



MANAGERS' REFLECTIONS on Sub-Sector Performance, Investment, Worker Profile, and Technology Trends



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Manufactured in Jordan

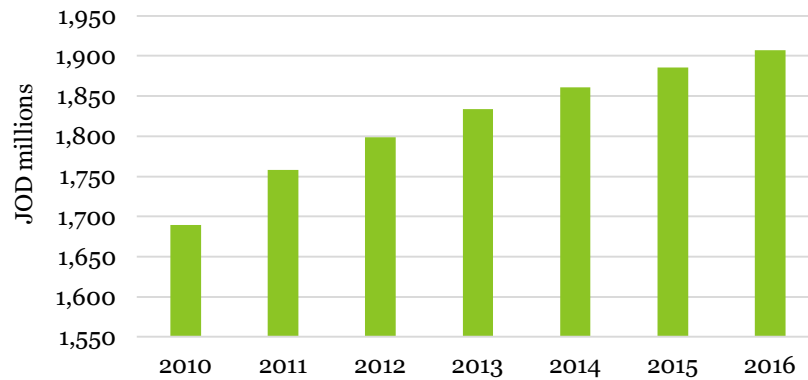
Managers' Reflections on Sub-Sector Performance, Investment, Worker Profile, and Technology Trends

Interview Highlights

- The resounding majority of firms highlight slowing growth and poor prospects. **Loss of business with traditional trading partners** and a **small domestic market** continually surface as factors limiting business expansion.
- The few industries indicating growth in recent years also note sub-sector-wide **technological innovation**, a **diverse customer base**, and the imperative **move towards renewable energy**.
- The concept of what is a 'skilled' worker means different things in different industries. Managers often equate 'skilled' workers with what may be described as 'vocational' or 'craft' workers, such as **tailors, blacksmiths, or printing technicians**.
- Firm managers simultaneously stress the wide availability of labour, while highlighting the **shortage of skilled, 'craft' workers**.
- **Backward linkages to industrial SMEs** appear **scant**, as an overwhelming majority of firms report sourcing the bulk of their inputs from abroad. This underscores the importance of high-level thinking on **Jordan's place in the global supply chain**.
- A relatively large section of firms (**15 per cent**) believe that the technological changes associated with the **Fourth Industrial Revolution** will not affect their sub-sector. An even larger number (**35 per cent**) state that they are **unaware of the Fourth Industrial Revolution**.

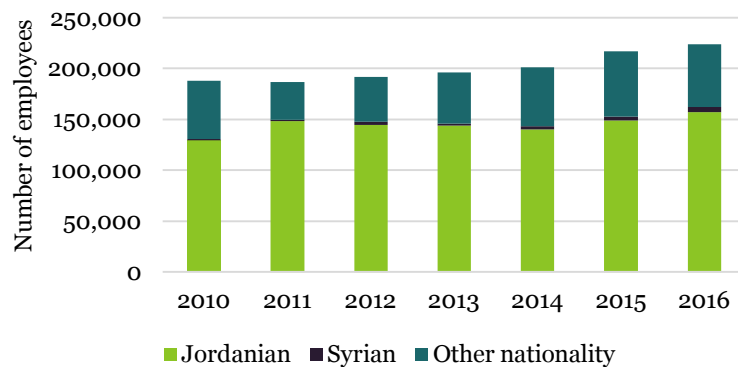
The signing of the Jordan Compact in February 2016 unleashed a wave of optimism that a larger workforce combined with improved trade access for industrial goods would ignite a surge in growth of Jordan's manufacturing sector. Between 2010 and 2016, GDP from manufacturing in Jordan grew by 13 per cent, and manufacturing employment grew by 19 per cent. While these figures are notable, the overall performance of this sector has been below expectations. Much needed investment flows have not been forthcoming, and many questions around automation, mechanisation, and worker redundancy remain unanswered.

Figure 1: Jordan GDP from Manufacturing 2010-2016



Source: Jordan Department of Statistics

Figure 2: Manufacturing sector employment 2010-2016



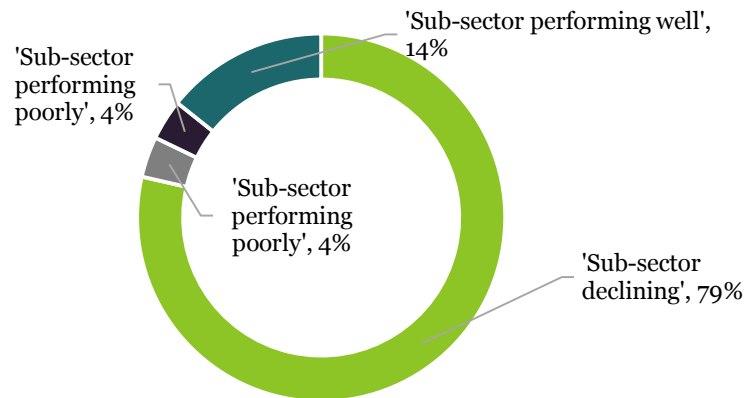
Source: Jordan Department of Statistics

In an effort to understand the outlook, trends, and overriding characteristics of Jordan's manufacturing sector, the WANA Institute conducted a series of interviews with firm managers across ten industrial sub-sectors, including cosmetics and chemicals, cotton and textiles, engineering and IT, food processing, packaging, paper and cardboard, plastic and rubber, renewable energy, pharmaceutical and medical, water, and wood and furniture. Discussions taking place over the course of 30 interviews explored questions on the performance of the sub-sector, recent and future investments in fixed assets, human capital investment and training, notable skills gaps, and future technology trends. **While this report draws tentative conclusions on skills gaps, investment preferences and other trends, it should be noted that the overall methodology was qualitative in nature. The interviews provide reflections, rather than concrete figures, on trends shaping the business environment in ten different industrial sub-sectors.** Major highlights are discussed below:

Sectorial Performance

The economic environment in Jordan has suffered in recent years due to a wide range of factors including the adverse political situation in the region. Within this context, firm managers were asked to describe the recent performance of their sub-sector. The business outlook across all sub-sectors was overwhelmingly negative, with a preponderance of firm managers suggesting that business activity in their sub-sector was declining — although there often appeared to be different views within the same sub-sector. Approximately 79 per cent of interviewed managers expressed the view that their sub-sector was declining; 14 per cent expressed the view that their sub-sector was performing well; four per cent expressed the view that their sub-sector had experienced moderate performance, and an additional four per cent expressed the view that their sub-sector was performing poorly.

Figure 3: 'How is your sub-sector performing?'



Although there often appeared to be different views within the same sub-sector, approximately 79 per cent of interviewed managers expressed the view that their sub-sector was declining; 14 per cent expressed the view that their sub-sector was performing well; four per cent expressed the view that their sub-sector had experienced moderate performance, and an additional four per cent expressed the view that their sub-sector was performing poorly.

Within the cosmetics and chemicals, engineering and IT, food processing, plastic and rubber, and wood and furniture sub-sectors, all interviewed firm representatives expressed the view that business activity was in a state of decline. Frequently stated reasons for poor performance included a loss of market share in Iraq, Syria, Yemen, and Turkey; high electricity costs, and weak purchasing power within the local market. Other less-cited, but still relevant, explanations highlighted a lack of adequate sales and marketing capacity and over-reliance on traditional markets.

Differences of opinion emerged in the textiles and cotton; packaging, paper and cardboard; renewable energy, and pharmaceutical and medical sub-sectors. Those firms noting sub-sector growth highlighted sector-specific trends such as recent innovation in packaging, the diverse market in the case of the pharmaceutical industry, and the high electricity costs that are driving corporates and consumers to shift towards renewable energy.

Fixed Asset vs. Human Capital Investment

A lingering question around investment and job creation for Jordanians and Syrian refugees is how firms would invest in the event of improved access to equity or debt financing. Senior managers were asked to describe worker profiles and to discuss how their firm prioritises investment in fixed assets versus investment in human resources.

Worker Profiles

When asked to describe the different categories of workers in their firms, senior managers across all firms distinguish between two types of workers: skilled and unskilled. Skilled labour tends to include management, accounting, marketing, and engineering professionals, as well as technicians. While the majority of firms across all industrial sub-sectors — chemicals and cosmetics, cotton and textiles, engineering and information technology, food processing; packaging, paper and cardboard; plastic and rubber, renewable energy, water treatment and management, and wood and furniture —

describe the core of their workforce as 'skilled,' it is important to note that the latter term is broad and may mean different things in different industries. For example, senior managers from the cotton and textiles sub-sector described sewing, stitching and production as 'skilled' crafts, while managers in other sub-sectors limited skilled occupations to management, accounting, and engineering occupations. Nonetheless, taking a deeper look at how managers view the skillsets of their workers is useful for understanding how Jordanian and Syrian refugee workers might be increasingly included in Jordan's industrial labour force.

On average, managers describe 50 per cent of industrial workers as skilled; although there is considerable variation across sub-sectors. Overall, the chemicals and cosmetics industry emerged as the sub-sector with the smallest proportion of skilled workers, with a ratio of one skilled worker for every four unskilled workers. The water treatment and management and wood and furniture sub-sectors followed, each with a ratio of two skilled workers for every three unskilled. The food processing, plastic and rubber, and renewable energy industries emerged as slightly more characterised by a skilled workforce, all with ratios of three skilled workers for every two unskilled workers.

Managers in the packaging, paper and cardboard sub-sector described their workforce as equally distributed between skilled and unskilled workers with a ratio of one-to-one. Managers from the cotton and textile and engineering and information technology sectors report the highest proportion of skilled workers, each with ratios of approximately seven skilled workers for every three workers who are unskilled. It should be noted that these figures were not the result of a rigorous quantitative survey but rather represent a broad picture of managers' impressions of the technical capacities of their workers.

Skilled Labour



Management, Accounting,
Marketing, Engineering,
Technicians

Unskilled Labour



Packing, Packaging,
Loading and Unloading,
Cleaning

vs.

Skills Gaps

High turnover rates and lack of long-term commitment amongst workers is a resounding complaint made by managers across many firms and all sub-sectors. A number of managers cite management, sales and marketing skills as a challenge, while certain sector-specific technical skills also appear to be an issue for some firms. Within the garment industry, managers make note of the lack of skilled tailors, while managers within the printing and paper industry and plastic and rubber sub-sector state that it is difficult to find printing technicians and plastic pipe pulling technicians. Within the engineering and IT sub-sector, managers make note of the time it takes to train blacksmiths. Machine operation is also frequently mentioned as a skill that requires time to develop.

Training Programmes

Training periods vary significantly depending on the skillset. The bulk of managers within the textile, food processing, plastic and rubber, renewable energy, and water treatment sub-sectors describe training programmes lasting between two to three months. Managers from the wood and furniture industry describe longer training periods lasting between three and six months. Engineers in the engineering and IT industries are also reported to need three to six months of training. Workers in the cosmetics and chemicals and water treatment sectors require shorter training programmes of between two weeks to two months. Most trainings appear to be conducted on-the-job, with the overall cost not exceeding the value of the given employee's salary for the training period, except for in cases where machines are broken. Firms occasionally mention employee participation in external trainings. Only one firm, within the renewable energy sub-sector, made specific reference to custom-designed trainings on management systems and other topics related to renewables such as energy auditing and electrical systems.

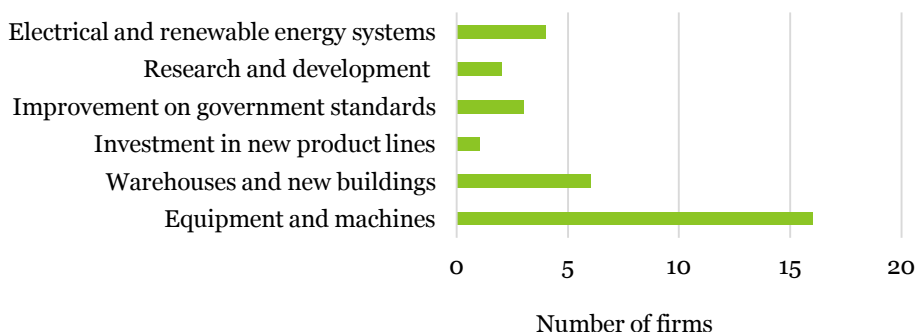
Investment Trends

Fixed Assets

Twenty-five out of 29 firms reported having made fixed asset investments over the past year; four firms reporting having made no fixed asset investments over the past year. New machines and equipment was the most frequent category of investment with 16 out of 29 firms reporting, followed by warehouses and new buildings with six of 29 firms reporting. Four firms reported investments in electrical and renewable energy systems; three firms reported investments aimed at bringing factories in line with newly-mandated industry standards; two firms reported investment in research and development programmes, and one firm reported investment in new product lines.¹

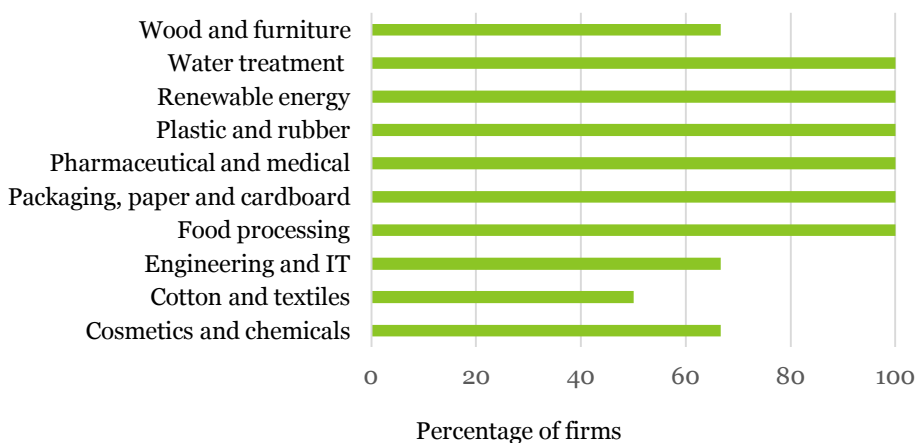
¹ Many firms reported more than one category of fixed asset investment; therefore, these figures reflect multiple categories of fixed asset investment on the part of several firms.

Figure 4: Number of firms reporting fixed asset investments



A large number of industrial sub-sectors had all firms reporting at least one category of fixed assets investment: all interviewed firms within the food processing; packaging, paper and cardboard; pharmaceutical and medical; plastic and rubber, renewable energy, and water treatment reported some fixed asset investment during the previous year. Two-thirds of firms within the cosmetics and chemical, engineering and IT and wood and furniture sub-sectors and 50 per cent of firms within the cotton and textiles sub-sector reported fixed asset investments over the previous year.

Figure 5: Firms reporting fixed asset investments by sub-sector



Human Resources

An overwhelming majority of firms emphasise the importance of skilled labour, with most noting that the availability of workers in Jordan is not a matter of concern. Amongst mentioned investments in human resources were the employment of staff for research and development programmes, marketing initiatives, teams of consultants to develop strategy on new product lines, and the launch of a specific department dedicated to employee training.

Firm manager estimates of the cost of job creation for their company differ significantly from previous WANA estimates.² Not all firms provided a specific figure on the investment cost per job created. Amongst those that did, the majority state that USD50,000 would result in the creation of between five and ten jobs.

When asked to describe how their firm prioritises investment in fixed assets versus investment in human resources, the majority of firms do not express a clear preference. Such a tendency could reflect the fact that in the context of Jordan's slowing GDP growth environment many firms are more focused on short-run performance than they are long-term strategy. The lacklustre response here might also suggest that firm managers do not have a clear vision of the direction their industry will take alongside emerging technology, mechanisation and automation trends.

Sourcing of Raw Materials

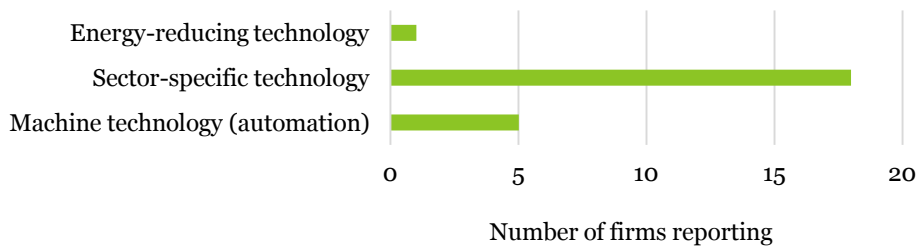
When asked to describe their firms' sourcing of raw materials, all firm managers acknowledged that a large proportion of inputs are imported from abroad. The almost-unanimous reasons cited were lack of domestic alternatives and the relatively high prices associated with domestically sourced inputs. Sourcing of raw materials from abroad is reasonable given Jordan's small domestic market and limited natural resources. Nonetheless, the consistent reference to the high prices and lack of domestic alternatives underscores the need for high-level, strategic thinking on Jordan's comparative advantage, positioning, and specialisation in the global supply chain. The identification of specific areas where SMEs can develop their strategic advantage and the formation of industrial clusters to support backward linkages should also draw a similar level of attention.

Future Technological Innovation

In the final part of the interview, firm managers were asked to discuss their views on technology and more specifically the changes that will be brought by the Fourth Industrial Revolution. When asked to describe those emerging technologies most relevant to their firm, the majority — 18 firms — mentioned sector-specific technologies. Five firms mentioned automation, and one firm mentioned energy-reducing technologies. A large number of firms expressed a willingness to invest in new technologies, but in most cases plans appeared to be unspecific, and managers underscored the lack of needed financing.

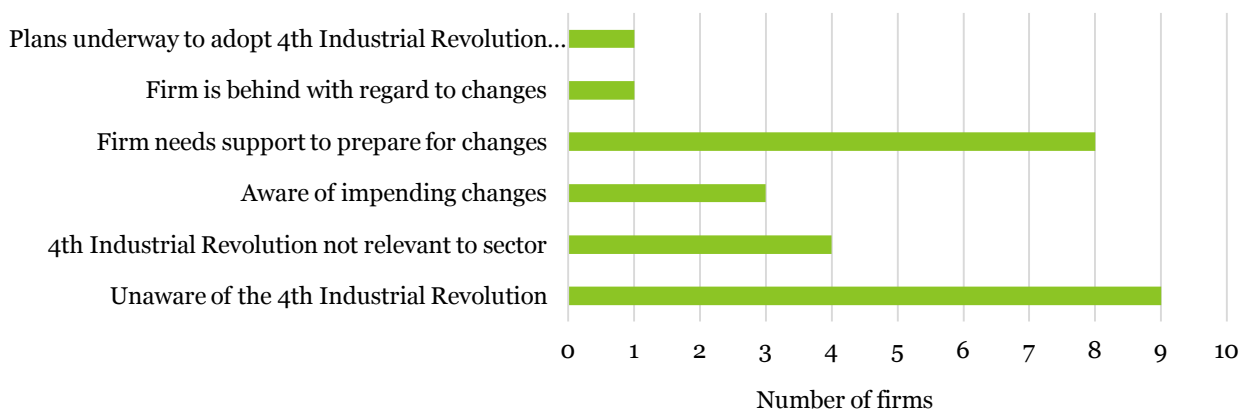
² A previous WANA report — 'Providing 200,000 Work Opportunities for Syrian Refugees in Jordan: A Viability Assessment' — estimated that an investment of approximately JOD56,950 would create one job in the industrial sector.

Figure 6: Emerging technologies reported by firm managers



The Fourth Industrial Revolution — which is best defined as a series of technological changes and innovations marked by robotics, artificial intelligence, nanotechnology, biotechnology, quantum computing, the Internet of things, fifth-generation wireless technologies, 3D printing, and autonomous vehicles³ — inspired even less of a reaction on the part of firm managers. Only one firm reported plans to adopt Fourth Industrial Revolution technologies; one manager expressed the belief that his firm was ‘behind’ with regard to the changes underway in his sub-sector, and three indicated that they were aware of impending changes. Eight firms — 31 per cent of those commenting on the issue — called for external support to prepare for the changes that will be brought on by the technological shift. Four firm managers expressed the belief that the Fourth Industrial Revolution was not relevant to their sub-sector, and an additional nine managers — 35 per cent of those commenting on the issue — stated that they were unaware of the phenomenon. The degree to which technological advances will or will not affect distinct industrial sub-sectors remains to be seen. However, the relatively small portion of firms indicating clear thinking on the issue should be seen as a matter of concern.

Figure 7: Firm manager views on 4th Industrial Revolution



³ Fourth Industrial Revolution, https://en.wikipedia.org/wiki/Fourth_Industrial_Revolution

Annex 1: List of Interviews

| | |
|------------------------------|--|
| Cosmetics and Chemicals | International Ferti Technology Co |
| | MBC |
| | Natural Care |
| Cotton and Textiles | Arab Weavers Union Company |
| | Akkad for Manufacturing of Carpets |
| Engineering, Electrical & IT | Arab Engineers Water Technology |
| | Arabella Extrusion Company |
| | Deera Service and Spare Parts Trading |
| Food Processing | Akasheh Company for Frozen Goods |
| | Nutridar |
| Engineering, Electrical & IT | Arab Engineers Water Technology |
| | Arabella Extrusion Company |
| | Deera Service and Spare Parts Trading |
| Paper, Packaging & Cardboard | Alhadba'a Company for the Packaging of Drinking Water |
| | Digital Label Motaz |
| | Jordan Packaging Centre |
| Pharmaceutical & Medical | Pioneers for veterinary of agriculture medicine industries |
| | RAM Pharmaceutical Industries Company |
| | RETAJ Pharmaceuticals Industries |
| Plastic & Rubber | Al Anmar Factory for Plastic Industry |
| | World Plastic for Construction |
| | Gulf Technical Industrial Establishment |
| Wood & Furniture | Arab Company for Formica and Wood Industry |
| | Al Tieaa for Furniture |
| | Al Wateer for Wood Industry |
| Water Treatment | Arab Engineers Water Technology |
| | Al Shoof Water |
| | شركة الشامية للقواطع المعدنية |
| Renewable Energy | ETA Max |
| | Noor for Solar Energy |
| | Hiba for Renewable Energy Engineering |



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