



ARE JORDAN AND TUNISIA'S EXPORTS BECOMING MORE TECHNOLOGICALLY SOPHISTICATED? AND WHY IT MATTERS

*Ndiame Diop and Sofiane Ghali*¹

Introduction: The last decade has witnessed two interesting features in international trade. First, high-tech products have become the fastest growing segment of international trade. Second, developing countries are increasingly becoming exporters of high-tech products thanks to greater trade openness, greater ability to master and use technologies, and a rise in Foreign Direct Investments (WTO 2009). With the globalization of production processes and the important investments in science and technology in rich countries, knowledge and technology spillovers have dramatically increased the opportunities for developing countries to specialize in niches within high-tech sectors. This is particularly true for countries geographically close to the global sources of innovation, are open to trade and investments, and have a good human capital base (Keller 2004, Klenow and Rodriguez-Clare 2005 and Howitt 2000).

But why should developing countries improve the quality of products exported? There is evidence that what you export matters for growth, employment, and the magnitude of spillover effects to the rest of the economy². Low technology products tend to

grow the slowest and technology-intensive products the fastest (Lall 2000). To the extent that technology-intensive sectors are more productive, a movement of resources into these sectors enhances productivity and competitiveness.

The objective of this paper is to pinpoint the changes in Jordan and Tunisia's production and export structures over the last decade or so. We use two highly disaggregated panel export database (products captured at the 11-digit level) and a "product-based" methodology that allows a mapping of products classified by technological content and their sector of origin. The database used runs from 2003 to 2010 for Jordan and from 1995 to 2009 for Tunisia, providing a pseudo-panel structure.

Why Jordan and Tunisia? The choice of Jordan and Tunisia is, by no means, an accident. First, these countries are among the few countries of the region well integrated to the global manufacturing markets. FDI stood at 11 percent of GDP in Jordan and 4 percent of GDP in Tunisia, and exports/ GDP stood at 49 percent in both countries in 2010. Second, Jordan and Tunisia have a strong human capital base, a large number of engineers, a substantial high-skill diaspora and an IT-savvy young generation attuned to innovation. Both countries also struggle with a very high level of unemployment for the educated and skilled. The unemployment rate for university graduates is around 20 percent in Jordan and 30 percent in Tunisia and the unemployment rate is inversely proportional to the level of education. Thus expanding the skill and technology-intensive sectors is likely to enlarge the scope for reducing

¹ Ndiame Diop, World Bank and Sofiane Ghali, University of Tunis. This Quick Note is based on the authors' paper: "Are Jordan and Tunisia's Exports Become More Technologically Sophisticated: Analysis Using Highly Disaggregated Export Databases, forthcoming in MENA Working Paper Series N.54. The Quick Note was cleared by Manuela Ferro, Sector Director, Poverty Reduction & Economic Management Department (MNSPR), The Middle East and North Africa Region, The World Bank. .

² See for instance, Hausman, Hwang and Rodrik (2007)

unemployment of the educated youth. At the same time, expansion of these sectors is likely to boost productivity and growth in a virtuous cycle.

Historical Evolution: Interestingly, the current export structure of Jordan and Tunisia reflects a contrasting evolution over the last decade or so, with Tunisia slowly but steadily moving up the technological ladder from a very low basis, while Jordan saw a steep rise in low-tech exports overtime. In Tunisia, since 2004, excluding the global crisis year 2009, the share of medium and high tech exports has increased steadily while exports of low-tech products have declined significantly as a percentage of total exports -from 56.7 percent in 1995 to 38.3 percent in 2009. This decline gave way to a slow rise in the export of products classified as medium-low tech (from 6.1 to 11.2 percent of total exports), medium-high (17.4 to 30 percent) and high-tech (1.8 to 6.5 percent). In Jordan, the share of low and medium-low tech exports increased dramatically since 2003, overshadowing the relative resistance of high and medium-tech in the entire period. The share of low-tech exports almost doubled between 2003 and 2006 when it reached its peak (43 percent) while medium-low tech export share increased steadily from 5 to 17 percent between 2003 and 2010.

Drilling down, it appears that the contracting evolution of Jordan and Tunisia's export structure is the result of the dynamics of a few products. For example, the rise of low-tech exports in Jordan and the decline of that category in Tunisia are driven by textiles and textile products, which dominate low-tech exports in both countries. In Tunisia, the share of textiles and textiles products in total exports dropped by almost half, from 44 to 24 percent whereas Jordan saw a steady increase in the share of this product category, from 10 to 18 percent between 2003 and 2010.

The Tunisian Experience: In Tunisia, textiles and textile products became the largest export sector following the creation of an "offshore" investment regime in 1971 and the subsequent participation to EU textile production networks. Tunisia's offshore regime features generous investment incentives granted to exporters—duty-free tariffs on imported raw materials and equipments, freedom of investment, tax holiday, etc. It has triggered significant growth in FDI from EU companies and in

exports of textile products. The share of textiles and clothing in exports rose from 18 percent in 1980 to 44 percent in 1995, before dropping gradually to 33 percent in 2006 and 24 percent in 2009. The rise and relative decline of textiles and clothing illustrates two successive structural transformations in Tunisia's manufacturing sector since the 1970s: (i) a period of rapid diversification away from fuel exports which dropped from 52 percent in 1980 to 13 percent in 2006 and; (ii) a gradual diversification away from low value added textiles and clothing towards light mechanical and electrical manufacturing which now dominates exports.

The second structural transformation warrants some elaboration since it is one of the main drivers of the rise in medium tech exports observed over the last decade or so. Indeed, in the mid-1990s, Tunisia abandoned its ambition to build "made in Tunisia" cars and focused on automobile parts and components, in which the country has developed real expertise over the years. The "local content" partnerships built with EU automakers rapidly led to increased participation to EU automobile production networks (France, Italy and Germany mainly) and a double digit growth in exports of engineering and electrical machineries since 1997. As of 2010, this category has overtaken textiles and clothing as Tunisia's largest export sector, accounting for 30 percent of total exports (against 9 percent in 1995). Products in this broad category also classified as "machinery and transport" include: electrical wiring systems, electrical motors and generators, wheels and rubber tires, plastic auto components as well as various mechanical auto parts. The electrical wiring system is by far the largest and most dynamic sub-sector. Tunisia is now among Europe's top 10 suppliers of electrical wiring systems and the country's global market share in this segment is about 2.2 percent (World Bank 2008).

Jordan's Evolution: The rise of textiles and clothing in Jordan was also driven by privileges granted to exporters and greater market access. The Qualifying Industrial Zone agreement signed with the US gave Jordanian exports quota-free and duty-free access to the U.S. market under advantageous rules of origin. Thanks to these incentives, investments in the sector skyrocketed and Jordan's apparel and textile exports rose dramatically from US\$50 million per year before 1999 to US\$1 billion in 2010. As everywhere around the world, the textile and clothing industry

is a significant and cost-effective source of low-skill employment, as it is labor-intensive and does not require heavy investment in assets. In contrast with Tunisia however, most of the 60,000 workers in this sector in Jordan are foreigners.³ Although the sector's competitiveness has diminished following the abolition of quotas on China and other large exporters within the framework of the Multi-Fiber Agreement, it remains an important sector for the economy. A key objective for both Tunisia and Jordan is to move up the value chain in textiles and exit gradually the lower end of this sector where competition with lower cost producers is stiff.

Current Structure of High Tech Exports: In *Jordan*, high tech exports are driven almost exclusively (98.6 percent) by pharmaceutical products. Jordan's pharmaceutical sector features high value-addition for the economy, with strong links to local input markets (packaging, material capsules, technology, research, etc.) and an ability to add real or perceived value to the products through branding. High quality products are exported to more than 60 markets worldwide, which attests to their competitiveness, particularly with regard to brand generic drugs (Jordan Vision 2020). The development of the sector was fuelled by specific strategies implemented by individual companies, which include: (i) US Food and Drug Administration's certification; (ii) research on product manufacture for drugs which are nearing their patent expiration exploiting loopholes in the Free Trade Agreements signed with the US and the EU in the early 2000s. These agreements provide Jordanian pharmaceutical companies with first mover advantage in marketing generic drugs compared to international (European and American) pharmaceutical companies;⁴ (iii) signature of the Intellectual Property Rights (IPR) and WTO agreements which increased the confidence of multinational drug companies in Jordan and resulted in the establishment of several strategic

³ In Tunisia, the sector employs about 240,000 workers, all Tunisians.

⁴ European Union legislation prohibits European companies from undertaking generic product preparation (R&D) prior to patent expiry. Jordanian companies are unaffected by this legislation and have exploited this loophole to develop first mover advantage in the generic market for drugs which have recently come off patent. The US has removed such a loophole. The EU may close this loophole in its FTA with Jordan as well.

alliances and licensing agreements with leading international drug companies.

In contrast with Jordan where high tech exports are concentrated, *in Tunisia*, a large number of products contribute modestly to the rise in high-tech exports: electronics, in particular radio, TV and telecom equipments (2.5 percent of total exports), office accounting and computing machineries (1.9 percent) and medical, precision and optical equipments (1.7 percent) are all contributors to the slow rise in high tech exports. There is no apparent pro-active strategy behind the evolution of these sectors. Their emergence relates to the exploitation of existing advantages: availability of skilled and semi-skilled labor, proximity to the EU and the "natural" development of productive capabilities and inflows of FDI.

Policy discussion: Four observations come out of the analysis in the paper. First, success stories in embracing globalization and moving up the technological ladder exist in MENA, as Jordan's pharmaceutical industry or Tunisia's emerging electronics sector illustrate. Second, "smart" industrial policy seems to play a role in some cases, such as Tunisia's decision to abandon making cars and focusing on parts and components in partnership with European automakers in the mid-1990s. At the same time, success stories identified in both countries are all associated with the establishment of an "enclave" where transparent "rules of the game" are credibly enforced with the help of an external policy anchor either through international agreements (e.g. Jordan's free trade agreement with the US and signature of and compliance with WTO's Intellectual Property Rights) or the establishment of a "special zone/regime" such as Tunisia's "offshore" regime and Jordan's Qualifying Industrial Zone. Finally, when predictable rules of the game exist and are credibly enforced, success stories feature an absence of government intrusive "intervention" in all cases. It is noteworthy that the "external anchor policy device" is an important tactic for addressing institutional weaknesses around the world as discussed by Noland and Polack (2007).

These observations point to the importance of trade tools and a predictable business environment as important ingredients for industrial success in Jordan and Tunisia. In particular, the institutional

framework for business conduct seems to be a key determinant of private investment, whether from foreign or domestic entrepreneurs. This is consistent with the main finding of the World Bank regional study “from Privileges to Competition” published in 2010⁵. The main policy implication from the findings of the paper (as for the Bank report) is that Jordan and Tunisia need first and foremost a reform of the way the state interacts and interface with the private sector. This institutional reform is also a pre-requisite for any effective industrial policy support that these countries may envisage going forward. The current Arab Spring context provides for a unique opportunity to undertake this reform and send the signal the change is real. Indeed, countries at the frontier of innovation typically enjoy a stable, trust-based societal environment. The institutional reform entails deep political and public administration reform to upgrade public services standards in Jordan and Tunisia.

Policy Options for Jordan: Given the patterns of changes in export structures analyzed above simply improving the rules of the game does not seem sufficient to accelerate structural change. In the case of Jordan, a key question is whether the country should base its movement up the technological ladder solely on one sector: pharmaceutical. Therefore the question arises as to how Jordan can replicate the success in this sector elsewhere, given its capabilities and endowment⁶. Another question is whether it is advantageous for Jordan to spend much public resources to support the textiles and clothing sector, when the latter employs predominantly foreign labor, displays poor working standards, uses scarce water and energy and is subject to eroding preference in the US as the latter is more open to China and other large suppliers since the removal of the Multi-fiber agreement. While the response to these questions is beyond the scope of this paper, they are worth considering as Jordan devises a new industrial strategy.

Policy Options for Tunisia: For Tunisia, a key industrial strategy question is whether the country

should focus keep counting on a large number of sectors/ products to accelerate its movement up the technological ladder developing or on a few strong sectors where the country has demonstrated real capacity in recent years. Another question is whether Tunisia can boost growth in its emerging high-tech sectors (electronics, office accounting and computing machineries and medical, precision and optical equipments) without deliberately creating new advantages (specialized skills, specific technological/innovation capabilities and specific inputs such as new legislation, accreditation or industry-specific infrastructures) and/or attracting specific international firms/champions. In any case, the existence of market failures with access to credit, skilled labor and specific knowledge provide a rationale for specific policy interventions, beyond broader reform efforts to improve the business environment and providing generic infrastructure. Greater accountability of policymakers and control of corruption (institutional reform) will however be necessary to avoid the usual pitfalls associated with government intervention.

Conclusion: Finally, improving the environment for innovation may facilitate the movement up the technological ladder in both Jordan and Tunisia. As found by Jean Francois Rischard et al, in a World Bank informal study, innovation policy in both countries is (i) too narrowly cast, addressing mostly technological innovation and largely missing out on today’s important non-technological sources of innovation; (ii) suffers from an institutional spaghetti bowl problem with too many organizations with confusing/overlapping mandates and (iii) not aligned to the country’s industrial strategy and resource endowment. Resources to support innovation are spread across too thin and key priority areas lack adequate resources to undertake their duties. Addressing these shortcomings can be crucial in supporting structural changes in Jordan and Tunisia.

Contact MNA K&L:

Laura Tuck, Director, Strategy and Operations.

MENA Region, The World Bank

Regional Quick Notes Team:

Omer Karasapan, , Roby Fields, and Hafed Al-Ghwel

Tel #: (202) 473 8177

The MNA Quick Notes are intended to summarize lessons learned from MNA and other Bank Knowledge and Learning activities.

The Notes do not necessarily reflect the views of the World Bank, its board or its member countries.

⁵ Type title into search function as Worldbank.org

⁶ Jordan is a services-dominated economy and its current strategy may be sensible. However, to the extent that sectors such as consumer appliances (in particular Air Conditioning) have shown real strengths in recent years, it may be worth keeping in mind.