

Extractivism as an obstacle to innovation and technology transfer: The case of Algeria

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| IN SHORT

EN

- The paper analyzes the lack of cooperation between universities and companies in Algeria.
- There is a lack of incentives for knowledge transfer between academia and industry.
- University research in Algeria is insufficiently focused on the needs of industry.
- Limited financial resources and infrastructure are barriers to research and innovation.
- Algeria needs to improve university-industry collaboration and strengthen the research landscape.

DE

- Der Policy Brief beleuchtet die unzureichende Zusammenarbeit zwischen Hochschulen und Unternehmen in Algerien.
- Es fehlen Anreize für den Wissenstransfer zwischen Hochschulen und Industrie.
- Die universitäre Forschung in Algerien ist nicht ausreichend auf die Bedürfnisse der Industrie ausgerichtet.
- Begrenzte finanzielle Ressourcen und Infrastruktur sind Hindernisse für Forschung und Innovation.
- Algerien muss die Zusammenarbeit zwischen Hochschulen und Industrie intensivieren und die Forschungslandschaft stärken.

FR

- Ce document analyse le faible niveau de coopération entre les universités et les entreprises en Algérie.
- Il n'y a pas de mesures incitatives pour le transfert de connaissances entre le monde universitaire et l'industrie.
- La recherche universitaire en Algérie n'est pas suffisamment orientée vers les besoins de l'industrie.
- Les ressources financières et les infrastructures limitées constituent des obstacles à la recherche et à l'innovation.
- L'Algérie doit intensifier la collaboration entre l'université et l'industrie et renforcer le secteur de la recherche.

ES

- El documento analiza la falta de cooperación entre universidades y empresas en Argelia.
- Faltan incentivos para la transferencia de conocimientos entre el mundo académico y la industria.
- La investigación universitaria en Argelia no está suficientemente centrada en las necesidades de la industria.
- La limitación de los recursos financieros y de la infraestructura son obstáculos para la investigación y la innovación.
- Argelia necesita impulsar la colaboración entre la universidad y la industria y reforzar el panorama de la investigación.

Introduction

In the era of the knowledge-based economy, scientific research is considered an essential source of technological development. As such, public university research now represents a powerful leverage for technological development through the transformation of university research into technological products (Etzkowitz, 1998; Rosenberg, 2009).

Therefore, the public policies of countries and regions are henceforth interested in the means that should be mobilized to strengthen the links between universities and enterprises. Such policies analyze the results and the difficulties that arise from these changes. Since then, the valorization of research has become a very popular subject among innovation economists. They are particularly interested in the relationships between universities, public research centers and companies (Laperche 2003, Laperche and Uzunidis, 2011). Indeed, close collaboration between university and industry will allow companies to gain an international competitive advantage in innovation (D'Este, P., Perkmann, 2012).

In Algeria, university research is still limited and remains at a theoretical stage, which does not meet the needs expressed by the industrial sector. Moreover, the relations between the university and the enterprise in Algeria are disorganized. Instead of maintaining a cooperative and collaborative relationship, these actors venture into opposite courses.

In order to put research at the service of industry and to bring the university closer to enterprises, several reforms have been adopted in Algeria, aiming at the mobilization of university research for the sake of socio-economic development (law 98-11; law 08-05, law 15-21, law 2-02). However, these reforms did not lead, as

will be shown later, to the expected results. It is thus crucial to understand the origin of this deep-seated inability of the Algerian State to carry out several reforms which theoretically intended to make of the university an innovation incubator and of the companies a recipient of university research and technological transfer.

In academic works devoted to this question of disconnection between the university (public research) and enterprise in Algeria, the gap is generally explained by two major factors: (a) the weak links between research and industry in Algeria; (b) the issue of funding scientific research.

Our hypothesis is quite different; although these explanations are valid, they are nevertheless insufficient because they fall more into the category of observation than into that of proper analysis. In reality, it is the extractivist and rentier nature of the economy supported and maintained by the current political system that produces institutional forms (formal and informal) that stand in the way of innovation and technology transfer in Algeria.

Thus, after having exposed the explanations put forward by the various researchers on the question, we shall argue our assertion by emphasizing two main ideas; firstly, the market is not sufficiently developed to compel companies to be innovative through competition. Secondly, the university and research centers, as institutions, have been short of knowledge and power as to how to inscribe themselves in a historical perspective of transgression of the status that the authoritarian and rentier regime has assigned them.

Weaknesses of the relationships between research and industry in Algeria

According to numerous authors, despite the limited attempts made during the 1990s, collaboration between universities and enterprises remains slow to emerge in Algeria. Apart from a few cooperation and collaboration contracts between certain universities and public companies, there is a significant disconnection between public laboratories and companies. Algerian enterprises have been operating without R&D and the university

remains basically concerned with theoretical (fundamental) research (Khelfaoui, 1997; Djeflat, 2012).

The reasons behind this disconnection between the university and industry are related both to the university and to the enterprise (Saad 2008, 2017). On the university level, several reasons are at the root of such disconnection: the limited time devoted to research; the

direction of research towards academic rather than applied and industrial research, i.e. physics, chemistry, biology, computer science, geology and biochemistry; and the emphasis on research at the expense of technological development (Djefflat, 2012). On the business side, there is a low demand for university technologies by companies, the orientation of companies towards niches without technology and/or using the simplest techniques that have since long fallen into the public domain (Kheladi, 2016, 2017).

Entrepreneurs direct their investments towards sectors that do not require competition through research and innovation, such as construction and services (Djefflat, 2012; Kheladi, 2016, 2017).

Another possible justification is the lack of public and private funding for scientific research, and this explanation is often provided by international organizations.

On the issue of funding scientific research

The level of funding for scientific research is also a factor behind Algeria's poor technological performance. According to UNESCO statistics (2021), the rate of the research budget in Algeria did not exceed the threshold of 1% of GDP from 2000 to 2016 (Table below). According to OECD data (2022), Algeria's R&D expenditures represent 0.35% of GDP annually, which

equates to 35 million dollars in 2021. Algeria is far behind, Egypt with 1.2 billion dollars, and Tunisia with 50 million dollars. The objective to reach 1% of GDP, as announced in the science and technology policies in Algeria, remains well below average in emerging countries, which is around 1.5%.

Table 1: Percentage of the research budget in the GDP in Algeria¹

Years	2007	2008	2009	2010	2011	2012	2017
Research budget as % of GDP	0.10	0.60	0.94	0.66	0.63	0.14	0.54

Moreover, the private sector does not contribute to the financing of scientific research. This is shown by the UNESCO statistics on the intensity of enterprises' domestic expenditure on R&D. Thus, in terms of GERD financed by companies in 2017, the top of the ranking is held by Turkey, beating Egypt by 30.93 times, Algeria by 61.41 times and Tunisia by 78.99 times. In the MENA region, Algerian companies rank last. This is proven when we look at the GERD conducted by companies as a percentage of GDP in 2017, in which Algeria ranks last

behind all MENA countries. The top ranking are Turkish companies, ahead of Egyptian firms by 0.51%, Tunisian firms by 0.42%, and Algerian ones by 0.51%.

Regarding domestic R&D expenditure financed by companies in 2017, Algerian companies are outpaced by Turkish firms by 42.7% and those Tunisian by 12.2%.

¹ Source: Compiled by the author on the basis of UNESCO statistical data (2021)

Table 2: Intensity of domestic R&D spending by companies (Ranking out of 167 countries, in 2021)²

Countries	GERD financed by companies in 2017 (in thousands of current PPP)	GERD conducted by companies as a % of GDP in 2017	% of GERD financed by companies in 2017	% of GERD conducted by companies in 2017
Turkey	10 752 029.06	0.54	49.44	56.87
Qatar	166 415.28	0.06	09.25	12.15
Egypt	347 606.74	0.03	04.81	04.90
Jordan	ND	ND	ND	ND
Morocco	ND	ND	ND	ND
Tunisia	136 114.93	0.12	18.94	18.50
Algeria	175 061.05	0.03	06.74	06.70

In the MENA region, Algerian and Egyptian companies are at the lower of the scale. The same finding can be observed in relation to the percentage of GERD carried out by companies in 2017, in which Algerian companies are found in the last position together with Egyptian firms. Algerian companies are outranked by Turkish companies by 50.17% and also by Tunisian ones by 11.8%.

These analyses, all of which are relevant, seem to be highly inadequate. The explanation is that they are tainted with an unfortunate tradition of research, particularly in economics, which is intended to be "neutral" and restricted to a type of demonstration exclusively embedded in statistics. As a result, this tradition overlooks a large part of the reality of concrete factual analysis.

| The rentier and extractive nature as a global explanation for the weakness of innovation and technology transfer

The problem of innovation and technology transfer involves four institutions: the market, the State, companies and universities.

The market imposes its own logic through competition. Faced with the pressure of national and international competition, companies resort to innovation and the search for technological transfers in order to achieve a level of profitability that ensures their market share. They finance research and establish links with the university. The State coordinates, directs and frames this process through public policies of scientific research. The financing of scientific research is naturally

joint: public/private. The shares of each vary from one country to another.

This briefly presented scheme is invalid, if not weakly articulated in a rentier state like Algeria.

The source of wealth in Algeria comes from the sale of hydrocarbons on the international market (97% of the State's foreign exchange earnings). This situation means that the national market is not sufficiently developed to impose its forms of regulation. It is, therefore, not competitive. Without the pressure of competition, companies are not prone to invest in the production of

² Source: Compiled by the author on the basis of UNESCO's statistical data (2021)

manufactured goods or to innovate. Instead, these companies are more interested in easy gains and quick returns on investment, in a word, in rent-seeking rather than in the creation of added value. Indeed, according to the statistics of the Ministry of Industry and Mines, the weight of the industrial SME in the total population of SMEs in Algeria is insignificant. The percentage of the industrial SME has not surpassed the threshold of 10% of the total population of SMEs during the decade 2010-2019.³ Moreover, the few companies that are part of the industrial sector in Algeria are content with simple transformations: processing of imported milk powder into milk and yoghurt, processing of wheat into flour, processing of flour into pasta, bottling of water and other beverages. These are basic products subsidized by the State.

As for public enterprises, most of them have been in deficit since the 1970s and have been living off the money from the public treasury.⁴ They are not enterprises in the proper sense of the term, they are administrative entities in charge of economic issues (L. ADDI, 1990).

With regard to universities and research centers, the other main actors of innovation, it should be emphasized that the university in countries governed by authoritarian regimes is not conceived as a place for the production of ideas and knowledge, but rather as an administrative entity in charge of producing "scientific" justifications for the political decisions that have already been taken. The university is neither autonomous nor productive. This lack of autonomy is reflected in the sterility of scientific production, the brain drain in all its forms and a discounted teaching.⁵ This state of affairs by itself explains the university's lack of interest in innovative scientific research and its weak links with the business world and companies.

Let us now get back to the question of the weak funding of scientific research. We have previously explained that the political and economic environment, in which the Algerian enterprise and university evolve, does not encourage either of them to invest in research

and development. This explains the nearly total absence of private funding of scientific research. Another factor that makes almost impossible the non-public financing of scientific research is the heavy and rigid regulations in force. As to public funding, it is not only weak, as noted above, but also centralized and granted in a clientelist and discretionary manner. The approval of research projects is based more on proximity to administrative (and therefore political) personnel than on the content itself.

On a rational plane, it is quite legitimate to wonder why a State stands as an obstacle to the emergence of a competitive market that encourages companies to innovate and the university to respond to this demand. Moreover, why aren't the "floodgates" of public and private funding open to the creation of a national production tool to cope with international competition? This problematic necessarily leads us to examine the nature of the Algerian State along with the articulation between the political and the economic processes that it imposes.

Algeria gained independence on July 3, 1962, after 132 years of colonization and a long and brutal war of liberation. The conduct of warfare was undertaken by a single party, namely the FLN. From its birth, the FLN proclaimed itself the sole legitimate representative of the Algerian people. It mobilized the entire society against colonial presence. Following the example of nationalist liberation parties and movements, the FLN was not a political party in the classical sense of the term, nor was it a unified front. It positioned itself as the defender of the whole community against colonial order. The political forces that made up the FLN came from a variety of backgrounds, but the leaders of the FLN during the war did not deem it necessary to develop a political program or a social project for independent Algeria. However, once independence was gained, the implications of this situation represented a powerful impediment to the political and economic development of society. In this regard, it is worth recalling this very significant reflection by Mohammed Harbi when he states that: *"It is certainly a bit pointless to wonder how*

³ Ministry of Industry and Mines (2019), SME Statistical Information Bulletin, No. 35, 1st half of 2019.

⁴ One might ask why the State maintains an economic public sector, which is otherwise dominant, although it has been in deficit for decades. In fact, the public sector in Algeria is a channel for the distribution of rent. It may be well to ask, in

view of this knowledge, whether the attribute "public" is adequate because it is an anti-public sector. Actually, it is a waste of public money.

⁵ *Université désacralisée, recul de l'éthique et explosion de la violence* (2022), Koukou éditions, Alger.

things would have happened if the FLN, while sticking to the armed struggle, had opted for another procedure of unification of political forces. But the question is worth asking, because the motto 'action first' will become 'army first' " as Harbi puts it.⁶ Starting from there, the privatization of the state in gestation and especially its militarization was initiated. This explains the choice of the single party model and the centralized planning system adopted after the Independence until 1988 as well as the failure of the multiple political and economic reforms carried out since then.

The notion of State privatization or patrimonialization refers to a historical situation where one group (or more) of individuals invests the State, monopolizes the political field and thus prohibits the competition for

Conclusion

The institutional framework proves to be at the origin of the disconnection observed between the actors of the innovation system in Algeria. The fact that if R&D initiatives in Algeria have remained largely distant from industrial practice is due to the absence of institutional mechanisms that facilitate interactive links between universities (or research centers), industry and regulatory institutions. After firms, it is the R&D actors who have been the most impacted by the enforced institutional framework.

The institutions stemming from the rentier economy have kept economic actors dependent on oil rents. This is the reason why the majority of companies have deserted the sectors requiring competition through research and innovation (filing patents, doing R&D, recruiting researchers, exporting high-tech products, introducing new products issuing from university research on the market). Instead, these enterprises concentrate in sectors that do not use technology, such as trade and construction to benefit from the oil rent. The rentier economy has neutralized the real actors of industrial innovation, those who can impact the technological performance of Algeria.

power by claiming to be the only legitimate representative of "the community". The State becomes a semi-private patrimony at the service of a power whose political and economic action has no other objective than that of lasting longer, regardless of the cost. Economic resources, in this case, become an essential element in the political process. As a result, the Algerian political regime cannot cope with political liberalism, nor can it do so with the market economy. It is in these terms that it stands as an obstacle to the emergence of a productive economy in which economic agents invest in innovation and research as well as development.

Without efficient institutions, the innovation system is doomed to failure. "What is also needed is an environment that stimulates innovation and growth rather than rentier activities. Far-reaching institutional reforms are needed to ensure the emergence of the environment in which the opportunities generated by liberalization and other structural transformations can stimulate growth" (Byrd, 2003; p.69).

To make up for the delay that Algeria is experiencing in terms of innovation and technological development, Algeria must introduce technological institutions of mediation between the enterprise and the university, that is, financial institutions of venture capital. However, these challenges are dependent on the standard of the rationality that governs the global political and economic model which is dependent on the quality of the institutions that make it up. Indeed, as D. North (2003) rightly points out, "*the organizations that are formed will reflect the opportunities created by the institutional matrix. If the institutional framework rewards piracy, pirate organizations will be created; if it rewards productive activities, organizations (or firms) will be created to undertake productive activities.*"

⁶ Harbi, Mohammed, (1994), *L'Algérie et son destin croyants ou citoyens*, Medias éditions, Alger, p. 93.

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EXTRACTIVISM

| The Project

The collaborative research project ***extractivism.de*** links the Universities of Kassel and Marburg. The project scrutinizes the extractivist development model and proposes new economic, political, and sociological conceptions of extractivism. It preliminarily focuses on Latin America and the Maghreb patterns. The project researches the conditions under which these patterns affect the persistence and transformative capacity of extractivism and its respective institutional settings. Finally, it explores how extractivism affects cultural processes and habitual routines and questions under what conditions and how far the development model extends into institution-building and social practice, i.e., everyday life.

The project aims to understand extractive societies not as deviants from the Western trajectory of development but in their own logic and their own particularities. The project, therefore, combines a strong empirical focus with theoretical work. It links both broad field research and data gathering of primary data and the qualitative and quantitative analysis of available secondary sources with a stringent transregional comparison. It develops methods in cross-area studies and investigates whether and why similar patterns of social change emerge in different areas and world regions despite significant cultural, social, or religious differences. Finally, the project intends to translate the findings for politics, society, and development cooperation.

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