: DRI, Shehnaz Index Database.



ORIC Functionality and Innovation Readiness

The establishment of ORICs across universities was a crucial step toward institutionalizing research management and innovation. However, their functionality varies drastically. Many ORICs face issues such as:

- Inadequate staffing and professional expertise.
- Minimal financial autonomy and limited funding for R&D.
- Weak linkages with industry and venture capital networks.

According to the **Shehnaz Index (2025)** baseline, approximately **180 universities** remain without operational ORIC departments.

Those that do exist often function administratively rather than strategically—focusing on paperwork, compliance, or conference coordination instead of innovation and commercialization outcomes.

This underutilization not only undermines university competitiveness but also causes significant economic opportunity loss, as potential innovations never reach commercialization stages.

Institutional Gaps and Funding Constraints

One of the most pressing barriers to innovation in Pakistan’s universities is **funding inconsistency**. While developed nations invest 2–4% of GDP in research and development (R&D), Pakistan allocates less than **0.3%**, with only a small portion directed toward university innovation programs.

Additionally, universities lack dedicated **innovation funds, seed grants, and IP protection mechanisms**.

The result is a fragmented system where talented researchers struggle to move ideas beyond laboratory prototypes, and promising projects fail to attract industrial investment.

Furthermore, the **policy disconnect** between higher education, industry, and economic planning ministries has resulted in overlapping mandates and inefficient coordination. Without a national framework aligning research with GDP-oriented outcomes, Pakistan’s innovation ecosystem remains underperforming.

In summary, Pakistan’s universities possess enormous intellectual potential, but weak institutional infrastructure and policy fragmentation limit their economic contribution. If ORICs are restructured to operate as **innovation accelerators**, universities could become major contributors to **GDP growth, job creation, and export competitiveness**.

Quantifying the Economic Impact of ORIC Inactivity

GDP Contribution Potential of University Innovation

The transformation of university research into innovation-driven products and startups has proven to be a direct contributor to national GDP growth in multiple economies. Globally, university innovation contributes between **1% to 4%** of GDP in knowledge-driven economies like the USA, South Korea, and Malaysia—through startup formation, patent licensing, and industry collaboration.

Applying comparable but conservative assumptions to Pakistan, estimates from the **Dynamic Research Center (DRC)** suggest that activating functional ORICs in all major universities could contribute between **0.8% and 1.3% GDP growth annually** over a five-year period.

Table 2: Projected Impact of Enhanced ORIC Activity on R&D and GDP
 Source: DRC Simulation Model, 2025.

Category	Current (2025)	With ORIC Strengthening	Potential Increase
National R&D Spend (% of GDP)	0.3%	0.8%	+0.5%
University Innovation Projects	~120	~450	+275%
GDP Impact from Innovation	0.4%	1.3%	+0.9%

This impact would emerge through:

- **Startup generation:** commercialization of student and faculty research leading to new ventures.
- **Patent licensing and royalties:** universities monetizing intellectual property.
- **Technology partnerships:** joint R&D projects with local industries.
- **Export of innovations:** technology-based products and services entering regional markets.

In economic terms, this potential equals an annual **increment of USD 3–5 billion**, assuming a baseline GDP of around USD 370 billion.

Estimating the Economic Loss from Dormant ORICs

The opportunity cost of inactive ORICs is equally significant. With nearly **180 universities** lacking active ORICs, Pakistan forfeits an estimated **USD 2.5–3**

billion annually in unrealized research value and innovation-led enterprise. This includes:

- Uncommercialized research projects that could have evolved into startups.
- Missed patent filings and licensing opportunities.
- Lost potential for employment and industrial diversification.

Beyond financial loss, the absence of effective ORICs has a **multiplier effect**—reducing job creation, innovation-driven exports, and private-sector collaboration. The unrealized potential of 10,000+ annual postgraduate theses alone represents billions in unconverted intellectual capital.

Impact on Employment, Exports, and Technology Development

If each active ORIC successfully facilitates only 10 new startups per year—with an average of 8 employees per startup—that alone could generate **over 14,000 new jobs annually**. This cascade would further stimulate local manufacturing, services, and tech-based exports, contributing directly to Pakistan’s broader economic resilience.

Enhanced commercialization activities would also:

- Boost **high-skill employment** in STEM sectors.
- Strengthen **university–industry trust** for co-innovation.
- Enable **import substitution** through local technology solutions.

In short, every rupee invested in university innovation yields **multi-fold economic returns** through job creation, tax contribution, and increased national productivity.

The evidence is clear

Inactivity of ORICs is not just an academic inefficiency—it is an **economic loss**. Conversely, activating and empowering these centers can help Pakistan bridge the gap between **research excellence and economic growth**, steering the country toward sustainable GDP expansion.

Global Benchmarks and Best Practices

International University Innovation Models

Across the world, universities have evolved from academic institutions into **economic accelerators** — driving industrial growth, job creation, and national competitiveness. Three models stand out for their successful integration of research and commercialization:

This highlights how university-led innovation contributes to GDP in other countries, establishing global benchmarks for Pakistan’s innovation ecosystem.

It allows policymakers to understand how activating university ORICs could help bridge Pakistan’s gap in R&D, patents, and commercialization.

Comparative Dataset

Indicator	USA	Malaysia	Turkey	Pakistan
R&D Spending (% of GDP)	2.8%	1.3%	1.1%	0.3%
University-Generated Startups (Annual Avg.)	3,500+	280	190	<50
Patents Filed Annually (University Origin)	7,000+	820	460	<100
Active University Innovation Offices / ORICs	100%	92%	88%	~35%
GDP Contribution from University Innovation	~3.0%	1.6%	1.3%	<0.5%
Innovation Policy Integration (National Level)	Strong	Moderate	High	Emerging

1. United States – The Bayh-Dole Model

The *Bayh-Dole Act (1980)* allowed U.S. universities to own and commercialize federally funded research.

This single policy reform transformed higher education into a cornerstone of the U.S. innovation economy.

Today, university-originated technologies account for **over 13,000 startups** and contribute billions to GDP annually.

The U.S. model emphasizes:

- Clear intellectual property ownership policies.
- Dedicated Technology Transfer Offices (TTOs).
- Industry-funded research partnerships.

2. Malaysia – The Applied Innovation Ecosystem

Malaysia integrated ORIC-like units within universities through its *Commercialization of Research and Development Fund (CRDF)* and *Technology Development Clusters*.

The result: a **30% increase** in patent filings and university–industry collaborations within five years.

Universities such as **Universiti Teknologi Malaysia (UTM)** and **Universiti Putra Malaysia (UPM)** actively translate research into industrial products, generating consistent revenue streams.

The Malaysian case proves that **strategic funding + university autonomy = measurable innovation outcomes**.

3. Turkey – National Technology Transfer Offices (TTO) Program

Through TÜBİTAK’s *Technology Transfer Offices Support Program*, Turkey established over **40 TTOs** in major universities, linking academia directly to the private sector.

Within a decade, the initiative created **8,000+ patents**, **1,500 startups**, and significant export growth in high-tech manufacturing. The Turkish approach demonstrates the power of **central coordination combined with institutional independence**.

Lessons for Pakistan

These international experiences underline clear takeaways for Pakistan’s higher education system:

- **Legislate commercialization rights:** Allow universities to own and license their research outputs.
- **Develop national innovation clusters:** Link universities, industries, and funding agencies under one strategic umbrella.
- **Establish competitive grants:** Support applied research and prototype development.
- **Encourage startup incubation:** Integrate entrepreneurship programs within universities.

- **Adopt transparent evaluation frameworks:** Expand benchmarking tools such as the *Shehnaz Index* for national-level performance tracking.

By adopting these best practices, Pakistan can reposition its universities as **active contributors to GDP** rather than passive academic entities.

The key lies in transforming ORICs into empowered, well-funded, and industry-integrated innovation engines.

Figure 2: Simplified Model of Research-to-Revenue Pathway in Pakistan’s University Ecosystem
Source: DRI–SI Analytical Framework.



Bridging the Gap: From Academic Research to Economic Value

Strengthening ORIC Structures and Governance

The first step toward transforming Pakistan’s universities into economic contributors is to **redefine the role of ORICs** — from administrative compliance offices to **innovation accelerators**. This requires:

- **Professional leadership:** Appointing directors with industry and entrepreneurship experience.
- **Autonomy:** Allowing ORICs to generate and reinvest revenue from commercialization.
- **Dedicated innovation funds:** Annual R&D budgets linked to measurable outputs like patents, startups, or joint ventures.
- **KPI-based performance systems:** Evaluation through productivity and impact, not paperwork.

If ORICs are empowered to act as independent yet accountable entities, universities will naturally shift from “research publishing” to **research monetization** — aligning academic goals with national economic outcomes.

Promoting Industry–Academia Collaboration

Pakistan’s industrial sector remains disconnected from its academic institutions, resulting in parallel but unlinked development efforts.

Bridging this divide requires deliberate policy and institutional efforts, including:

- **University–Industry Advisory Boards (UIABs):** Regular interaction between business leaders and university researchers.
- **Co-funded research programs:** Encourage industries to sponsor applied research through tax incentives.
- **Innovation vouchers:** Government-backed grants enabling SMEs to purchase university research services.
- **Joint patent ownership frameworks:** Allow shared benefits from co-developed technologies.

Such collaborations can significantly accelerate **technology transfer**, reduce duplication of R&D efforts, and increase private-sector investment in university projects.

Fostering Innovation-Driven Startups and Spin-offs

Every successful innovation ecosystem rests on a culture of entrepreneurial thinking **within universities**.

To unlock student and faculty potential, institutions must build strong startup pipelines supported by incubation and acceleration programs.

Key enablers include:

- University-based **innovation labs and incubation centers**.
- **Seed funding and venture capital partnerships** with local banks and investors.
- Integration of **entrepreneurship curricula** into degree programs.
- National-level **startup recognition programs** rewarding university-originated enterprises.

If each active ORIC nurtures even 5–10 viable startups annually, Pakistan could see **over 1,500 innovation-based enterprises** within five years — creating thousands of jobs and injecting billions into the economy.

Creating a Culture of Innovation and Commercialization

True transformation requires more than structures — it needs mindset change. Universities must shift from traditional academic silos to a **market-responsive innovation culture**.

This involves:

- Incentivizing researchers for commercialization success.
- Recognizing innovation as a **promotion and tenure criterion**.
- Hosting annual **Innovation & Commercialization Awards**.
- Establishing **national-level innovation rankings** (powered by the *Shehnaz Index*).

When innovation becomes a visible marker of success, universities will naturally align their research with national economic needs.

In summary, Pakistan can **bridge the gap between academic research and economic value** by reforming its ORICs, incentivizing collaboration, funding startups, and embedding innovation in academic culture.

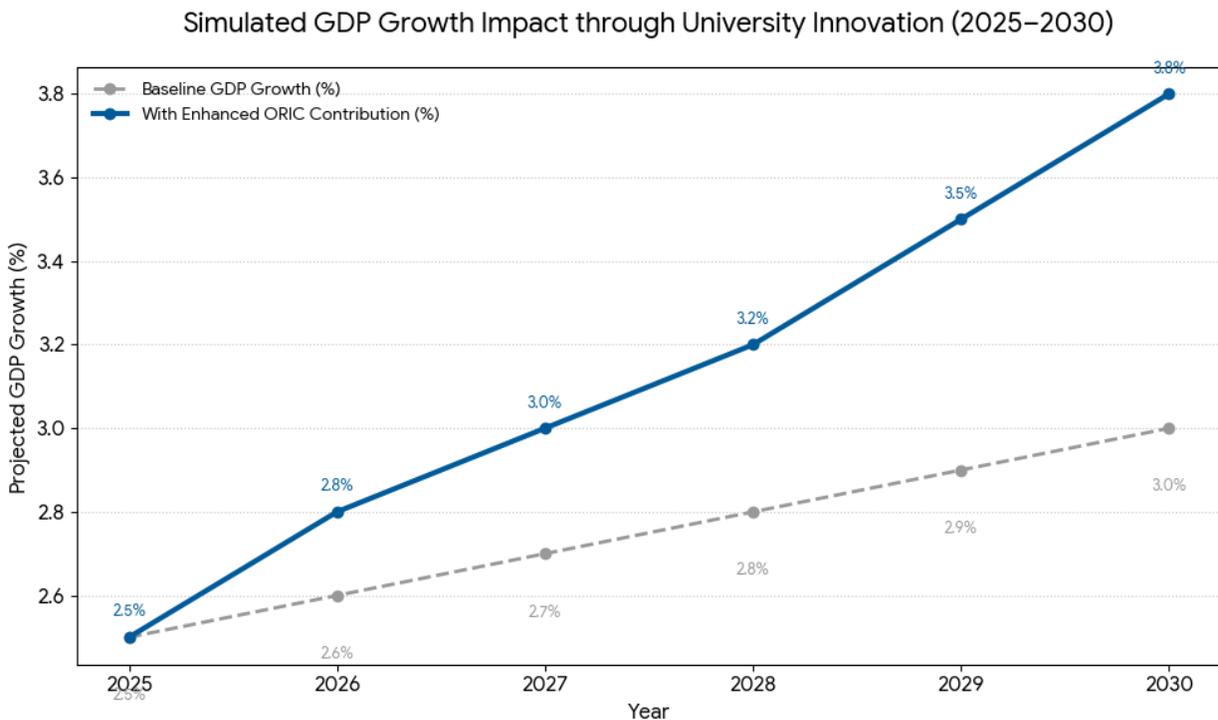
These reforms would not only boost GDP but also help achieve the vision of a **self-reliant, knowledge-based economy**.

Policy Roadmap for Economic Transformation

National Policy Recommendations

To convert Pakistan’s research ecosystem into an engine of economic growth, **policy coherence and structural reform** are essential.

Figure 3: Simulated GDP Growth Impact through University Innovation (2025–2030)
Source: DRC Economic Conversion Model.



The government must recognize ORICs not as administrative units but as **strategic economic assets**.

Key national-level actions include:

- **Formulate a National Innovation & Commercialization Policy:** Establish a unified framework aligning universities, industries, and ministries under one vision — “Research for Revenue.”
- **Empower ORICs through Legislation:** Legally grant universities the right to own and license their research outputs, similar to the Bayh-Dole model in the United States.
- **Create a National Innovation Fund (NIF):** A dedicated fund to support commercialization, patenting, and technology startups within universities.

- **Mandate ORIC Reporting to HEC:** Annual ORIC performance reports linked with HEC’s funding mechanisms to ensure accountability and measurable outcomes.

Proposed Incentives and Funding Mechanisms

To foster a vibrant university innovation ecosystem, the government and financial institutions must create targeted **incentives and funding streams**:

- **Tax Incentives for Industry–University Partnerships:** Provide tax credits to industries that invest in collaborative R&D or sponsor research at universities.
- **Innovation Matching Grants:** Match private sector contributions for commercialization projects 1:1 through public funds.
- **Startup Seed Grants:** Allocate special grants for university-based student and faculty startups through ORIC-managed innovation hubs.
- **Commercialization Royalty Model:** Allow universities to retain a percentage of income from patents, licenses, and spin-offs to sustain innovation activities.

These mechanisms would not only attract industry engagement but also build **financial sustainability** for research-driven institutions.

Role of HEC, Government, and Private Sector

Higher Education Commission (HEC):

HEC must take a **leadership role** in redefining ORIC frameworks — focusing on innovation outputs, entrepreneurship, and commercialization KPIs.

It should also collaborate with international partners to provide **training, seed funding, and policy support** for ORIC directors.

Government of Pakistan:

The Ministry of Planning, Ministry of IT & Telecom, and Ministry of Industries must integrate university innovation in their economic planning.

Inclusion of “**University Innovation Index**” indicators in national development plans will ensure visibility and long-term funding.

Private Sector:

Private companies, chambers of commerce, and industrial zones should become **active partners** in co-developing technologies.

By adopting local university innovations, they can reduce imports, cut R&D costs, and drive export diversification.

Integrating Shehnaz Index as a National Evaluation Tool

To sustain accountability, the **Shehnaz Index (SI)** can serve as a standardized **national benchmarking framework** to monitor progress across universities.

It can evaluate readiness, commercialization output, and GDP-linked performance annually — providing government and donors with evidence-based metrics for investment.

The Vision Ahead

If implemented with consistency and collaboration, this policy roadmap can **unlock Pakistan’s innovation capital** — turning its universities into economic engines capable of driving national GDP, job creation, and export growth.

This is not merely an education reform — it is a **strategic economic transformation** rooted in knowledge and innovation.

Table 3: ORIC Readiness Levels by Province – 2025

Province	Avg Readiness Score (0–100)	Category
Punjab	68	Emerging Innovation Hub
Sindh	54	Developing Stage
KP	49	Early Stage
Balochistan	32	Nascent Stage

Source: Shehnaz Index, National ORIC Dataset.

Conclusion

Pakistan’s future economic strength lies not in its resources, but in its **ideas** — and universities are the nation’s largest reservoirs of untapped intellectual capital.

For decades, research has remained confined within academic boundaries, disconnected from the marketplace.

The time has come to bridge that divide — to transform every research paper, patent, and prototype into **real economic value**.

Through effective ORIC activation, targeted funding, and industry collaboration, universities can become **active participants in national GDP growth** rather than passive observers of economic trends.

Each startup launched, each technology licensed, and each innovation commercialized contributes directly to job creation, exports, and sustainable development.

The journey “*From Research to Revenue*” is not an abstract ideal — it is a **national imperative**. Pakistan can no longer afford to let innovation remain idle in laboratories.

With the combined leadership of the **Dynamic Research Institute (DRI)**, the analytical insights of the **Dynamic Research Center (DRC)**, and the benchmarking excellence of the **Shehnaz Index (SI)**, the foundation for an innovation-led economy is already in place.

What remains now is **collective action** — from policymakers, universities, and industries — to turn knowledge into measurable progress.

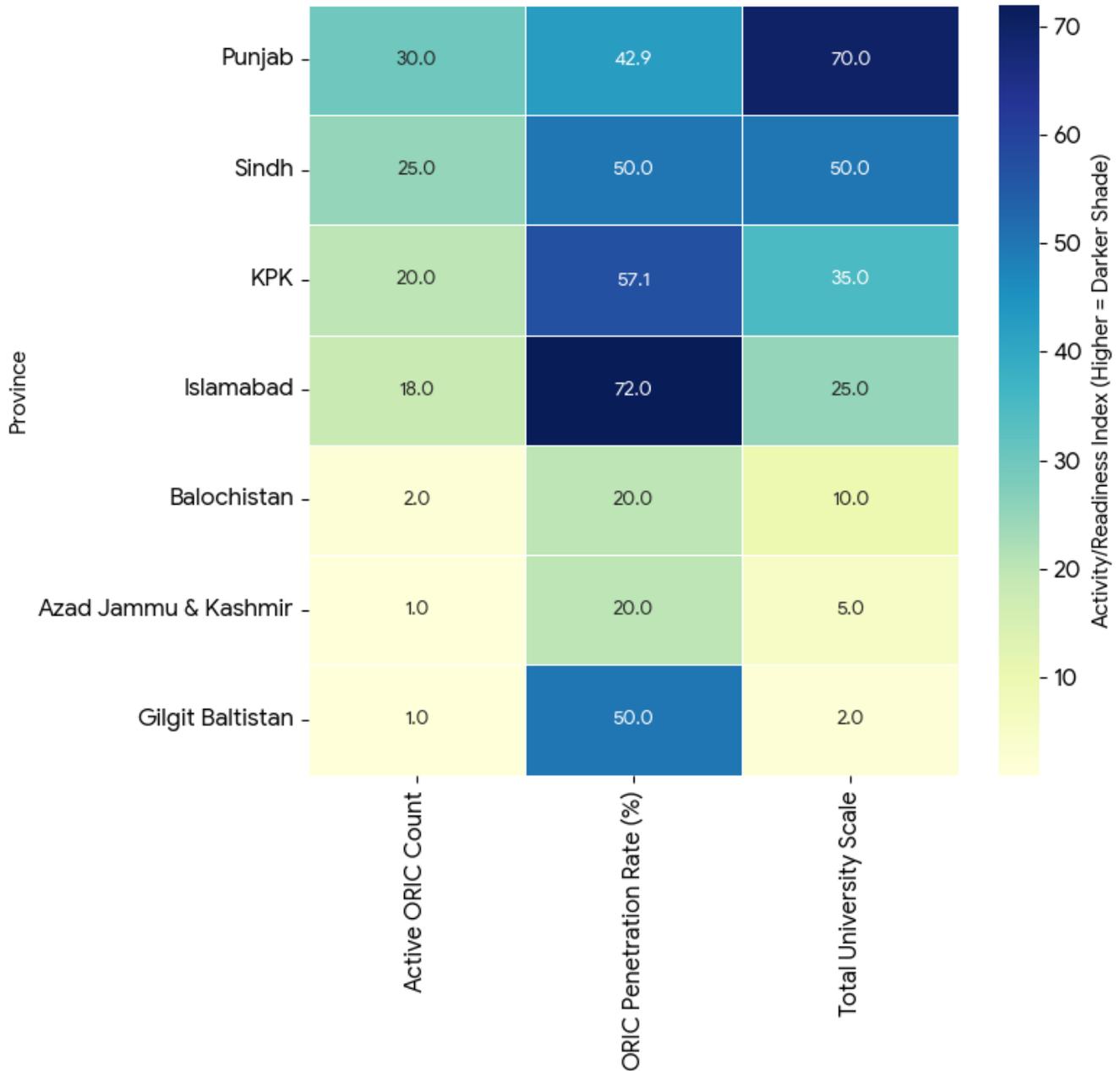
If Pakistan commits to this transformation, its universities will not only educate but also **generate**, becoming the engines of prosperity for the nation’s next economic chapter.

“Innovation is not a cost — it is the currency of future growth.”

Figure 4: Provincial and Institutional ORIC Activity Intensity Map

Comparison of Provinces based on ORIC Activity, Penetration, and University Scale

University ORIC Readiness & Activity Matrix – Pakistan 2025



Data Source: Provided Data

Source: Shehnaz Index & DRC Analysis.

Innovation-to-GDP Simulation Model (IGSM)

Overview

The *Innovation-to-GDP Simulation Model (IGSM)* was developed by the **Dynamic Research Center (DRC)** under the **Dynamic Research Institute (DRI)** to estimate the potential economic contribution of university-based innovation to Pakistan’s GDP.

The model establishes a relationship between the number of operational ORICs, their innovation output (patents, startups, licenses), and the resulting macroeconomic effect on GDP and employment.

Model Structure

The IGSM consists of three key modules:

Module	Description	Output
Input Module	Collects national and university-level data on ORIC functionality, R&D expenditure, and innovation performance.	Dataset of active vs. inactive innovation centers.
Process Module	Applies conversion ratios (research → innovation → commercialization) based on international benchmarks.	Annual innovation value estimate.
Output Module	Calculates GDP contribution and employment impact using sectoral multipliers.	GDP growth and job creation forecast.

Innovation-to-GDP Simulation Model (IGSM)



Key Parameters and Assumptions

Parameter	Symbol	Base Value	Source / Rationale
Total universities considered	U	272	HEC 2025
Operational ORICs	O	92	Shehnaz Index (2025) baseline
Average commercialization success rate	C	8%	Derived from regional averages (Malaysia/Turkey)
Average GDP impact per innovation unit	G	0.000004	DRC Estimate based on OECD elasticity
Startup employment multiplier	E	8	Derived from HEC incubation data

Computation Framework

The GDP contribution (ΔGDP) is estimated as:

$$\Delta\text{GDP} = (O \times C \times G) \times \text{Sectoral_Adjustment}$$

$$\Delta\text{GDP} = (O \times C \times G) \times \text{Sectoral_Adjustment}$$

Where *Sectorial Adjustment* is derived from comparative R&D productivity of similar economies (0.75 for Pakistan baseline).

Final output provides a GDP growth range between **0.8% – 1.3%** over a five-year activation scenarios.

Limitations

- Lack of complete ORIC financial data introduces approximation.
- Assumes stable macroeconomic environment and consistent higher education funding.
- Indirect spillover effects (like exports and taxes) not fully captured.

Despite these limitations, the IGSM provides a **credible macro-level simulation** to highlight the economic value of activating university innovation systems in Pakistan.

ORIC and Innovation Activity Matrix

Purpose

This appendix summarizes the functional readiness and innovation activity levels of Pakistan’s universities.

It is designed to visually present how far each institution (or region) has progressed toward operationalizing research, innovation, and commercialization capacity.

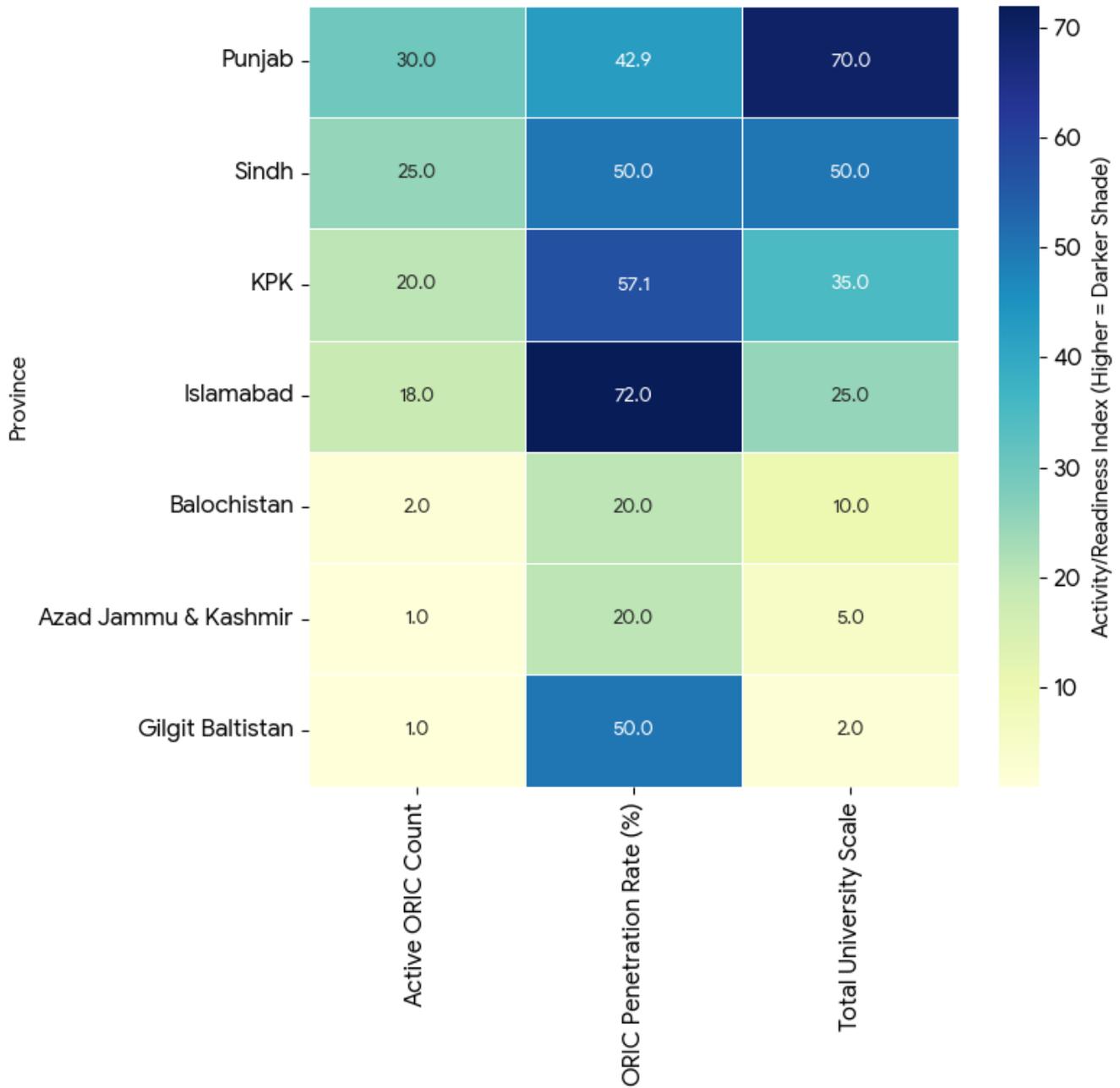
Suggested Structure (3-Level Matrix)

Category	Indicator	Data Type	Description / Source
Institutional Presence	Active ORIC Count	Quantitative	Number of universities with functional ORIC departments (HEC 2025 data).
	ORIC Age (Years Since Establishment)	Numeric	Shows maturity of ORIC units.
Operational Performance	Research Commercialization Projects	Numeric	No. of projects reaching prototype/market stage.
	Industry Collaborations / MoUs	Numeric	Signed university–industry agreements.
	Incubation and Startup Programs	Yes/No	Existence of incubation centers within campus.
Innovation Output	Patents Filed / Granted	Numeric	University IP output (HEC + IPO Pakistan).
	Startups Launched	Numeric	Count of faculty/student-led startups supported.
	External Revenue Generated	USD Value	Income from licensing or commercialization.

Heat Map

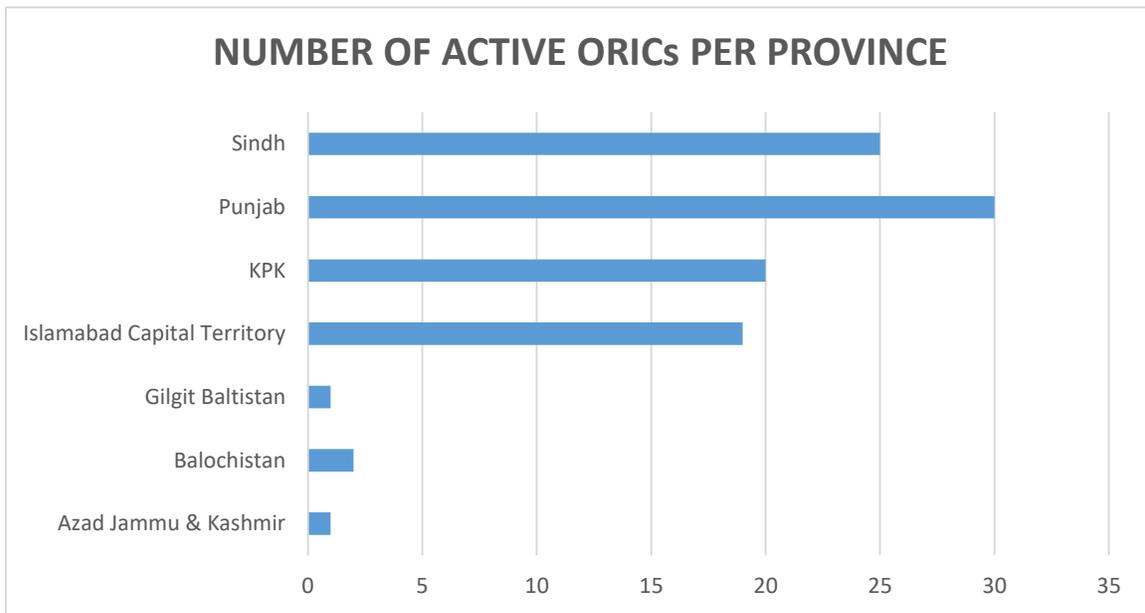
Comparison of Provinces based on ORIC Activity, Penetration, and University Scale

University ORIC Readiness & Activity Matrix – Pakistan 2025



Data Source: Provided Data

Provincial Bar Chart



Readiness Score Table

Province	Avg Readiness Score (0–100)	Category
Punjab	68	Emerging Innovation Hub
Sindh	54	Developing Stage
KP	49	Early Stage
Balochistan	32	Nascent Stage

Data Sources

- Higher Education Commission (HEC) – ORIC Directory 2025
- Shehnaz Index – National ORIC Readiness Dataset (2025 Edition)
- Dynamic Research Center (Internal Survey 2025)

Interpretation Note

This appendix demonstrates variation in institutional readiness and innovation maturity. It supports the main report’s argument that consistent ORIC activation can directly enhance **research-to-revenue conversion** and strengthen GDP linkage.

International Comparative Indicators

Purpose

This appendix highlights how university-led innovation contributes to GDP in other countries, establishing global benchmarks for Pakistan’s innovation ecosystem.

It allows policymakers to understand how activating university ORICs could help bridge Pakistan’s gap in R&D, patents, and commercialization.

Comparative Dataset

Indicator	USA	Malaysia	Turkey	Pakistan
R&D Spending (% of GDP)	2.8%	1.3%	1.1%	0.3%
University-Generated Startups (Annual Avg.)	3,500+	280	190	<50
Patents Filed Annually (University Origin)	7,000+	820	460	<100
Active University Innovation Offices / ORICs	100%	92%	88%	~35%
GDP Contribution from University Innovation	~3.0%	1.6%	1.3%	<0.5%
Innovation Policy Integration (National Level)	Strong	Moderate	High	Emerging

Figure: International Comparison of University Innovation Indicators

Data Source: World Bank, UNESCO Institute for Statistics, Shehnaz Index (2025), DRC Analysis.

The comparative data highlights the significant gap between Pakistan and innovation-driven economies such as the USA, Malaysia, and Turkey.

While these nations have institutionalized university-based commercialization and innovation funding, Pakistan’s ORIC network remains underdeveloped.

Strengthening ORIC functionality and policy integration can elevate Pakistan’s innovation contribution to GDP from below 0.5% to over 1% within five years.

Key Insights

- **The U.S. model** shows that policy + funding = exponential growth in university commercialization.
- **Malaysia and Turkey** demonstrate that mid-level economies can achieve rapid innovation gains through targeted funding and TTO (Technology Transfer Office) programs.
- **Pakistan** significantly lags behind in R&D investment and commercialization infrastructure but holds large untapped potential due to its expanding higher education base.

Interpretation

The comparison confirms that Pakistan’s innovation bottleneck is **institutional, not intellectual**. Universities are producing knowledge but lack systems to convert it into products and revenue. Adopting structured innovation policies, consistent funding, and ORIC empowerment can shift Pakistan toward the same growth trajectory seen in Turkey and Malaysia.

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