



Investment and Employment Trends in Jordan's Key Economic Sectors



West Asia-North Africa Institute, March 2019



All content of this publication was produced by Dr Salem Ajluni and Dorsey Lockhart. This publication is generously supported with funds on behalf of UKAID and implemented by Mercy Corps. This publication reflects the views of the authors only, and not necessarily of Mercy Corps.

PERMISSION TO REPRODUCE

The information in this publication may not be reproduced, in part or in whole and by any means, without charge or further permission from the WANA Institute. For permission to reproduce the information in this publication, please contact the WANA Institute Communications Department at info@wana.jo.

Principal author: Dr Salem Ajluni

Contributing author: Dorsey Lockhart

Design: Lien Santermans

Cover image: © Rami Tarawneh

Published by the WANA Institute, Royal Scientific Society in Amman, Jordan.

Printed in Amman, Jordan

© 2019 WANA Institute. All rights reserved.

Manufactured in Jordan

Table of Contents

1.	Introduction.....	3
2.	Agriculture Sector Trends	5
2.1	Agriculture in the Larger Economy	5
2.2	Agriculture and Employment.....	5
2.2.1	Employment.....	5
2.2.2	Labour Productivity	6
2.3	Capitalisation of Agriculture.....	7
2.4	Investing in Agriculture.....	8
3.	Construction Sector Trends	10
3.1	Construction in the Larger Economy.....	10
3.2	Construction and Employment	10
3.2.1	Employment.....	10
3.2.2	Labour Productivity	12
3.3	Capitalisation of Construction	12
3.4	Investing in Construction	13
3.5	Key Conclusions	14
4.	Manufacturing Sector Trends	15
4.1	Manufacturing in the Larger Economy	15
4.2	Manufacturing and Employment.....	15
4.2.1	Employment.....	15
4.2.2	Labour Productivity	16
4.3	Capitalisation of Manufacturing	17
4.4	Investing in Manufacturing	17
4.5	Key Conclusions	18
5.	Services Sector Trends	19
5.1	Services in the Larger Economy.....	19
5.2	Services and Employment	19
5.2.1	Employment.....	19
5.2.2	Labour Productivity	20
5.3	Capitalisation of Selected Services.....	21
5.4	Investing in Selected Services.....	21
5.5	Key Conclusions	22
6.	Discussion & Conclusions.....	24
6.1	Sector Performance, 2009-2016.....	24
6.2	Policy Implications for Jordan	25
6.2.1	Employment Creation	25
6.2.2	GDP/Value-Added and Return on Investment	26
6.2.3	Key Take-Aways.....	27
6.3	Refugee Policy and Future Applications	27

7.	Annex 1: Agriculture Sector Tables	29
8.	Annex 2: Construction Sector Tables	32
9.	Annex 3: Manufacturing Sector Tables	35
10.	Annex 4: Selected Services Tables	38

1. Introduction

The onset of the Syrian refugee crisis in Jordan and the subsequent signing of the London Compact agreements marked a paradigm shift in the way host governments and donors view refugee populations. While in previous contexts, host countries have seen refugees as a burden on local economies, in the aftermath of 2016, a wide range of stakeholders have combined forces to capitalise on Syrian refugees' potential to augment the labour force. Although the result may still be below expectations – between January and December 2018 only 45,649¹ Syrian employment arrangements were formalised² – real progress will require a sustained effort that extends well beyond the date of this publication.

Job creation in Jordan and in the broader WANA region has become a buzzword not only within economic policy and development circles but also amongst humanitarian response stakeholders. However, it must be noted that the prioritisation of job creation that has emerged in the context of the Syrian refugee crisis cannot be implemented in a vacuum. Jordan's labour market is constrained by a combination of longstanding structural factors – including a strikingly low labour force participation rate,³ high rates of informal employment,⁴ a disproportionately large public sector,⁵ and a high penetration of expatriate workers.⁶ Creating quality employment for Jordanians and for Syrian refugees will require gradual efforts to resolve these issues, while taking into account the changing nature of work.⁷

Boosting investment has long been considered a central component of economic growth and job creation. Okun's Law, an economic theory developed in the 1960s by the macroeconomist Arthur Okun, states that a one percentage point increase in unemployment is associated with a 2 per cent drop in GDP growth.⁸ Within this framework, investment, or more precisely stimulus through government spending, is the policy tool commonly used to boost economic growth and thereby decrease unemployment. While Okun's Law was developed based on economic data from the

¹ UNHCR, 'Ministry of Labour: Syrian Refugee Unit Work Permit Progress Report,' December 2018, https://data2.unhcr.org/en/search?sv_id=4&geo_id=36&type%5B0%5D=document§or_json=%7B%220%22%3A+%220%22%7D§or=0&page=3

² The second publication in this report series 'The Syrian Refugee Crisis and Its Impact on the Jordanian Labour Market,' estimates that as many as 110,509 Syrians may have been active in the Jordanian labour market in 2016.

³ Jordan's labour force participation rate was approximately 39.02 per cent in 2018, compared to 48.26 per cent across the MENA region, and 59.56 per cent across OECD member states.

See, The World Bank, <https://data.worldbank.org/indicator/SL.TLF.CACT.ZS>

⁴ See sections 2.2, 3.2, 4.2, and 5.2 of this report. Two studies conducted by Jordan's Ministry of Planning and International Cooperation (MOPIC) and UNDP suggest that informal employment represent 44 per cent of total employment in Jordan.

⁵ According to the Department of Statistics (DoS), government services accounted for approximately 26 per cent of employment in 2016. Alhajahmad & Lockhart, 'Jordan's Recent Economic Performance: Implications for Future Growth, Investment, Refugee Policy and Refugees,' WANA Institute, August 2017, http://wanainstitute.org/sites/default/files/publications/Publication_JordansRecentEconomicPerformance_English.pdf

⁶ According to DoS datasets, foreign workers, including Syrians, accounted for approximately 70 per cent of agricultural workers in 2016; 24 per cent of construction workers, 30 per cent of manufacturing workers, and 11 per cent of selected services workers.

⁷ Analysts increasingly highlight the changing nature of work. Digitisation, artificial intelligence, robots, and large reserves of freelance workers will change company human resource strategies and may make workers redundant.

See takeaways from the Economist's Future of Work conference, <https://www.a-connect.com/acknowledge/everything-you-need-to-know-about-the-changing-world-of-work-according-to-the-economist/>

⁸ National Bureau of Economic Research, 'Okun's Law: Fit at Fifty,' January 2013, <https://www.nber.org/papers/w18668>

United States, several economists have suggested that the theory partially holds for middle-income countries.⁹

As Jordan has suffered from sluggish GDP growth and rising unemployment,¹⁰ analysts and advocates of the Jordan Compact framework have increasingly looked to investment as a potential remedy. The London Initiative, an international conference co-hosted by the governments of Jordan and the UK, is an example of this thinking. The conference, which was held in London on the 28th of February showcased key sectors in order to support Jordan in its effort to attract investment, bolster growth, and create jobs.¹¹

The objectives of this research were conceived in early 2016 in the aftermath of the Jordan Compact – before Jordan’s annual growth rate fell below 2.5 per cent, and well before the planning of the London Initiative. As the WANA Institute has sought to measure the success of the Jordan Compact, lacklustre results have often begged the hypothetical question: what would greater levels of investment have meant for employment? Constructing a counter-narrative around this is complex and leads to a host of other circular questions on inflation and investment absorption capacity.

Nonetheless, a step-by-step review of sector-level real GDP, employment, and capitalisation – the figures that together determine the sensitivity of employment to investment – is a useful exercise. The analysis that follows should not be taken as a set of policy recommendations but instead as a framework for approaching the policy debate on investment and employment. The figures presented on agriculture, construction, manufacturing, and selected services are neither permanent nor conclusive. Rather they draw on the best available data from recent years to tell the story of each of these sectors, while drawing attention to the implications of, and trade-offs between, employment growth, capitalisation, and productivity. The purpose is therefore to provide policy-makers, donors, and stakeholders with a relevant quantitative framework for understanding the relationship between investment and employment across key economic sectors of the Jordanian economy.

⁹ Some economists have suggested that in the context of developing countries, unemployment does respond to an increase in economic growth, however with a weaker coefficient.

See Ball, Furceri, Leigh & Loungani; ‘Does One Law Fit All? Cross-Country Evidence on Okun’s Law,’ September 2016, <http://unassumingeconomist.com/wp-content/uploads/2016/08/cross-country-evidence-on-okun-sep-2016-paris-workshop-draft-with-tables-and-charts.pdf>

¹⁰ According to the Central Bank of Jordan, between 2016 and 2018 Jordan’s GDP growth rate has not surpassed 3 per cent. The unemployment rate rose to 15.28 per cent in 2016 and later to 18.5 per cent in the second quarter of 2017.

<https://tradingeconomics.com/jordan/gdp-growth-annual>; <https://tradingeconomics.com/jordan/unemployment-rate>

¹¹ See, About Jordan: Growth and Opportunity – the London Initiative 2019, <https://www.gov.uk/government/topical-events/jordan-growth-and-opportunity-the-london-initiative-2019/about>

2. Agriculture Sector Trends

2.1 Agriculture in the Larger Economy

Agriculture accounts for a small share of Jordan's gross domestic product (GDP) – 5.2 per cent of inflation-adjusted output, or real GDP in 2016.¹² The agriculture sector's share of the larger economy remained consistent over the time period between 2009 and 2016, with slight variations which were largely the result of varying weather patterns and other factors such as changes in import policies and changes in market prices. The real GDP growth rate for the sector was 13.9 per cent over the same period.

	Gross Domestic Product (JOD millions, constant prices)	Agriculture Gross Domestic Product (JOD millions, constant prices)	Agriculture GDP Share
2009	23,315	1,282	5.50%
2010	23,934	1,371	5.73%
2011	24,611	1,425	5.79%
2012	25,134	1,291	5.14%
2013	25,722	1,246	4.84%
2014	26,592	1,340	5.04%
2015	27,272	1,406	5.16%
2016	27,830	1,460	5.25%

2.2 Agriculture and Employment

2.2.1 Employment

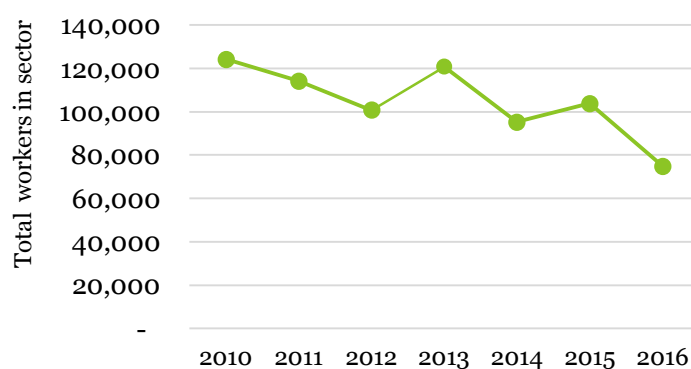
Agriculture accounts for a small proportion of the Jordanian workforce, and over the past two decades, total employment in the sector has declined significantly. According to Department of Statistics figures, there were a total of 74,905 persons employed in agriculture in 2016. By comparison, in the year 2000, there were a total of 162,732 workers in the sector, indicating a total decline of 54 per cent over this 16-year period and an average annual decline of 1.7 per cent.

¹² Data are from the Department of Statistics as provided to the WANA Institute, October 2018.

¹³ Data on agricultural GDP provided by DOS to WANA contained a glaring inconsistency. In particular, there is an unexplained decline of more than half in the value of agricultural GDP as between 2009 and 2010. This may be due to a data revision process. The data in this table are from the Department of Statistics *Statistical Yearbook 2017*, p. 278. The data in this source appear to be a more consistent – and more recent – DOS series. While that series excludes the period before 2009, the data make general assessments of agricultural conditions in recent years possible.

Jordan's agriculture sector is characterised by a large proportion of foreign workers. In 2016, approximately 70 per cent of total workers in the sector were foreign. The great majority of foreign workers – approximately 85 per cent – were employed in the cultivation of field crops. The low participation of Jordanian workers in the agriculture sector is the result of a process that has occurred over the course of many years. During the period between 2000 and 2016, the relative share of Jordanian workers in the agriculture sector declined from 63 per cent to 30 per cent.¹⁴ In 2017, Egyptian workers accounted for 73 per cent of registered expatriate workers in the agriculture sector. During the same year, Syrian workers accounted for 24 per cent of registered expatriate workers.¹⁵

Figure 1: Total employment in Jordan's agriculture sector, 2010-2016



Jordan's agriculture sector is also characterised by a large amount of labour informality. Informality is defined as the 'lack of an explicit work contract and/or social insurance coverage.'¹⁶ Department of Statistics data suggests that approximately 58 per cent of Jordanian agricultural workers¹⁷ and an even larger share of foreign workers¹⁸ are employed informally. The large amount of casual and seasonal foreign labour and Jordanian household labour that has been characteristic of Jordanian agriculture in the period between 2000 and 2016 accounts for this informality.¹⁹

2.2.2 Labour Productivity

Labour productivity in the agriculture sector is defined as GDP in the sector divided by the number of persons employed in the sector. Between 2009 and 2016, GDP, or value-added per worker grew

¹⁴ These figures are from the Department of Statistics as provided to the WANA Institute, October 2018.

¹⁵ Department of Statistics *Jordan Statistical Yearbook, 2017*, number 68, n.d., p. 56. The data in this table refers to the number of work permits issued and do not necessarily indicate actual employment. Anecdotal information suggests that workers with agriculture permits find employment in other activities, mainly in the large cities.

¹⁶ The definition of informality is taken from the two studies conducted by the Ministry of Planning and International Cooperation and the UNDP and released in 2012: *The Informal Sector in the Jordanian Economy* and *The Panoramic Study of the Informal Economy in Jordan*.

¹⁷ The data is from the Department of Statistics *Employment and Unemployment Survey 2013*.

¹⁸ See Jordan Ministry of Planning and International Cooperation *Jordan's National Employment Strategy, 2011-2020* (2010), pp 59-60.

¹⁹ Approximately 50 per cent of foreign workers were casual labour, and 5 per cent were seasonal labour; an estimated 62 per cent of Jordanian workers in agriculture were household labourers, mainly unpaid and raising livestock; another 30 per cent were casually employed. The data is from the Department of Statistics as provided to the WANA Institute, October 2018.

by 125 per cent, with large increases in 2010, 2014, and 2016. These boosts in productivity coincide with unexplained, irregular changes in the number of people employed in agriculture and most likely reflect the withdrawal of labour from the sector rather than improvements in technology. This is consistent with the changing nature of Jordanian agriculture: over the past two decades, Jordan's agriculture has gradually transitioned from small, family-owned and rain-fed activities to larger more commercialised operations.²⁰ It should be noted that the increase in labour productivity occurred in parallel with steady output growth in the agriculture sector. Between 2009 and 2016, real GDP from agriculture grew by 14 per cent (See Annex 1, Table 12).

2.3 Capitalisation of Agriculture

Capitalisation, or investment, in the agriculture sector consists of the purchase of land, livestock, physical structures for storage of produce and supplies, tools, irrigation systems, seeds, fertilisers, pesticides, and herbicides. Funds invested in inputs and production methods should serve to boost agriculture output and labour productivity. Overall, the real value of invested capital in Jordan's agriculture sector fell significantly between 2010 and 2013 before rising slightly in 2015 and then rising more significantly in 2016. This suggests that over the period between 2009 and 2015, the overall stock of agriculture inputs depreciated at a rate that exceeded the pace of new investment. In 2016, the real value of capital stock for the agriculture sector recuperated by approximately 5 per cent, indicating that during this year investment outpaced depreciation.

Over the 2009-2016 period, the real net amount of capital stock in Jordanian agriculture contracted more slowly than did employment. This resulted in a 58.3 per cent increase in the capital-to-labour ratio, underlying an important shift by which the agriculture sector became more capital-intensive relative to employment.

Figure 2: Changes in the real value of net capital stock in Jordanian agriculture, 2010-2016



²⁰ See European Commission *Pre-identification mission: support to agricultural development in Jordan* (Volume I: Assessment of the Agricultural Sector in Jordan), draft final report, 15 April 2012, pp. 38-41, 88-91.

2.4 Investing in Agriculture

The previous sections explain how the agriculture labour force has shrunk more rapidly than invested capital has been depleted. The combination of these factors has created a trend by which those workers who have remained in the sector have, on average, larger amounts of capital stock with which to work. The growth in the capital-to-labour ratio between 2009 and 2016 resulted in a large increase in worker productivity, or value-added produced per worker. Consequently, output for the sector grew in spite of the reduction in workers. In 2009, for each JOD invested, one agriculture worker produced JOD1.62 worth of agricultural goods, whereas in 2016, for each JOD invested, one agriculture worker produced JOD2.31 worth of agricultural goods.^{21/22}

	Capital/ Labour (2016 JOD)	Agriculture GDP/ Labour (2016)	Agriculture GDP/ Labour to Capital/ Labour
2009	5,342	8,669	1.62
2016	8,455	19,491	2.31
Changes	58.3 %	124.8%	

This suggests that from an economic perspective, over the period between 2009 and 2016, capital investment in Jordanian agriculture became more efficient at producing market value, which should translate into an improved return on investment for investors.

2.5 Key Conclusions

In the period between 2009 and 2016, the declining value of capital stock in agriculture coincided with an even greater decline in total employment in the sector, as a large number of Jordanian agricultural workers left family farms in search of better-paid employment in cities and towns. This resulted in an estimated 58 per cent increase in the capital-to-labour ratio for the agriculture sector.

As discussed in the previous section, over this period value-added per agriculture worker increased; the efficiency by which invested capital is translated into market value also increased, and the sector's potential to augment GDP increased. The accumulation of capital relative to labour that occurred over the seven-year period would suggest that the amount of investment required to create one job also increased. That is to say, the investment cost of job creation with the agriculture sector became greater. In 2016, an investment of JOD8,455 was necessary to enable the work of one agriculture sector worker, whereas in 2009 JOD5,342 was required to enable the work of one agriculture worker.

²¹ This calculation refers to the market value of agricultural goods produced in JOD 2016 prices.

²² The average GDP/Labour-to-Capital/Labour ratio of the 2009-2016 period was 2.1, slightly lower than the 2016 value. Taking the average figure from across the seven-year period would suggest that approximately JOD2.1 in agricultural goods would have been produced for every JOD invested over the period. For consistency, 2016 values of the GDP/Labour-to-Capital/Labour ratio are used across all sectors analysed in this report. However, it should be noted that the 2009-2016 average may provide a more accurate picture for agriculture, as investment levels in that sector are subject to large fluctuations in line with changing weather patterns and other variables.

If these figures are accurate, then an investment of JOD1 million could be expected to require the entry into the sector of approximately 118 new workers. Assuming these workers were fully employed throughout the year, they would be expected to generate an additional JOD2.31 million in value-added, or GDP.

3. Construction Sector Trends

3.1 Construction in the Larger Economy

Construction accounts for a small share of Jordan's gross domestic product (GDP) – equivalent to just 3 per cent of inflation-adjusted output, or real GDP, in 2016.²³ As indicated by the figures in Table 3, the size of the sector relative to the rest of the Jordanian economy declined slightly between 2009 and 2016, with an average value of 3.1 per cent of real GDP over the entire period. During this time, the sector experienced significant declines in 2010, 2011, and 2012 followed by more sporadic growth between 2013 and 2016. Over the full period between 2009 and 2016, real GDP for the sector grew at a rate of 5 per cent.

	Gross Domestic Product (JOD millions constant prices)	Construction Gross Domestic Product (JOD millions constant prices)	Construction GDP Share
2009	23,315	821	3.52%
2010	23,934	783	3.27%
2011	24,611	750	3.05%
2012	25,134	743	2.96%
2013	25,722	807	3.14%
2014	26,592	862	3.24%
2015	27,272	851	3.12%
2016	27,830	860	3.09%

3.2 Construction and Employment

3.2.1 Employment

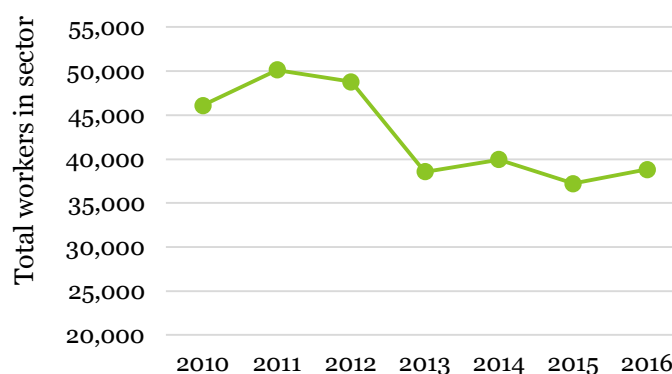
The construction sector accounts for a small share of overall employment in Jordan – approximately 3.8 per cent over the 2009-2016 period. According to Department of Statistics figures, a total of 38,825 workers were employed in the sector in 2016 up from 23,379 in 2000, for an overall growth rate of 66 per cent over the 16-year period. The year 2009 marked a record high within the period, with a total of 51,179 workers. In the years following, the number of workers employed in construction experienced fits and starts, with short upticks in 2011, 2014, and 2016

²³ This data is from the Department of Statistics *Statistical Yearbook 2017*, p. 278.

²⁴ Data in this table is from the Department of Statistics *Statistical Yearbook 2017*, p. 278.

undercut by steady declines in 2012, 2013, and 2015. During the period between 2009 and 2016, the overall level of employment for the sector declined by 24 per cent.

Figure 3: Total employment in Jordan's construction sector, 2010-2016



Like other sectors in Jordan, construction is characterised by a significant presence of foreign workers. Of the 38,825 workers employed in the sector in 2016, 9,288 – or approximately 24 per cent – were non-Jordanian. Between 2000 and 2016, the number of foreign workers grew and then subsequently declined in line with total employment in the sector. In 2008, as employment in construction neared its peak, foreign labour accounted for 41 per cent of employment in the sector. However, by 2016, foreign workers accounted for just 24 per cent of overall labour in the sector (see Annex 2, Table 15).

Like the agriculture sector, the construction sector has been found to be subject to high levels of labour informality. Two studies conducted by the Ministry of Planning and International Cooperation (MOPIC) and the United Nations Development Programme (UNDP) estimated that 78 per cent of Jordanian workers engaged in construction in 2010 were employed informally.²⁵ The large number of workers thought to be working without a formal contract or access to social security has been enabled by two parallel phenomena. Prior to the refugee crisis, Syrian labourers were known to seek informal employment in agriculture, construction, and services for below-market wages on a seasonal basis.²⁶ In addition, in recent years, Jordan has accumulated a large number of undocumented foreign workers, as residents of neighbouring countries have entered as tourists in order to pursue employment, and others have failed to renew previously issued work permits.²⁷

However, it is worth noting that the rate of informality, particularly within the construction sector, may be subsiding. According to research conducted by the Egypt-based Economic Research

²⁵ MOPIC & UNDP, *The Informal Sector in the Jordanian Economy and The Panoramic Study of the Informal Economy*, 2012, <http://www.undp.org/content/dam/jordan/docs/Publications/Gov/The%20Informal%20Sector%20in%20the%20Jordanian%20Economy-jo.pdf>

Both studies were based on the results of the 2010 Labour Market Panel survey, a special survey conducted by the Department of Statistics.

²⁶ CARE Jordan, *Baseline Assessment of Community Identified Vulnerabilities among Syrian Refugees Living in Amman*, 2012, <https://data2.unhcr.org/en/documents/details/36380>

²⁷ MOPIC, *Jordan's National Employment Strategy, 2011-2020* (2010), <http://inform.gov.jo/en-us/By-Date/Report-Details/ArticleId/36/National-Employment-Strategy>

Forum, the number of Jordanian workers, as well as some expatriates, who have joined the national social security system has increased significantly over the past ten years. The proportion of Jordanian workers with disability and retirement social security coverage stood at 63 per cent in 2016. The share of Jordanian construction workers with this coverage rose from 34 per cent in 2010 to 56 per cent in 2016.²⁸

3.2.2 Labour Productivity

Labour productivity in construction is defined as GDP from construction activity divided by the number of persons employed in the sector. Between 2009 and 2016, labour productivity in construction experienced sporadic growth between 2009-2010 and 2012-2015, offset by abbreviated declines in 2011 and 2016. Total productivity growth over the period amounted to an average increase of 38 per cent per year (see Annex 2, Table 17).

These apparent productivity gains in construction were the result of a reduction in overall employment that occurred in parallel with a gradual increase in real GDP for the sector: between 2009 and 2016, employment in construction fell by 24 per cent, while real GDP for the sector increased by approximately 5 per cent. This reduction in employment can be described as a 'secular' change, meaning change that is neither seasonal nor cyclical. This steady drawdown in employment in the context of continued real GDP growth suggests the construction sector in Jordan experienced labour-saving technological change during this period.²⁹

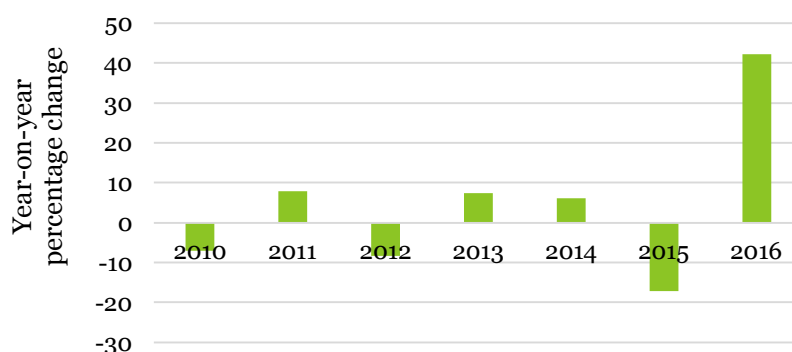
3.3 Capitalisation of Construction

Capitalisation, or investment, in the construction sector consists of the purchase of construction equipment and supplies, as well as investment in business operations such as transport, communications, logistics, and office management. Funds invested in inputs and operations should result in increased outputs and labour productivity. Between 2009 and 2016, the real value of capital invested in Jordan's construction sector underwent a sporadic pattern of decline followed by growth, with a significant drop in 2015 (-17.12 per cent) followed by an even larger increase (42.17 per cent) in 2016. Over the full period between 2009 and 2016, the real value of capital stock registered a 24 per cent increase. This large increase in capitalisation combined with a sharp reduction in employment resulted in a 63 per cent increase in the capital-to-labour ratio for the sector, underlying an important shift by which Jordanian construction became more capital-intensive relative to the level of employment.

²⁸ Alhawarin and Selwaness, 'The Evolution of Social Security in Jordan's Labour Market: A Critical Comparison between Pre and Post-2010 Social Security Reform,' Working Paper No. 1185, Economic Research Forum, April 2018, pp. 12, 14, <http://erf.org.eg/publications/the-evolution-of-social-security-in-jordans-labor-market-a-critical-comparison-between-pre-and-post-2010-social-security-reform/>

²⁹ The calculated 'productivity elasticity of employment' for the seven-year period is -1.57. This is derived by dividing the absolute change in productivity (38 per cent) by the absolute change in construction employment (-24.1 per cent). As the change in productivity is larger than the reduction in employment, the adoption of labour-saving technology is implied.

Figure 4: Changes in real value of net capital stock in Jordan's construction sector, 2010-2016



3.4 Investing in Construction

The previous sections illustrate how a shrinking labour force has occurred alongside rapidly-growing per worker investment levels. Per worker investment levels are reflected in the capital-to-labour ratio, which increased from JOD7,579 per worker in 2009 to JOD12,340 in 2016. Within this context, the real output produced per worker increased, as reflected in a construction real GDP-to-labour ratio of JOD22,151 in 2016 compared to JOD16,042 in 2009.

Indeed, when workers are enabled by larger amounts of capital, an increase in productivity is the expected result. However, in the case of Jordan's construction sector, worker productivity growth was not commensurate with the increase in capital relative to labour ratios. Therefore, as investment relative to labour outpaced productivity growth, the level of output produced per worker fell in relation to JOD invested. In 2009, for each Jordanian dinar invested, one construction worker built a market value of JOD2.12 in infrastructure or buildings; in 2016 for each Jordanian dinar invested, one construction worker built a market value of JOD1.79 in the same structures.³⁰

	Capital/ Labour Construction (2016 JOD)	Construction GDP/ Labour (2016 JOD)	Construction GDP/ Labour to Capital/Labour
2009	7,579	16,042	2.12
2016	12,340	22,151	1.79
Changes	62.82%	38.08%	

This suggests that from an economic perspective, over the period between 2009 and 2016, capital investment in Jordanian construction became less efficient at producing market value. Thus, while larger amounts of capital per worker were successful in boosting output per worker, over the

³⁰ The average GDP/Labour-to-Capital/Labour ratio of the 2009-2016 period was 2.1, higher than the 2016 value. Taking the average figure from across the seven-year period would suggest that approximately JOD2.1 in buildings and structures would have been produced for every JOD invested over the period.

seven-year period the impact of each dinar invested diminished, indicating an inferior return for investors.

3.5 Key Conclusions

As discussed in previous sections, between 2009 and 2016, an increasing value of capital stock coincided with a decline in total employment in the sector. This combination of factors produced a situation in which a smaller number of workers, enabled by larger amounts of capital, were able to build infrastructure and buildings more productively. Over the seven-year period, the capital-to-labour ratio increased by 63 per cent; total employment in the sector decreased by 24 per cent, and real GDP per worker increased by 5 per cent. As capital investment increased at a rate that was far greater than the rate of increase in productivity, the efficiency by which invested capital was translated into market value declined.

The accumulation of capital relative to labour that occurred over the seven-year period would suggest that the amount of investment required to create one job increased. That is to say, the investment cost of job creation within the construction sector increased, and, in turn, the sector's potential to augment GDP also increased. In 2016, an investment of JOD12,340 was necessary to create one job; whereas in 2009 an investment of JOD7,579 was required to create one job.

If these figures are accurate, then an investment of JOD1 million could be expected to require the entry of 81 workers into the construction sector. Assuming these workers were fully employed throughout the year, they would be expected to produce JOD1.79 million in value-added in buildings or infrastructure.

4. Manufacturing Sector Trends

4.1 Manufacturing in the Larger Economy

Manufacturing accounts for a relatively large share of Jordan's gross domestic product (GDP) – 19.15 per cent of inflation-adjusted output, or real GDP in 2016. The sector's share of the larger economy remained consistent over the time period between 2009 and 2016. Unlike agriculture and construction that were both subject to certain fluctuations in output, manufacturing grew steadily at an average real annual growth rate of 2 per cent, for a total of 15.2 per cent over the full seven-year period.

Table 5: Manufacturing GDP as a Share of Total GDP in Jordan, 2009-2016 (constant JOD millions; 2016 base year)³¹

	Gross Domestic Product	Manufacturing Gross Domestic Product	Manufacturing GDP Share
2009	23,315	4,627	19.85%
2010	23,934	4,720	19.72%
2011	24,611	4,911	19.95%
2012	25,134	5,026	20.00%
2013	25,722	5,123	19.92%
2014	26,592	5,199	19.55%
2015	27,272	5,269	19.32%
2016	27,830	5,329	19.15%

4.2 Manufacturing and Employment

4.2.1 Employment

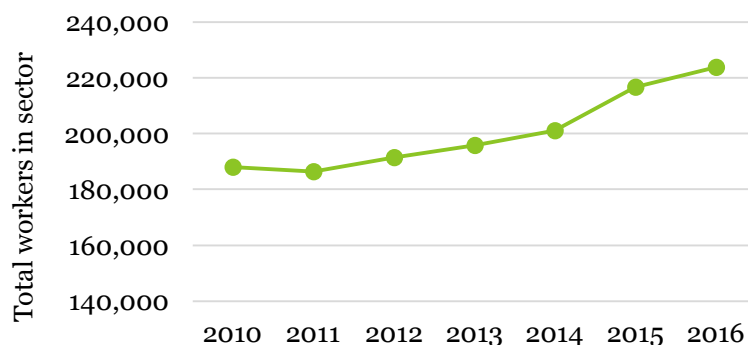
Manufacturing accounts for a moderate share of overall employment in Jordan – an average of 16.5 per cent over the 2000-2016 period and 17 per cent over the 2009-2016 period. Employment in this sector grew significantly over the past two decades. According to the Department of Statistics, a total of 223,868 persons was employed in manufacturing in 2016, nearly two times the number employed in 2000. Between 2009 and 2016, the number of workers employed in this sector grew by approximately 25 per cent.

Like agriculture, Jordan's manufacturing sector is characterised by a large proportion of foreign workers. In 2016, approximately 30 per cent of workers in the sector were non-Jordanian. Approximately 31 per cent of this expatriate worker cohort was comprised of Egyptians, and an additional 7 per cent of Syrians. The remaining 61 per cent were of non-Arab origin, from

³¹ The data in this table is from the Department of Statistics *Statistical Yearbook 2017*, p. 278.

countries including India, Sri Lanka, Bangladesh, Nepal and Myanmar. This large concentration of South Asian labour stems, in part, from the 14 industrial estates and special economic zones that are specialised in textile and apparel production. Between 2000 and 2016, the number of non-Arab manufacturing workers grew by 210 per cent.

Figure 5: Total employment in Jordan's manufacturing sector, 2010-2016



Jordan's manufacturing sector is characterised by a certain amount of labour informality, albeit to a smaller degree than the agriculture and construction sectors. The two studies conducted by the Ministry of Planning and International Cooperation (MOPIC) and the United Nations Development Programme (UNDP) estimated that 48.2 per cent of manufacturing workers were employed informally in 2010.³² The manufacturing sector accounted for less than 12 per cent of all informal employment in Jordan.³³

As in the construction sector, labour informality in manufacturing may be abating, as larger numbers of workers are slowly joining the social security system. Research conducted by the Economic Research Forum, found that the number of Jordanian manufacturing workers covered by social security rose from 60.3 per cent in 2010 to 63.8 per cent in 2016.³⁴

4.2.2 Labour Productivity

Labour productivity in manufacturing is defined as real GDP in the sector divided by the number of workers engaged in the sector. Between 2009 and 2016, real GDP per worker for manufacturing fell by nearly 6 per cent. Across the full seven-year period, labour productivity fell consistently year-on-year, with the exception of a short period of abbreviated growth in 2011. Falling productivity coincided with continuous employment growth as well as steady real GDP, or output growth for the sector. As discussed previously, between 2009 and 2016 real GDP for the manufacturing sector grew by approximately 15 per cent. Productivity declines alongside

³² MOPIC & UNDP, *The Informal Sector in the Jordanian Economy and The Panoramic Study of the Informal Economy*, 2012, <http://www.undp.org/content/dam/jordan/docs/Publications/Gov/The%20Informal%20Sector%20in%20the%20Jordanian%20Economy-jo.pdf>

³³ Ibid.

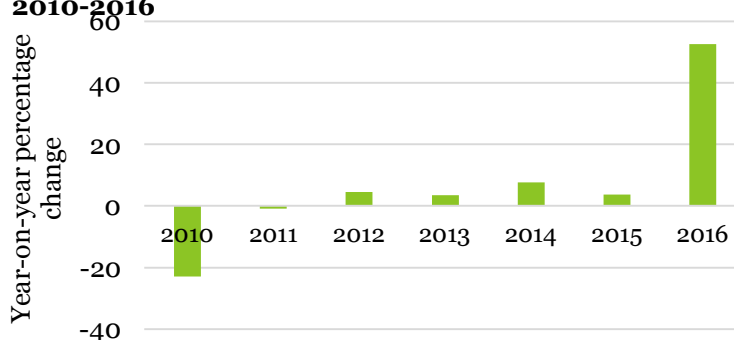
³⁴ Alhawarin and Selwaness, 'The Evolution of Social Security in Jordan's Labour Market: A Critical Comparison between Pre and Post-2010 Social Security Reform,' Working Paper No. 1185, Economic Research Forum, April 2018, pp. 12, 14, <http://erf.org.eg/publications/the-evolution-of-social-security-in-jordans-labor-market-a-critical-comparison-between-pre-and-post-2010-social-security-reform/>

employment growth suggest insufficient adoption of more advanced technology and/or the movement of labour to less productive areas of manufacturing activity.³⁵

4.3 Capitalisation of Manufacturing

Capitalisation, or investment, in the manufacturing sector consists of the acquisition of physical plants, infrastructure, machinery, equipment, and raw materials that facilitate or contribute to the production of physical goods. Greater amounts of capital investment should strengthen labour productivity. Between 2009 and 2016, the real value of invested capital in Jordan's manufacturing sector grew by an estimated 40.8 per cent, about 5.8 per cent on an average annual basis, despite declines in 2010 and 2011. In 2016 alone, the real value of capital stock in manufacturing grew by approximately 52 per cent. Although the sector experienced significant employment growth during this period, the real value of capital stock grew more rapidly. This resulted in a 15 per cent increase in the capital-labour ratio, underlying an important shift by which the manufacturing sector became more capital-intensive relative to the level of employment.

Figure 6: Changes in real value of net capital stock in Jordan's manufacturing sector, 2010-2016



4.4 Investing in Manufacturing

The previous sections illustrate how an expanding labour force has occurred alongside increasing per worker investment levels within the manufacturing sector. Per worker investment levels are reflected in the capital-to-labour ratio, which increased from JOD30,674 per worker in 2009 to JOD35,267 in 2016. At the same time, real output produced per worker declined, as reflected in a manufacturing real GDP-to-labour ratio of JOD23,804 in 2016 compared to JOD25,316 in 2009.

Thus, both investment and employment grew rapidly during the period with investment growth outpacing employment growth. While real GDP for the sector grew, it was not commensurate with the additional manpower and capital that accumulated over the period. All of this had the effect of a decreased return on investment. In 2009, for each Jordanian dinar invested, one manufacturing sector worker produced a market value of JOD0.83 worth of manufactured goods

³⁵ The calculated 'productivity elasticity of employment' for the seven-year period is -0.265. This is derived by dividing the total change in productivity (-5.9 per cent) by the total change in manufacturing employment (22.4 per cent). As the change in productivity is smaller than the change in employment, stagnant technical means and/or growth of relatively low productivity lines of production are implied.

or commodities. In 2016, for each Jordanian dinar invested one manufacturing sector worker produced a market value of JOD0.67 worth of manufactured goods or commodities.³⁶

Table 6: Capital-to-Labour and GDP-to-Labour Ratios in Manufacturing, 2009 and 2016 (constant JOD; 2016 base year)			
	Capital/ Labour Manufacturing (2016 JOD)	Manufacturing GDP/ Labour (2016 JOD)	Manufacturing GDP/ Labour to Capital/Labour
2009	30,674	25,316	0.83
2016	35,267	23,804	0.67
Changes	14.98%	-5.97%	

This suggests that from an economic perspective, over the period between 2009 and 2016, capital investment in Jordanian manufacturing became less efficient at producing market value. While in construction, larger amounts of capital per worker were successful in boosting output per worker, in manufacturing higher rates of capitalisation were associated with the opposite effect – decreased output per worker. This might be explained by certain capitalisation trends within the manufacturing sector. If investment was directed primarily towards ‘less-productive’ resources such as buildings and structures as opposed to machines, tools, and other inputs, then worker output would reap less benefit from the invested funds.

4.5 Key Conclusions

As discussed in previous sections, between 2009 and 2016, an increasing value of capital stock coincided with an increase in total employment in the sector and a reduction in output per worker. Thus, counterintuitively, a larger number of workers, enabled by larger amounts of capital, produced less output on a per worker basis. Over the seven-year period, the capital-to-labour ratio increased by 14.98 per cent; total employment in the sector increased by 22 per cent, and real GDP per worker fell by 5.97 per cent. As capital investment increased and labour productivity decreased, the efficiency by which invested capital was translated into market value declined.

The accumulation of capital relative to labour that occurred over the seven-year period would suggest that the amount of investment required to create one job increased. That is to say, the investment cost of job creation within the manufacturing sector increased, while the sector’s potential to augment GDP decreased. In 2016, an investment of JOD35,267 was necessary to create one job; whereas in 2009 an investment of JOD30,674 was required to create one job.

If these figures are accurate, then an investment of JOD1 million could be expected to require the entry of 28 workers into the manufacturing sector. Assuming these workers were fully employed throughout the year, they would be expected to produce JOD670,000 million in value-added in manufactured goods and commodities.

³⁶ The average GDP/Labour-to-Capital/Labour ratio of the 2009-2016 period was 1, higher than the 2016 value. Taking the average figure from across the seven-year period would suggest that approximately JOD1 in manufactured goods and commodities would have been produced for every JOD invested over the period.

5. Services Sector Trends

5.1 Services in the Larger Economy

Services account for a large share of Jordan's gross domestic product (GDP) – approximately 66.2 per cent in 2016.³⁷ Private services, which include communications, transportation, internal trade, finance, and a wide range of other activities accounted for an estimated 48 per cent according to Department of Statistics figures.³⁸ Given the breadth of the services sector, this report focuses specifically on those areas in which Syrian refugees have sought formal and informal employment. They include wholesale and retail trade, motor vehicle repair, food and beverage services, and accommodation. These categories of economic activity accounted for approximately 10 per cent of real GDP in 2016.³⁹ The selected services' share of the economy remained consistent over the time period between 2009 and 2016, with slight increases in 2012, 2013, and 2014. Real GDP, or output, for these activities grew by 17.7 per cent over the same period.

Table 7: Selected Services GDP as a Share of Total GDP in Jordan, 2009-2016 (constant JOD millions; 2016 base year)⁴⁰

	Gross Domestic Product	Select Services Gross Product	Select Services GDP Share
2009	23,315	2,330	9.99%
2010	23,934	2,307	9.64%
2011	24,611	2,376	9.65%
2012	25,134	2,536	10.09%
2013	25,722	2,615	10.17%
2014	26,592	2,710	10.19%
2015	27,272	2,715	9.96%
2016	27,830	2,743	9.86%

5.2 Services and Employment

5.2.1 Employment

These services account for a sizeable 23 per cent share of the Jordanian workforce, with employment rising significantly since the year 2000. According to Department of Statistics figures, wholesale and retail trade, motor vehicle repair, food and beverage services, and accommodation employed a total of 295,815 persons in 2016, compared to 188,428 in 2000, for an overall growth

³⁷ *Global Finance*, 'Jordan GDP and Economic Data,' January 2019, <https://www.gfmag.com/global-data/country-data/jordan-gdp-country-report>

³⁸ Alhajahmad & Lockhart, 'Jordan's Recent Economic Performance: Implications for Future, Investment, Refugee Policy and Refugees,' The WANA Institute, August 2017, http://wanainstitute.org/sites/default/files/publications/Publication_JordansRecentEconomicPerformance_English.pdf

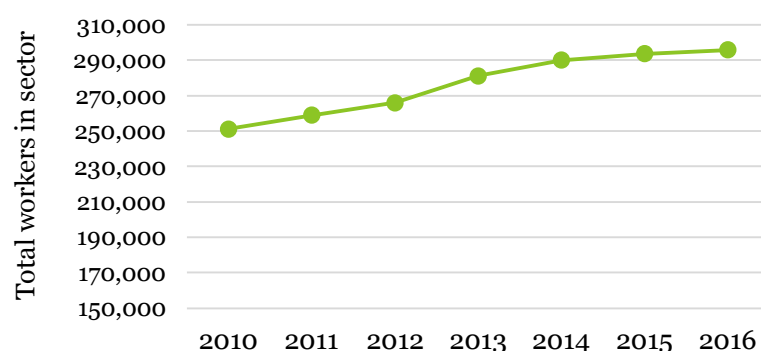
³⁹ The data is from the Department of Statistics Statistical Yearbook 2017, p 278.

⁴⁰ The data in this table is from the Department of Statistics *Statistical Yearbook 2017*, p. 278.

rate of 57 per cent. Between 2009 and 2016, employment in these activities grew at a rate of 19 per cent.

The selected services' activities are characterised by a relatively low participation rate of foreign, or expatriate, labour. In 2016, non-Jordanian workers accounted for approximately 11 per cent of overall labour in these selected services. In the period between 2000 and 2016, the presence of expatriate labour increased at a rate that was just slightly faster than the overall rate of employment growth for the selected services. In 2016, Egyptians accounted for approximately 70 per cent of foreign labour employed across wholesale and retail trade, motor vehicle repair, food and beverage services, and accommodation services while Syrians accounted for 19 per cent.

Figure 7 : Total Employment in selected services sector, 2010-2016



Like the agriculture and construction sectors, the selected services' activities are thought to be subject to high levels of labour informality. The MOPIC and UNDP estimated that 80.7 per cent of Jordanian workers engaged in these activities in 2010 were employed informally.⁴¹ An estimated 85.6 per cent of wholesale and retail trade and motor vehicle repair workers, and 50.5 per cent of food services and accommodation workers were found to be employed informally.⁴²

As in the construction and manufacturing sectors, the share of the selected services sector workers covered by social security appears to be on the rise. According to the Economic Research Forum study cited in previous sections, approximately 47.7 per cent of the selected services workers had social security coverage in 2016, compared to only 29 per cent in 2010.⁴³

5.2.2 Labour Productivity

Labour productivity in the selected services discussed in this report is defined as GDP for those services divided by the number of persons employed in the sector. Between 2009 and 2016, GDP per worker in selected services experienced a steady pattern of slight decline offset by periods of

⁴¹ MoPIC and UNDP *The Informal Sector in the Jordanian Economy*, n.d., pp. 32-33, 42.

⁴² Ibid.

⁴³ Alhawarin and Selwaness, 'The Evolution of Social Security in Jordan's Labour Market: A Critical Comparison between Pre and Post-2010 Social Security Reform,' Working Paper No. 1185, Economic Research Forum, April 2018, pp. 12, 14, <http://erf.org.eg/publications/the-evolution-of-social-security-in-jordans-labor-market-a-critical-comparison-between-pre-and-post-2010-social-security-reform/>

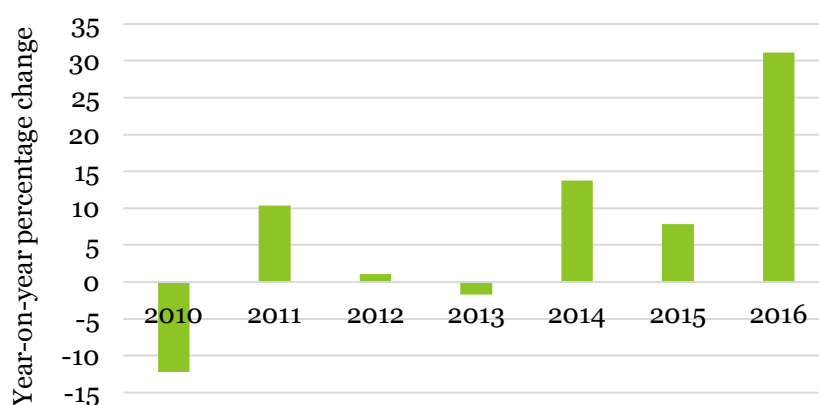
abbreviated growth in 2012 and 2016. Over the entire seven-year period, GDP per worker fell by approximately 1.3 per cent.

Falling productivity coincided with continuous employment growth as well as steady real GDP growth for the sector. As discussed previously, between 2009 and 2016, real GDP for the selected services grew by approximately 17.7 per cent. Productivity decline alongside employment growth signal insufficient adoption of more advanced technology and/or the movement of labour to less productive areas of selected services.⁴⁴

5.3 Capitalisation of Selected Services

Capitalisation in the selected services' sector consists of the purchase of physical buildings, transportation and office equipment, machinery, hotel and restaurant furniture, and –for wholesale and retail trade – stocks of inventory to be sold. Funds invested in these inputs should serve to boost the output and labour productivity of selected services' activities. The real value of invested capital in Jordan's wholesale and retail trade, repair of motor vehicles, food and beverage services, and accommodation activities rose by a significant 55 per cent between 2009 and 2016, with periods of abbreviated decline in 2010 and 2013. Although the sector experienced significant employment growth during this period, the real value of capital stock grew even more rapidly. This resulted in a 30 per cent increase in the capital-labour ratio, underlying an important shift by which the selected services sector became more capital-intensive relative to the level of employment.

Figure 8: Changes in the real value of net capital stock in selected services sector, 2010-2016



5.4 Investing in Selected Services

The above indicates expanding employment combined with increasing per worker investment levels in selected services' activities. Growth in investment levels outpaced growth in employment, as reflected in the capital-to-labour ratio, which increased from JOD9,626 per worker in 2009 to JOD12,499 in 2016. Simultaneously, real output produced per worker declined slightly, as reflected

⁴⁴ The calculated 'productivity elasticity of employment' for the seven-year period is -0.0679. This is derived by dividing the total change in productivity (-1.3 per cent) by the total change in employment in the combined services (19.2 per cent). As the change in productivity is smaller than the change in employment, stagnant technical means and/or growth of relatively low productivity lines of production are implied.

in a selected services real GDP-to-labour ratio of JOD9,306 in 2016 compared to JOD9,396 in 2009.

The combined increase in employment and capitalisation did not produce a commensurate increase in real output. All of this resulted in a decreased return on investment. In 2009, for each Jordanian dinar invested, one selected services sector worker produced a market value of JOD0.98. In 2016, for each Jordanian dinar invested, one services worker produced a market value of JOD0.74.⁴⁵

Table 8: Capital-to-Labour and GDP-to-Labour Ratios in Selected Services, 2009 and 2016 (constant JOD; 2016 base year)			
	Capital/ Labour Select Services (2016 JOD)	Selected Service GDP/ Labour (2016 JOD)	Selected Services GDP/ Labour to Capital/ Labour
2009	9,626	9,396	0.98
2016	12,499	9,273	0.74
Changes	29.85%	-1.3%	

From an economic perspective, over the period between 2009-2016, capital investment in selected services became less efficient at producing market value. While in construction larger amounts of capital per worker were successful in boosting output per worker, in selected services, higher rates of capitalisation were associated with the opposite effect—decreased output per worker. This might be explained by certain capitalisation trends within the selected services sector itself. If investment was directed primarily towards ‘less-productive’ resources, such as buildings and structures or stocks of goods rather than instruments to be used directly by workers to provide services, then worker output would reap less benefits from the invested funds.

5.5 Key Conclusions

Between 2009 and 2016, an increasing value of capital stock coincided with an increase in total employment in the service sectors and a reduction in output per worker. Thus, counterintuitively, a larger number of workers enabled by larger amounts of capital produced less output on a per worker basis. Over the seven-year period, the capital-to-labour ratio increased by 30 per cent; total employment in the sector increased by 19 per cent, and real GDP per worker fell by 1.3 per cent. As capital investment increased and labour productivity decreased, the efficiency by which invested capital was translated into market value declined.

The accumulation of capital relative to labour that occurred over the seven-year period would suggest that the amount of investment required to create one job increased. That is to say, the investment cost of job creation within the selected service sectors increased, while the sectors’

⁴⁵ The average GDP/Labour-to-Capital/Labour ratio of the 2009-2016 period was 1, higher than the 2016 value. Taking the average figure from across the seven-year period would suggest that approximately JOD1 in services would have been produced for every JOD invested over the period.

potential to augment GDP decreased. In 2016, an investment of JOD12,499 was necessary to create one job; whereas in 2009 an investment of JOD9,626 had been required to create one job.

If these figures are accurate, then an investment of JOD1 million could be expected to employ 80 workers in the selected services. Assuming these workers were fully employed throughout the year, they would be expected to produce JOD741,840 million in value-added in combined services.

6. Discussion & Conclusions

6.1 Sector Performance, 2009-2016

In the period 2009-2016, the agriculture, construction, manufacturing, and selected services sectors were each characterised by their own, unique set of dynamics. Agricultural GDP grew 14 per cent in real terms, despite a large reduction in employment (-49 per cent) and depletion of capital (-19 per cent). As workers withdrew from the sector, and investment levels grew relative to employment, worker productivity rose significantly (125 per cent).

Real GDP for the construction sector grew by 5 per cent during the period, alongside a large drawdown in employment (-24 per cent) and capitalisation growth (24 per cent). As capital levels surged relative to employment, productivity also grew, but not to the same degree as in the agriculture sector.

The manufacturing sector experienced overall real GDP growth (15.2 per cent) during the period, but a decline in productivity of 6 per cent as employment levels climbed and the additional workers were not associated with a commensurate increase in output. Investment levels in this sector also increased at a rate (40.8 per cent) that outpaced employment growth (22 per cent), but this accumulation of capital also did not translate into a proportionate increase in output.

Finally, real GDP for selected services – food and beverage services, accommodation, wholesale and retail trade, and motor vehicle repair – grew by 17.7 per cent in seven-year period. As in manufacturing, employment and investment levels also increased (by 19 and 55 per cent respectively), but neither the larger pool of workers, nor the accumulated capital were associated with a commensurate increase in average worker productivity; indeed, such productivity declined by approximately 1.3 per cent over the period as a whole.

Sector	Real GDP Growth	Employment Growth	Productivity Growth	Capitalisation Growth (2010-2016)	Capital-to-Labour Ratio Growth
Agriculture	14%	-49%	125%	-19%	58%
Construction	5%	-24%	38%	24%	63%
Manufacturing	15.2%	22%	-6%	40.8%	15%
Selected Services	17.7%	19%	-1.3%	55%	30%

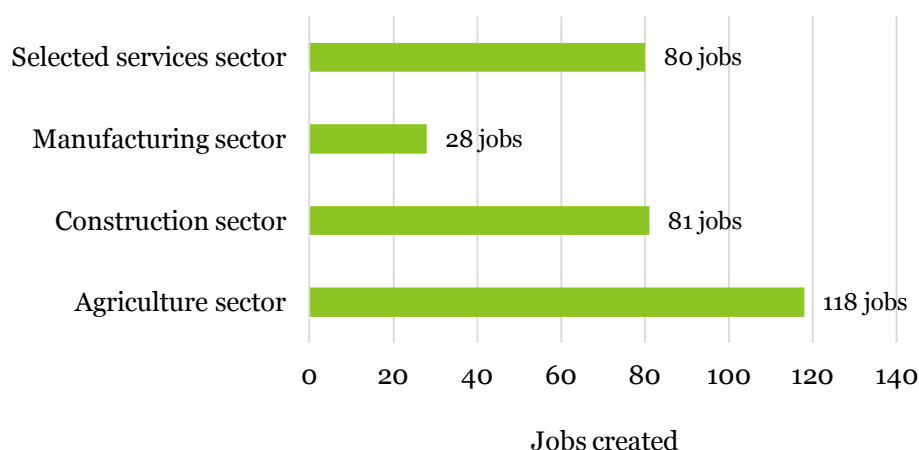
6.2 Policy Implications for Jordan

The above dynamics present a host of implications for employment creation, GDP growth and return on investment. While each of these perspectives will be discussed separately, they are intricately connected and may not be considered in isolation.

6.2.1 Employment Creation

Based on the data presented above, investing in agriculture appears to be the most effective way to both boost employment and GDP with manufacturing being the least effective in the cost/benefit analysis. These results are not surprising given the common assumption that the start-up costs associated with manufacturing greatly exceed those of agriculture. In line with these figures, we might conclude that additional investment in agriculture would have resulted in additional jobs. However, we must also bear in mind that in 2016, foreign workers – including Syrians – accounted for approximately 70 per cent of all employment in the agriculture sector. While investing in this sector may have created employment for Syrian refugees, it would not have had a significant effect on Jordanian employment.

Figure 9: Employment created with JOD one million investment by sector



As demonstrated in Figure 9, increased investment in the remaining sectors is expected to produce less of an employment impact. The additional demand for labour in construction would have been beneficial to both Jordanian and foreign workers, as the former accounted for 76 per cent and the latter accounted for approximately 24 per cent of employment in the sector. Increased investment in selected services would have brought disproportionate benefits to Jordanian workers, as these activities are characterised by a high concentration-- approximately 89 per cent-- of Jordanian labour content. Increased investment in the manufacturing sector would have led to the creation of far fewer jobs than any of the other sectors, although a large proportion of these jobs – as many as 70 per cent – might be filled by Jordanian workers.⁴⁶

⁴⁶ According to Department of Statistics figures, Jordanian workers accounted for 70 per cent of employment within the manufacturing sector, and foreign labour accounted for the remaining 30 per cent, see Annex 3, Table 20.

In all cases reviewed, capital investment and capital accumulation have tended to outpace employment growth resulting in higher capital-to-labour ratios over time. This logically raises the initial average investment level needed to employ additional workers in all sectors. While the evidence from the agricultural sector suggests larger initial employment impacts for additional investments, the sector is not exempt from the dynamic of rising capital-to-labour ratios.

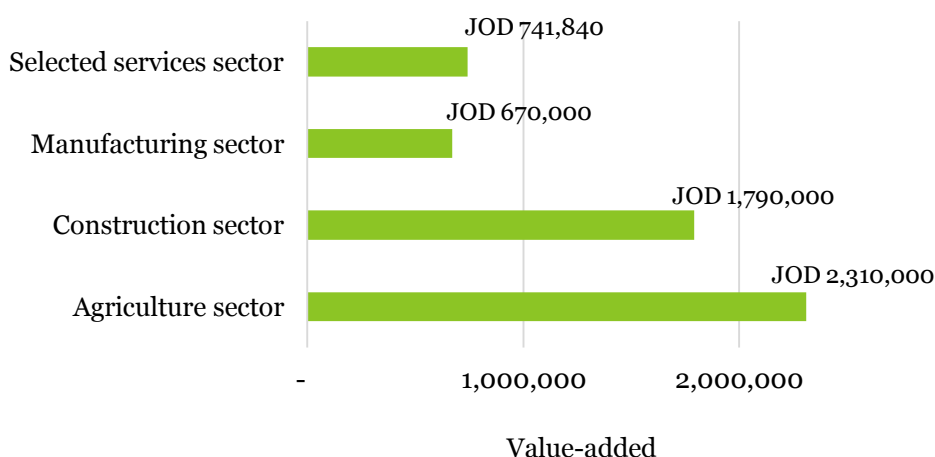
6.2.2 GDP/Value-Added and Return on Investment

As is the case of employment impact, it appears that agriculture has the greatest potential to contribute to GDP as compared to the other three sectors: the economic return on investment in agriculture was higher than that for construction, manufacturing and the selected services. That is, every Jordanian dinar invested in agriculture produced a greater market value of additional output relative to the other sectors.

To directly respond to the hypothetical question posed in this report’s introduction, additional investments in all sectors would have had a positive impact on GDP. However, additional funds invested would have contributed more in agriculture than in construction, selected services, and manufacturing.

Still, as we have noted with employment, a strategy to stimulate growth by boosting investment may become less effective over time, particularly if capital accumulation in the sector does not produce a comparable increase in real GDP. Construction, manufacturing, and selected services are all, in a way, examples of this. Between 2009 and 2016, each of these sectors experienced significant growth in capitalisation, and in each the economic return on investment declined. That is, in 2016, a Jordanian dinar invested in construction, manufacturing, and selected services produced comparatively less in output than a dinar would have produced if invested in 2009.

Figure 10: Value-added created with JOD one million in sector-targeted investment



6.2.3 Key Take-Aways

All of this indicates that Jordan's agriculture sector may deserve greater attention than it has recently received. The evidence presented above indicates the sector has undergone important structural changes in recent years and suggests that there may be space for additional productivity gains. Targeted investments in water-saving technologies might serve to reduce Jordan's dependence on food imports^{47/48} while generating cost-effective employment gains and GDP growth.

This is not to say that services, manufacturing, and construction should be overlooked by policy-makers and investors. The growth that has been achieved in each of these sectors is noteworthy, and each makes an important contribution to the fabric of Jordan's economy. Still, the figures discussed in the previous sections flag a couple of trends that merit further consideration.

Firstly, falling productivity within the manufacturing sector should be a cause for concern. While attracting investment will remain a key priority, policy-makers should find ways to focus on investment absorption – particularly the adoption of productivity-enhancing investments whether these are technological or organizational in nature.

Secondly, as the numbers demonstrate, services are significantly less capital-intensive than manufacturing. The potential of that sector to contribute to employment for a relatively smaller upfront investment should be highlighted. The limited ability of services sector businesses to achieve the economies of scale that boost per employee profits and allow for higher wages is an economic reality.⁴⁹ However, in the case of Jordan, the integration of information communications technology (ICT) across non-tradeable service sector activities offers a means of advancing productivity above and beyond current levels.

6.3 Refugee Policy and Future Applications

The evidence and discussion in this report provide a cost-benefit framework for considering investment in key sectors. This framework can also serve as a tool for squaring refugee livelihood priorities with the development priorities of the host state. Given the integral role that the host state plays in the refugee hosting architecture, a scenario in which policy-makers and practitioners ignore development priorities is improbable. This raises several questions: in which sector is investment translated into market value most efficiently?; if employment is created in a given sector, how are the benefits as between host communities and refugees distributed?; which sectors

⁴⁷ Jordan imports up to 98 per cent of consumable items from abroad, including wheat barley, sugar, rice, powdered milk, and a wide range of other products.

Jordan Country Commercial Guide, <https://www.export.gov/article?id=Jordan-Agricultural-Sectors>

⁴⁸ Jordan's dependence on imports is a threat to food security, while 6.6 per cent of the population suffers from food insecurity.

Ibañez-Prieto, Ana; 'Jordan's dependence on imports threatens its food security—experts,' *The Jordan Times*, November 2018, <http://www.jordantimes.com/news/local/jordans-dependence-imports-threatens-its-food-security---experts>

⁴⁹ Services businesses such as hotels and restaurants are characterised by limited economies of scale, low productivity, and low per employee profits. These businesses maintain profitability by paying low wages.

Porter, Eduardo; 'Tech is Splitting the US Workforce in Two,' *The New York Times*, February 4, 2019 <https://www.nytimes.com/2019/02/04/business/economy/productivity-inequality-wages.html>

have been deemed strategic for the host state economy, and what are the other notable development priorities (e.g. exports, food security, conservation of natural resources, etc.)? Sector GDP growth, employment, productivity, and capitalisation estimates provide a robust quantitative framework with which policymakers can usefully assess these questions.

Wage considerations must also be taken into account. In the case of Jordan, the average wage for a Syrian refugee employed in the agriculture sector is far below the minimum monthly expenditure basket for a household of 4,⁵⁰ and well below the average wage of Syrian refugees employed in the manufacturing, construction, and selected services sectors.⁵¹ A sector's potential to contribute to employment and GDP must be considered in line with that sector's ability to create sustainable livelihoods for the target population. In the Jordanian context, investment in the selected services sector appears to be better aligned with the dual priority of boosting employment for the host population while also paving the way towards meaningful livelihoods for Syrian refugees until conditions permit their safe repatriation.

⁵⁰ In 2017, the minimum expenditure basket for a Syrian refugee household of four was JOD399.

UNHCR Minimum Expenditure Basket 2017, <https://reliefweb.int/sites/reliefweb.int/files/resources/MEB2017.pdf>

⁵¹ The average monthly wage for Syrians employed in the agriculture sector in 2016 was JOD97, compared to JOD231 in the manufacturing sector, JOD179 in the construction sector, JOD204 in the accommodation and food services sector, and JOD184 in the wholesale and retail trade sector.

See WANA Institute, 'The Syrian Refugee Crisis and its Impact on the Jordanian Labour Market.'

7. Annex 1: Agriculture Sector Tables

Table 10: Agricultural Employment by Activities and Citizenship in Jordan, 2000-2016⁵²

	Livestock		Field Crops		Total Employment		Grand Total
	Jordanian	Foreign	Jordanian	Foreign	Jordanian	Foreign	
2000	39,840	8,910	63,208	50,774	103,048	59,684	162,732
2001	32,460	8,320	15,696	30,981	48,156	39,301	87,457
2002	37,640	8,290	17,845	46,206	55,485	54,496	109,981
2003	48,100	6,590	11,863	24,087	59,963	30,677	90,640
2004	53,620	7,560	32,374	41,550	85,994	49,110	135,104
2005	52,180	7,720	29,021	39,995	81,201	47,715	128,916
2006	44,010	9,410	33,327	54,694	77,337	64,104	141,441
2007	38,350	9,790	27,176	43,067	65,526	52,857	118,382
2008	86,080	11,030	17,948	49,755	104,028	60,785	164,813
2009	71,250	8,990	22,562	45,086	93,812	54,076	147,888
2010	45,770	17,170	24,681	36,676	70,451	53,846	124,297
2011	37,560	12,800	22,008	41,770	59,568	54,570	114,138
2012	42,290	13,700	16,814	27,960	59,104	41,660	100,764
2013	42,685	13,980	12,003	52,093	54,688	66,073	120,761
2014	43,080	14,260	12,894	25,196	55,974	39,456	95,430
2015	39,960	17,590	13,750	32,461	53,710	50,051	103,761
2016	11,120	7,840	11,460	44,485	22,580	52,325	74,905
Average	45,059	10,821	22,625	40,402	67,684	51,223	118,906

Table 11: Registered Expatriate Workers and Registered Expatriates in Agriculture by Nationality, 2017⁵³

	Registered Expatriate Workers	<i>of which: Agriculture</i>	<i>of which: Egyptian</i>	<i>of which: Syrian</i>
Total	340,995	81,691	58,375	19,944
Males	258,352	79,685	58,186	18,241
Females	82,643	2,006	189	1,703
Shares of Totals	100.00%	23.96%	71.46%	24.41%

⁵² The data in this table is from the Department of Statistics as provided to WANA Institute, October 2018.

⁵³ Department of Statistics *Jordan Statistical Yearbook, 2017*, number 68, n.d., p. 56. The data in this table refers to the number of work permits issued and does not necessarily indicate actual employment. Anecdotal information suggests that workers with agriculture permit find employment in other activities, mainly in the large cities.

Table 12: Real GDP, Employment and GDP per Worker in Agriculture in Jordan, 2009-2016⁵⁴			
	Agriculture GDP (JOD millions)	Employment in Agriculture	Agriculture GDP/ Employment in Agriculture (JOD 2016 prices)
2009	1,282	147,888	8,669
2010	1,371	124,297	11,030
2011	1,425	114,138	12,485
2012	1,291	100,764	12,812
2013	1,246	120,761	10,318
2014	1,340	95,430	14,042
2015	1,406	103,761	13,550
2016	1,460	74,905	19,491
Averages	1,353	110,243	12,800

Table 13: Estimated Nominal and Real Value of Capital Stock in Agriculture in Jordan, 2009-2016⁵⁵				
	Nominal Average Value of Net Capital Stock in Agriculture (JOD)	Wholesale Price Index for Agricultural Inputs (2016=100)	Real Average Value of Net Capital Stock in (2016 JOD)	Changes in the Real Average Value of Net Capital Stock in Agriculture
2009	581,726,674	0.736	790,086,802	--
2010	581,819,240	0.817	712,245,111	-9.85%
2011	578,471,367	0.871	663,796,098	-6.80%
2012	575,568,705	0.927	620,891,336	-6.46%
2013	579,248,663	0.955	606,261,563	-2.36%
2014	589,665,102	0.978	602,754,448	-0.58%
2015	602,072,010	0.998	603,337,754	0.10%
2016	633,334,146	1.000	633,334,146	4.97%

⁵⁴ The agriculture GDP data is from the Department of Statistics *Statistical Yearbook 2017*, p. 278. The data on agricultural employment is from Department of Statistics as provided to WANA.

⁵⁵ The capital stock data in this table is from the Department of Statistics as provided to the WANA Institute, October 2018.

Table 14: Estimated Real Capital-to-Labour Ratios in Jordanian Agriculture, 2009-2016 in 2016 JOD⁵⁶			
	Real Average Value of Net Capital Stock in Agriculture (2016 JOD)	Total Agricultural Employment	Capital-to-Labour Ratios (2016 JOD)
2009	790,086,802	147,888	5,342
2010	712,245,111	124,297	5,730
2011	663,796,098	114,138	5,816
2012	620,891,336	100,764	6,162
2013	606,261,563	120,761	5,020
2014	602,754,448	95,430	6,316
2015	603,337,754	103,761	5,815
2016	633,334,146	74,905	8,455
Averages	654,088,407	110,243	6,082

⁵⁶ The data in the second and third columns of Table 7 is from Tables 6 and 1 respectively.

8. Annex 2: Construction Sector Tables

Year	Jordanian	Foreign	Total
2000	17,050	6,329	23,379
2001	18,742	6,281	25,023
2002	17,389	8,518	25,907
2003	14,449	6,676	21,125
2004	17,009	7,618	24,627
2005	21,342	8,072	29,414
2006	16,487	10,986	27,473
2007	17,888	12,103	29,991
2008	27,784	19,132	46,916
2009	32,920	18,259	51,179
2010	31,329	14,776	46,105
2011	31,970	18,160	50,130
2012	32,103	16,698	48,801
2013	27,202	11,367	38,569
2014	29,303	10,649	39,952
2015	27,863	9,361	37,224
2016	29,537	9,288	38,825
Averages	24,139	11,428	35,567

	Registered Expatriate Workers	of which: Construction	of which: Egyptian	of which: Syrian
Total	340,995	34,905	25,601	7,784
Males	258,352	34,780	25,491	7,781
Females	82,643	125	110	3
Shares of Totals	100.00%	10.24%	73.34%	22.30%

⁵⁷ The data in this table is from the Department of Statistics (DOS) as provided to WANA Institute, October 2018.

⁵⁸ Department of Statistics *Jordan Statistical Yearbook, 2017*, number 68, n.d., p. 56. The data in this table refers to the number of work permits issued and does not necessarily indicate actual employment. It is noteworthy that the Ministry of Labour issued only 2,428 work permits to Syrians in 2012, rising to 5,552 in 2015. In 2016, as a result of the agreement with the European Union to expand work opportunities for Syrian refugees in Jordan – the so-called ‘Jordan Compact’ – the number of permits for Syrians jumped to a total of 36,790. See Jordan Ministry of Labour *Jordanian Labour Market in Numbers, 2012-2016*, June 2017, p. 29. Total work permits for Syrian refugees surpassed 100,000 in 2018. See <http://www.jordantimes.com/news/local/jordan-issues-more-100000-work-permits-syrians>

Table 16 does not reflect the issuance of some 16,000 ‘flexible’ construction work permits to Syrian refugees in 2017. Flexible permits allow a worker to move from employer to employer without re-registering with the Ministry of Labour. See <http://www.jordantimes.com/news/local/16000-flexible-construction-work-permits-issued-syrian-refugees-2017>

	Construction Real GDP (JOD millions, constant prices)	Construction Employment	Construction GDP/ Employment (JOD, 2016 Prices)
2009	821	51,179	16,042
2010	783	46,105	16,983
2011	750	50,130	14,961
2012	743	48,801	15,225
2013	807	38,569	20,924
2014	862	39,952	21,576
2015	851	37,224	22,862
2016	860	38,825	22,151
Averages	810	43,848	18,464

	Nominal Average Value of Net Capital Stock in Construction (JOD)	Wholesale Price Index for Construction Inputs (base year=2016)	Real Average Value of Net Capital Stock in Construction (2016 JOD)	Changes in the Real Average Value of Net Capital Stock in Construction
2009	398,867,000	1.0283	387,884,294	--
2010	378,491,000	1.0495	360,626,225	-7.03%
2011	413,888,000	1.0632	389,291,694	7.95%
2012	384,191,000	1.0768	356,780,882	-8.35%
2013	412,046,000	1.0747	383,395,927	7.46%
2014	445,543,500	1.0957	406,622,459	6.06%
2015	352,276,000	1.0453	336,996,559	-17.12%
2016	479,115,000	1.0000	479,115,000	42.17%

⁵⁹ The construction GDP data is from the Department of Statistics *Statistical Yearbook 2017*, p. 278. The data on construction employment is from Department of Statistics as provided to WANA.

⁶⁰ The capital stock data in this table is from the Department of Statistics as provided to the WANA Institute, October 2018.

Table 19: Estimated Real Capital-to-Labour Ratios in Construction in Jordan, 2009-2016 in 2016 JOD⁶¹

	Real Average Value of Net Capital Stock in Construction (2016 JOD)	Total Construction Employment	Capital-to-Labour Ratios (2016 JOD)
2009	387,884,294	51,179	7,579
2010	360,626,225	46,105	7,822
2011	389,291,694	50,130	7,766
2012	356,780,882	48,801	7,311
2013	383,395,927	38,569	9,941
2014	406,622,459	39,952	10,178
2015	336,996,559	37,224	9,053
2016	479,115,000	38,825	12,340
Averages	387,589,130	43,848	8,839

⁶¹ The data in the second and third columns of Table 19 is from Tables 15 and 18 respectively.

9. Annex 3: Manufacturing Sector Tables

	Jordanian	Foreign	<i>of which: Egyptian</i>	<i>of which: Syrian</i>	Total
2000	110,768	15,462	12,358	1,274	126,230
2001	107,369	14,996	11,889	562	122,365
2002	103,272	12,573	9,194	775	115,845
2003	119,442	19,311	13,604	1,239	138,753
2004	131,202	35,771	18,113	630	166,973
2005	132,792	44,919	20,831	718	177,711
2006	117,448	52,337	18,667	1,198	169,785
2007	124,659	47,502	18,328	739	172,161
2008	122,853	48,922	21,994	778	171,775
2009	125,702	57,068	24,331	1,264	182,770
2010	129,516	58,500	22,877	1,226	188,016
2011	148,203	38,313	21,099	1,181	186,516
2012	144,471	46,915	20,950	3,303	191,386
2013	143,756	52,172	19,307	2,181	195,928
2014	140,319	60,755	23,890	2,755	201,074
2015	148,874	67,772	23,131	3,680	216,646
2016	156,815	67,053	20,832	5,456	223,868
Average	129,851	43,549	18,906	1,703	173,400

	Registered Workers	<i>of which: Manufacturing</i>	<i>of which: Egyptian</i>	<i>of which: Syrian</i>
Total	340,995	93,412	23,423	4,715
Males	258,352	59,917	23,288	4,624
Females	82,643	33,495	135	91
Shares of Totals	100.00%	27.4%	25.0%	5.0%

⁶² The data in this table is from the Department of Statistics (DOS) as provided to the WANA Institute, October 2018.

⁶³ Department of Statistics *Jordan Statistical Yearbook, 2017*, number 68, n.d., p. 56. The data in this table refers to the number of work permits issued and does not necessarily indicate actual employment.

Table 22: Real GDP, Employment and GDP per Worker in Manufacturing in Jordan, 2009-2016⁶⁴			
	Manufacturing Real GDP (JOD millions, constant prices 2016 base year)	Manufacturing Employment	Manufacturing Real GDP/ Manufacturing Employment (JOD)
2009	4,627	182,770	25,316
2010	4,720	188,016	25,104
2011	4,911	186,516	26,330
2012	5,026	191,386	26,261
2013	5,123	195,928	26,147
2014	5,199	201,074	25,856
2015	5,269	216,646	24,321
2016	5,329	223,868	23,804
Averages	5,026	198,276	25,346

Table 23: Estimated Nominal and Real Value of Capital Stock in Manufacturing in Jordan, 2009-2016⁶⁵ (constant JOD; 2016 base year)				
	Nominal Average Value of Net Capital Stock in Manufacturing (JOD)	Producer Price Index for Manufacturing Inputs (2016=100)	Real Average Value of Net Capital Stock in Manufacturing (2016 JOD)	Changes in the Real Average Value of Net Capital stock in Manufacturing
2009	5,274,945,500	0.9409	5,606,197,057	--
2010	4,134,384,500	0.9568	4,321,258,679	-22.92%
2011	4,752,614,000	1.1088	4,286,309,516	-0.81%
2012	5,107,662,500	1.1409	4,476,882,031	4.45%
2013	5,201,374,500	1.1226	4,633,504,112	3.50%
2014	5,464,774,000	1.0955	4,988,385,509	7.66%
2015	5,616,431,500	1.0850	5,176,626,282	3.77%
2016	7,895,234,000	1.0000	7,895,234,000	52.52%

⁶⁴ The manufacturing GDP data is from the Department of Statistics *Statistical Yearbook 2017*, p. 278. The data on manufacturing employment is from Department of Statistics as provided to the WANA Institute.

⁶⁵ The capital stock data in this table is from the Department of Statistics as provided to the WANA Institute, October 2018. Nominal value of capital stock for any year is calculated as the average book value of all capital assets, i.e. the average of the book value at the beginning and end of each year. The producer price index for manufacturing inputs is from the Department of Statistics at: http://jorinfo.dos.gov.jo/PXWeb2014R2/Selection.aspx?px_path=-&px_tableid=Table2_PPI_eng2.px&px_language=en&px_db=Consumer&rxid=89486a61-b62a-4a90-83ae-b26d09cadccc. The producer price index is based on 2010 prices. The index in this table has been rebased using 2016 as the base year.

Table 24: Estimated Real Capital-to-Labour Ratios in Manufacturing in Jordan, 2009-2016 ⁶⁶			
	Real Average Value of Net Capital Stock in Manufacturing (2016 JD)	Total Manufacturing Employment	Manufacturing Capital-to-Labour Ratios (2016 JD)
2009	5,606,197,057	182,770	30,674
2010	4,321,258,679	188,016	22,983
2011	4,286,309,516	186,516	22,981
2012	4,476,882,031	191,386	23,392
2013	4,633,504,112	195,928	23,649
2014	4,988,385,509	201,074	24,809
2015	5,176,626,282	216,646	23,894
2016	7,895,234,000	223,868	35,267
Averages	5,173,049,648	198,276	26,090

⁶⁶ The data in the second and third columns of Table 24 is from Tables 22 and 23 respectively.

10. Annex 4: Selected Services Tables

	Jordanian	Foreign	<i>of which Egyptian</i>	<i>of which: Syrian</i>	Total
2000	165,479	22,949	18,525	1,689	188,428
2001	157,471	14,942	11,957	1,040	172,413
2002	157,889	15,906	12,221	736	173,795
2003	186,248	19,168	16,530	822	205,416
2004	242,385	20,266	17,238	611	262,651
2005	217,924	22,394	19,582	984	240,318
2006	203,982	29,785	23,583	1,940	233,767
2007	203,848	30,888	27,001	1,873	234,736
2008	207,517	31,045	26,000	700	238,562
2009	211,552	36,431	28,644	2,587	247,983
2010	218,416	32,810	27,420	2,078	251,226
2011	220,556	38,440	31,010	1,578	258,996
2012	233,790	32,157	24,011	2,829	265,947
2013	249,494	31,615	20,071	4,980	281,109
2014	245,821	44,241	31,559	7,056	290,062
2015	262,602	31,040	21,435	5,570	293,642
2016	264,119	31,696	22,264	6,161	295,815
Averages	214,653	28,575	22,297	2,543	243,227

	Registered Workers	<i>of which: Selected Services</i>	<i>of which: Egyptian</i>	<i>of which: Syrian</i>
Total	340,995	46,195	34,537	7,011
Males	258,352	45,109	34,316	6,926
Females	82,643	1,086	221	85
Shares of Totals	100.00%	13.55%	74.76%	15.18%

⁶⁷ Data in this table is from the Department of Statistics (DOS) as provided to the WANA Institute, October 2018.

⁶⁸ Department of Statistics *Jordan Statistical Yearbook, 2017*, number 68, n.d., p. 56. The data in this table refers to the number of work permits issued and does not necessarily indicate actual employment.

Table 27: Real GDP, Employment and GDP per Worker in Selected Services in Jordan, 2009-2016⁶⁹ (GDP in constant JOD millions; GDP per worker in JOD; 2016 base year)			
	Select Services Real GDP (JOD millions)	Select Services Employment	Select Services GDP/ Select Services Employment (JOD)
2009	2,330	247,983	9,396
2010	2,307	251,226	9,183
2011	2,376	258,996	9,174
2012	2,536	265,947	9,536
2013	2,615	281,109	9,302
2014	2,710	290,062	9,343
2015	2,715	293,642	9,246
2016	2,743	295,815	9,273
Averages	2,542	273,098	9,306

Table 28: Estimated Nominal and Real Value of Capital Stock in Selected Services in Jordan, 2009-2016⁷⁰ (constant JOD; 2016 base year)				
	Nominal Average Value of Net Capital Stock In Selected Services (JOD)	Wholesale Price Index for Selected Services Inputs (2016=100)	Real Average Value of Net Capital Stock in Selected Services (2016 JOD)	Changes in the Real Average Value of Net Capital Stock in Selected Services
2009	2,106,546,000	0.8825	2,387,020,130	--
2010	1,917,173,500	0.9149	2,095,409,105	-12.22%
2011	2,198,355,000	0.9509	2,311,863,383	10.33%
2012	2,324,014,000	0.9941	2,337,840,997	1.12%
2013	2,328,431,000	1.0133	2,297,881,108	-1.71%
2014	2,700,602,500	1.0332	2,613,712,237	13.74%
2015	2,960,803,500	1.0500	2,819,742,520	7.88%
2016	3,697,501,500	1.0000	3,697,501,500	31.13%

⁶⁹ The selected services GDP data is from the Department of Statistics *Statistical Yearbook 2017*, p. 278. Data on selected services employment is from Department of Statistics as provided to the WANA Institute.

⁷⁰ The capital stock data in this table is from the Department of Statistics as provided to the WANA Institute, October 2018.

Table 29: Estimated Real Capital-to-Labour Ratios in Selected Services in Jordan, 2009-2016 in 2016 JOD⁷¹

	Real Average Value of Net Capital Stock in Selected Services (2016 JOD)	Total Selected Services Employment	Selected Services Capital-to-Labour Ratio (2016 JOD)
2009	2,387,020,130	247,983	9,626
2010	2,095,409,105	251,226	8,341
2011	2,311,863,383	258,996	8,926
2012	2,337,840,997	265,947	8,791
2013	2,297,881,108	281,109	8,174
2014	2,613,712,237	290,062	9,011
2015	2,819,742,520	293,642	9,603
2016	3,697,501,500	295,815	12,499
Averages	2,570,121,372	273,098	9,411

⁷¹ The data in the second and third columns of Table 29 is from Tables 25 and 28 respectively.



West Asia-North Africa Institute
Royal Scientific Society
70 Ahmad Al-Tarawneh St
Amman, Jordan

info@wana.jo
www.wanainstitute.org