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Article

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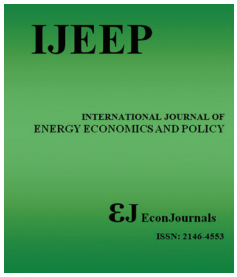

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Effect of COVID-19 on Energy Sector in Jordan

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ABSTRACT

This study aims to analyze the impact of the COVID-19 on the energy sector in Jordan. The steps taken by the Jordanian governments to mitigate the economic and financial impacts that would enhance the resilience of the energy sector was considered. Deductive and inductive analysis methods were used. Such methods aided to systematically consider the economic consequences of the COVID-19. The results of this study showed that the COVID-19 led to a significant decrease in energy consumption, a decline in economic growth, a significant rise in unemployment, an increase in market instability, and a decrease in the financial position of companies. The recommendations concluded that Jordan should begin to change its policies according to the new data, and take measures to advance the energy sector by reducing fuel consumption and directing investment in energy saving policies and infrastructure equipment in parallel with the population boom in Jordan.

Keywords: COVID-19, Energy Sector, National Policy
JEL Classifications: K32, Q4

1. INTRODUCTION

In late 2019, the coronavirus SARS-CoV-2 was discovered in Wuhan/China where the number of cases of COVID-19 disease increased by tens of thousands a day. Since then, the disease has developed into a pandemic with large outbreaks in South Korea, Iran, and the United States. So the world is currently living in a COVID-19 with a post-COVID-19 world on the horizon. Good social research will lead to a better understanding of not only COVID-19's current social impact, but also any future or new impacts. The findings will have immediate and long-term implications for policy and service delivery and development to better support the public as they deal with and recover from the numerous challenges to their way of life and health status that they are experiencing. They will also suggest strategies for dealing with and managing new large-scale health crises in an ethical and effective manner (Subedi, 2020). Since the beginning of 2020 the world has witnessed an unprecedented health crisis, as the Corona pandemic affected most economies in the world, which was reflected in multiple precautionary measures in their monetary and financial policies (Worldbank, 2020). Most countries entered in a recession as a result of the pandemic, with per capita income falling in the largest percentage of countries since 1870. The advanced economies contracted by 7%. As a result of this weakness, emerging market and developing economies contracted by 2.5% as they deal with their own domestic outbreaks of the virus. The crisis emphasizes the need for immediate action to mitigate the pandemic's health and economic effects, protect vulnerable populations, and lay the groundwork for a long-term recovery.

The energy sector in the Middle East is facing emergency risks as a result of recent energy market fluctuations and economic uncertainty caused by the outbreak of the "Corona" virus. This will have a negative impact on the sector's vitality as it will have negative repercussions on the region's energy supply chains, including production. Most countries around the world are continuing to take precautionary measures such as restricting

travel and movement of people, as well as suspending international aviation, in an effort to contain the spread of the "Corona" virus. This coincides with the closure of many companies and production units, resulting in a drop in consumption. Oil and natural gas are examples of global energy (IEA, 2020). As such, expectations go that global demand for crude oil will decrease by at least 3 million barrels per day. Other scenarios indicate that global consumption may contract sharply by more than 10%, equivalent to 10 million barrels. In the same vein, liquefied gas exports from the region are expected to slow significantly, owing to the expected contraction of the global industrial and transportation sectors. In the first preliminary indications in this regard, Indian and Chinese energy companies - among their most important suppliers are Middle Eastern countries - declared a case of force majeure in importing liquefied gas, implying that there are force majeure conditions that prevent the import of crude. The continued decline in oil prices will put significant strain on the revenues of Middle Eastern oil exporting countries. According to the Institute of International Finance, if the average price of a barrel of oil is $40, oil exporters in the Middle East and North Africa will lose $192 billion in revenue, or 11% of GDP, which will have disastrous consequences on the region companies (Future, 202).

The Jordanian government imposed a national lockdown on March 21, 2020, in an effort to halt the virus's spread, resulting in severe economic consequences for the region. During the lockdown, the government enforced precautionary measures around the nation. This resulted in lower electricity consumption and, as a result, lower average demand in the energy market. In Jordan, the COVID-19 interventions had an immediate effect on energy demand, which was expressed in regular profiles and consumer prices. In particular, as compared to daily pre-lockdown consumption curves, the forced shutdown of factories and tertiary operations greatly flattened the working hour consumption curves. Despite the fact that many people were working from home by smart working, the increase in residential usage did not compensate for the overall decrease in demand (Ghiani et al., 2020). Jordanian Public Statistics Department (JPSD) issued a report showing an increase in the unemployment rate in Jordan to 24.7% in the fourth quarter of 2020% (Jamal, 2020). Beyond its immediate health consequences, the current crisis has far-reaching implications for global economies, energy consumption, and CO2 emissions. Countries in full lockdown have a weekly decrease in energy demand of 25%, while countries in partial lockdown have a weekly decrease of 18%. Data collected on a regular basis for 30 countries, covering more than two-thirds of global energy consumption, shows that demand declines depending on the length and severity of lockdowns.

The recent disclosure for the Jordan Petroleum Refinery Company (JPRC), which is one of the largest companies operating in the Kingdom, showed that it is on the verge of financial losses in the first half of year 2020 for the first time since long years (Al-Radawi, 2020). The refinery's losses this time are not a result of the company's business and its operational activities, but rather it is a result of the application of accounting standards based on taking the valuation differences between its stock balance at the end of 2019 with its balance at the end of June 2020. At a value of about 122 million dinars, as the prices decreased during the first half period to less than 25 dollars per barrel, which required the management of the company to take allocations. The necessary for this significant decrease as a result of the differences in the valuation of the stored goods between the end of last year and the first half of this year. Since British Petroleum (BP) left Jordan in 2013, hopes for gas discovery in Jordan have dwindled (Hjazin, 2014). According to the late chairman of the Jordanian parliament's energy committee, BP backed out not just on technical, but also political grounds (Betroleum, 2019). It's easy to envision a situation in which policymakers want to sabotage public confidence in the potential of national oil and gas deposits (including fracking) in order to make a fast bargain with Noble Energy for Israeli gas, which is located just across the Mediterranean Sea. The pipeline's construction began in 2001, with the first segment connecting Arish in the Sinai Peninsula to Aqaba, Jordan. Following that, additional parts were constructed to link Aqaba to the Syrian border, and from there to Lebanon and the Turkish border (Scheer, 2020). The prospect of producing 700 million cubic feet of natural gas from the Risha field per day (mcf/d) (nearly twice Jordan's current daily consumption) has steadily faded. Jordan was projected to receive up to 300 mcf/d from this area as early as 2015. However, after the Egyptian revolt in 2011, Jordan's Liquefied Natural Gas (LNG) imports from Egypt have steadily decreased. As a result, LNG electricity generation fell from 80% in 2010 to 20% in 2012. The primary factors were once again bad politics, mismanagement, and uncertainty. It's unclear how many or how much of these considerations influenced BP's decision to abandon discovery in Jordan (Abu-Dayyeh, 2015).

1.1. Indicators Impact

1.1.1. Environment indicator

To contribute to climate change mitigation and live up to the global sense of the need to move from a carbon-based to a sustainable economy, we must monitor carbon emissions and participate in the Global Carbon Stocks Program, where Covid-19 has directly led to reduced greenhouse gas emissions and domestic air pollutant emissions, due to reduced energy demand. Due to nationwide curfews, Jordan's factory activity has been reduced, resulting in significant reductions in greenhouse gas emissions and energy demand (Alasali et al., 2021). The GG-NAP outlines green growth structures and actions for Jordan's agriculture, energy, tourism, transportation, waste, and water sectors, with the goal of assisting Jordan's green growth vision and improving future capacity to rebound and contain shocks from disasters (Zaidan, 2020).

1.1.2. Economic indicator

Jordan fell 16 places to 82 in the World Economic Forum's Energy Transition Index, from 66 and achieved 49.5%, compared to 53% in the 2019 index. Jordan also achieved 46% in terms of energy system performance, compared to 56% last year, and 53% in terms of readiness, compared to 50% in the index last year (Jordan, 2020). Jordan's economy slowed to 1.3% in the first quarter of 2020, representing just a portion of the COVID-19 pandemic's effects. Meanwhile, labor market forecasts for the second quarter of 2020 show major disruptions from the COVID-19 crises. The already high unemployment rate increased to 24.7% in Q4-2020, up from 19.3% in Q1-2020, despite a 0.4% drop in the labor

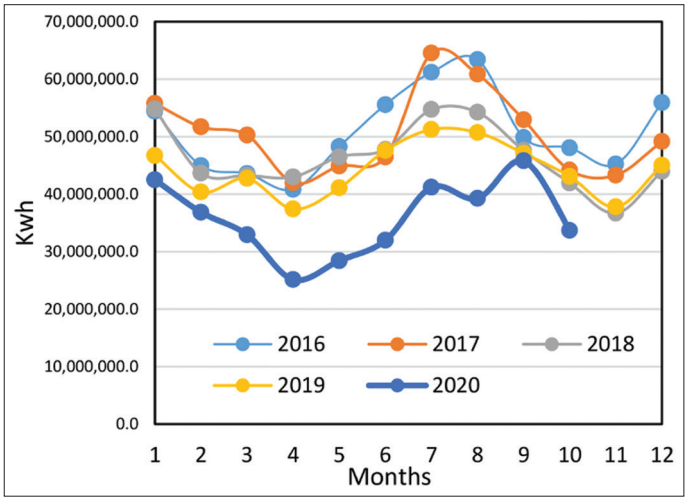
force participation rate (Munawwar, 2014). Looking ahead, the pandemic would have a similar negative impact on Jordan's economy and opportunities as it has on its trading partners and the MENA region. Lower energy prices and a steady drive for change to improve production and boost competitiveness will help Jordan's economy and opportunities recover in the medium term. Recognition on a global and international level (Memr, 2018).

1.1.3. Energy indicator

This section introduces load demand profiles to explore the five-year periods of monthly demand. The trends in demand in Downtown, for 5 years for monthly charges, are seen in Figure 1. The average demand was 40% and 37% decreased in 2020 compared with 2019 and 2017. During the initial measure span (March to May 2020), Jordan's peak demand and demand activity directly impacted electricity use.

The Renewable Energy and Energy Efficiency Law was passed, and a fund for energy efficiency was set up. A Feed-in-Tariff schedule for renewable energy resources has also been established (Abu-Rumman, 2020). With an increase in electricity generation capacity from 1.13 GW to 1.8 GW, the government has set a goal of generating 10% of its energy needs from renewable sources by 2020 (Shahateet et al., 2021). In addition, the use of renewable energy sources such as solar thermal, geothermal, bio-energy, and wind energy will be improved. This will eventually boost the national energy industry. The Jordanian Energy Sector Updated Strategy (2007–2020) built on the previous National Strategy from 2004, which was hampered by a number of issues that prevented the implementation of a number of projects. The words "resilience" and "sustainability" are not discussed in either the 2007-2020 Strategy or the previous one (Birol, 2020). The plan identifies the country's major current energy-related challenges; resilience and sustainability. Although these issues are not specifically addressed in terms of resilience or sustainability in the plan, the government has long recognized the issue of energy security. Furthermore, Jordan's energy sector's resilience is critical because it is vulnerable to external shocks, such as price fluctuations, and has national economic implications. Even humanitarian organizations working in Jordan's refugee camps have had to deal with unsustainable energy supply costs. Faced with such a challenge, it is imperative to pursue alternatives through a strategic plan whose goals revolved around: a stable, clean, efficient, and inexpensive energy to be supplied, wherever possible, through self-reliance and diversifying sources; as a result, the emphasis shifted to improving the green energy sector and energy conservation.

Figure 1: Monthly electricity demand (KWh) in Jordan's city center over the last five years, including during the current pandemic (12)



The wind and solar energy installed in Jordan's electric power system are considered significant capacities, which are ratios higher than what has been achieved by developed countries. The generating capacity of renewable energy projects is expected to increase by around (2400) MW by the end of 2021 (Hrayshat, 2007). Jordan has a chance to be listed among the leading countries in the field of green energy as a result of our collaborative efforts between the government and the private sector to complete those projects. Due to the Kingdom of Jordan's rising energy demand, future strategies for alternative and economic options have been devised. In the area of renewable energy, the comprehensive strategy for the energy sector included legislation aimed at increasing the contribution of new and renewable energy to 7% of the energy mix by 2015 and 10% by 2020. Resorting to renewable energy instead of conventional energy is the best solution to overcome all economic, political, and some environmental obstacles. In the literature, in the renewable energy sector, there is very little research on the impact of the Covid-19 outbreak. The industry is suffering as a result of issues such as supply chain delays, tax stock market issues, and the risk of losing out on government incentives that are set to expire this year (Etier et al., 2010). Use of renewable energy resources in Jordan, one of the energy situation in Jordan and some success stories in the field of renewable energy technologies have been published by (Alzoubi, 2010). The Hashemite University in Jordan examines global radiation, diffused radiation, and other meteorological data to include a systematic report on solar radiation (Association, 2018) and (Badran, 2001). They proposed new regulations to ensure sufficient solar accessibility in modern residential apartment construction in Amman (UNDP Tewodros Aragie Kebede, S. E. 2020). The degree of agreement between load variation patterns and renewable energy source power generation was reported by (Visp, 2019).

Based on the above, no study has been conducted to research the impact of the Corona pandemic on the energy sector in Jordan. When studying the effects of the Corona pandemic on the energy sector, and trying to explore the post-pandemic future, we are not dealing with a purely economic issue, but rather we are analyzing a central turning point in world history, in which we may witness important geopolitical shifts and shifts in the power centers of the global system. The two major technical obstacles stymieing RE growth are national energy overproduction and the unpredictable existence of RE. Although renewables only accounted for 0.05% of the country's energy generation in 2018, the government announced in January a revised target of 50% by 2030, which would be accomplished by the widespread implementation of new projects. This might enable member countries to access some of the cross-border electrical interconnection infrastructure that has been funded by the Arab Fund over the years, as well as interconnections established by GCC countries. The main problem of this study is to

study the effects of lockdown measures imposed across the country due to the COVID-19 pandemic, which have exacerbated the weak abilities of companies to operate in the area, and so the capacity of families to pay for life's basic needs. It also led to a decrease in energy sector investments, causing liquidity challenges to finance new energy projects. Combined with disruptions in supply chains, maintenance delays, and delays in establishing new projects, these factors together are likely to lead to further electricity shortages, so this study aims to understand the factors affecting the energy sector and support them with available recommendations. The main goal of this study is to determine the impact of the COVID-19 pandemic on Jordan's energy sector, along with this main purpose, the following objectives will be achieved: Draw attention to the alternatives that can be accessed to legalize energy consumption and improve its efficiency, and encourage everyone to follow it, Draw attention to natural resources and the exploitation of clean energy, as it has proven its effectiveness and success in light of the COVID-19 pandemic and reviewing in-depth research on the energy sector in Jordan.

2. RESEARCH METHODOLOGY

The initiative is summarized by the multiple benefits that can be gained from the advancement of solar technology, which can be generally divided into three categories: energy, economy, and environment. Mutual interference is also possible since the three Es are intertwined. Any or all of these acts may be applicable depending on the country; the priority order may differ. This study's approach will be as follows:

- Review previous studies on the energy sector in Jordan and the effect of COVID-19 on Energy in other countries.
- Review of previous Jordan surveys which discuss the effects of COVID-19
- Analyze the spread of COVID-19 in Jordan and recognize the situation of Energy and understand the relationship between them.
- To examine the demand for electricity on an annual and regular basis before and after the COVID-19 pandemic, and to completely isolate the effect of COVID-19 on Jordan's energy demand.
- Set up some recommendation and documentations.

2.1. Summary of Effect of COVID-19 on Businesses Survey

This survey was conducted in Jordan by United Nations Development Program (UNDP) and International Labor Organization (ILO). The assessment is based on data from two separate market evaluations. The study is one of a sequence of accelerated studies conducted by as part of a larger effort to evaluate the impact of the COVID-19 pandemic on Arab labor markets, the ILO has released a report (Tewodros Aragie Kebede, 2020). ILO and UNDP performed a sample survey in Jordan of 1,190 people in April 2020, to companies (including home-based companies, micro and small businesses, and larger corporations). This survey provides results on the effect of Covid-19 on businesses that use collection data. Companies included manufacturing companies (38%), distribution and distribution companies (11%), mining and quarry (10%), accommodation providers and food services (10%); the remaining 31% is divided amongst different industries. The COVID-19 pandemic has now shown Jordan's weaknesses in this sector, as well as the weaknesses in businesses and services such as health systems across the world, and it is a disaster in the making as the pandemic spreads quickly to Jordan due to its weak health system, which is compounded by low access to modern and reliable electricity. Given Jordan's growing demand for energy, strife is inevitable. In the world of green energies, to be precise (Fund, 2020).

Short-sighted politics, reliance and science and technology impediments all lead to uncertainty in the energy planning process. However, if Jordan moves towards energy independence, the effect of these considerations on the energy policy will be much less drastic. Jordan has a lot of promise for renewable energy sources like wind and solar. Savings of up to 20% could be achieved in certain industries with only limited capital expenditures in energy production and rationalization. As a result, Jordan's dependence on imported nuclear fuel will continue to pose a geopolitical problem as well as a persistent threat to the country's energy stability. Another significant factor to the energy mess was the fabrication of the electricity load in order to explain the inclusion of nuclear power in the grid. This was achieved at the exorbitant cost of "load mismanagement" and correspondingly high capital investment, with negative effects for programs in other industries. Finally, if substantial future change can be anticipated with realistic optimism. Exaggerated demand load projections in the Plan add to the overall energy policy perspective.

2.2. Selections from the Survey

The ILO business survey sample was taken from the database of ILO, which included "all companies that have engaged in ILO's program and project activities." The ILO's database is largely the product of its career centers, which are designed to link job seekers and employers. The sample consisted of all available companies in the ILO database, totaling 1,355 businesses. The UNDP's corporate study used three databases to sample 2,584 out of 38,471 businesses: I The Municipal Property Tax database was primarily used in the Kingdom to sample a variety of registered companies and home-based businesses (except for businesses registered within the Greater Amman Municipality and Aqaba Special Economic Zone). The Ministry of Digital Economy and Entrepreneurship (MODEE) Tech-start-up database was used to sample registered businesses in the services, manufacturing, and agriculture sectors from within the Greater Amman Municipality (329 enterprises); and (ii) the IRADA Program17 database was used to sample registered businesses in the services, manufacturing, and agriculture sectors from within the Greater Amman Municipality (329 enterprises) (2,113 enterprises) (142 enterprises). UNDP collected responses from businesses who received direct assistance from various UNDP projects and initiatives in a separate data collection campaign. A total of 270 UNDP beneficiary enterprises from seven governorates were included in the survey (Mafraq, Zarqa, Amman, Irbid, Ajloun, Jerash, Karak, Madaba, and Balqa) Businesses that were both formal and informal in terms of their registration status included micro, small, and home-based businesses. The results of this survey were not combined with those of the other datasets. instead, it was examined independently.

2.3. Questionnaire

The ILO and the UNDP collaborated on a systematic questionnaire. The form and specificity of questions have an effect on the accuracy of survey results as well as the likelihood of respondents returning for more rounds. As a result, the survey questionnaire was kept short, with no long or multiple-choice questions. The questionnaire was divided into smaller parts, each of which addressed different topics and addressed different types of respondents, resulting in a versatile questionnaire design (e.g. from enterprises of various sizes). While the ILO used the full version of the questionnaire, the UNDP only used a simplified version to collect data. Both questionnaires were translated into Arabic and made available to respondents in that language, as the main field of the Questionnaire was in the manufacturing and agriculture sectors (UNDP, 2020). Computer-assisted telephone interviewing was used to perform the ILO survey (CATI). KoBoToolbox was used to create the data collection software, and smart cell phones were used to execute it. To carry out the data collection activities, The International Labor Organization (ILO) recruited 20 interviewers and three supervisors. The information was gathered between April 14 and April 29, 2020. The data was stored on a dedicated, reliable server, as is customary in humanitarian response. There were 714 completed interviews with business leaders as a result of the data collection. representing a response rate of 53%. The sample of businesses comprised producers (38%), wholesale and retail (11%), mining and quarrying companies (10%) as well as hosting and food services (10%), while the remaining 31% were divided into numerous segments of companies.

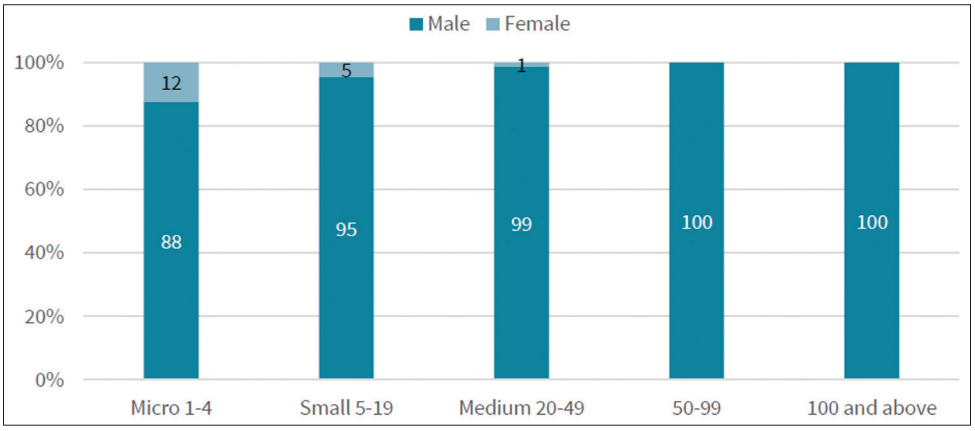
2.4. The (UNDP) Business Study

The UNDP performed two data collection activities, the first of which sought to utilize Jordanian government databases, and the second of which focused on UNDP-supported businesses. The data collection for the first study of companies was outsourced to Crystel Call, a survey firm. The data was collected by a team of 15 interviewers from April 19 to April 26. Data was collected using the "Genesys" program and then exported to Excel/SPSS for review. The data gathering exercises yielded an 18% response rate, with 476 completed interviews with enterprise members. Since the records are out of date in terms of basic details needed for the analysis, such as active phone numbers, the high rate of non-response can be due to this. Seventy-two percent of the 476 interviews completed came from the Municipal Property Tax database, while 25% came from the IRADA service database, and 3% came from the MODEE database. Five UNDP employees collected data for the second batch of UNDP beneficiaries from April 23 to April 28, 2020. A response rate of 55% translates to a sample size of 155 businesses. The resulting dataset is examined independently, with the results presented in Section 10. Not all companies in Jordan have the data utilized in this research. In addition, during the survey operations a series of problems were confronted, imposing some restrictions that have to be taken into account while interpreting the findings. Their responses are minimal and informal companies are limited to the sample [28]. Despite these restrictions, the reports provide insights into the effects of the COVID-19 epidemic on companies. To dynamically capture the implications of COVID-19, the surveys are built as a panel structure to repeatedly interview samples of companies. In later rounds of data gathering, certain constraints will be resolved.

2.5. Characteristics of the Businesses

The profile of the businesses in the dataset is presented in this section. For statistics that use a smaller survey, explicit remarks are provided—as previously discussed, the UNDP's questionnaire was marginally shorter. A total of 1,082 people responded with details on where their businesses are located. Amman has the highest concentration (74%) followed by Irbid (13%), and Jerash (3%), (3%), (6%). Jordanians own the vast majority of the businesses (87%) and Syrians own 3%. Of the others, some businesses are owned by people of various nationalities, but mostly Jordanians (2%); others are split evenly between Jordanians and Syrians own 1% of the companies, while the rest are owned by citizens of different nationalities. Almost every company surveyed (97%) has a license from the relevant authorities. As a consequence, this evaluation is most useful for organized companies. The majority of the companies (41%), with less than four workers, were micro businesses, while 28% were small businesses with five to 19 employees, 13% had 20 to 49 employees, 8% had 50 to 99 employees, and 10% had more than 100 employees. Female entrepreneurs owned just 8% of the companies. Female ownership was more prevalent in microbusinesses (12%) and declined as the size of the company increased (Figure 2). The companies are classified into 19 associated sectors using the International Standard of Industrial Classification (ISIC) scheme. Manufacturing, however, accounts for the majority of them (38%) followed by industrial and retail trade (11%), mining and quarrying

Figure 2: Ownership by business size (employee number) and sex (per cent) (UNDP, 2020)



(10%), and housing and food services (10%). (10%). (10%) The remaining 31% comes from a number of sectors with small sample sizes that are categorized as "other industries." The bulk of businesses have been in service for more than five years: 27% have been in operation for five to ten years, and 45% have been in operation for more than 10 years. Eighty percent of companies with more than 100 employees have been in operation for more than ten years. About 4% of companies were less than a year old, and only 1% were between 1 and 2 years old (12 %). Table 1 shows the age of the businesses as well as their size.

Before the Coronavirus pandemic, about 27% of businesses were successful, with 46% breaking even and 25% losing revenue. The degree to which businesses have ongoing contractual obligations has a bearing on their willingness to take on new ones. Bank loans are used by around a third of the 1,185 businesses (37%), and larger businesses (those with 50 or more employees) seem to depend on them more than smaller businesses. Micro companies are more likely than other businesses to provide microfinancing loans. Three out of ten businesses have postponed payments. Few of the businesses polled have childcare, flexible work schedules, or parental leave, both of which are essential for working from home and for parents, especially mothers. Seventy-four percent of the 1,187 businesses said they had no other arrangements or non-pay incentives in place. The most common providers with such plans are businesses with more than 100 employees: 26% have maternity leave, 17% provide childcare facilities, and 10% provide flexible working arrangements.

3. DISCUSSION AND ANALYSIS

In the event that the current situation at the time of the survey had persisted, more than half of the surveyed businesses (56%) planned to be in operation for fewer than three months. About a fifth of the businesses were unsure whether they would continue to operate, indicating the high degree of instability in the industry. Just 13% of businesses plan to continue operating for longer than three months. Smaller businesses, like their willingness to continue paying salaries, were more likely to shut down after a month than medium and larger businesses. Those businesses that were in a bad financial condition due to the lockdown were much more likely to shut down than those that were in a comparatively strong financial situation. Reduced revenues (63%) and poor liquidity and cash flow issues (46%) were identified as the key barriers to the surveyed businesses continuing operations in the months ahead. Many manufacturing firms face transportation and access to work challenges, especially in the garment and textile industries, where production costs have risen significantly due to the provision of shuttle buses, as public transportation is unavailable during the lockout and reduced in capability due to social distancing steps.

In terms of the Covid-19 crises' effect on overall market morale, more than half of the surveyed businesses (52%) are optimistic that they can survive the storm and return to profitability after the crisis is over. While 21% are not confident in their economic resilience and robustness. All of the surveyed businesses had a high level of doubt about their robustness, but micro businesses had an especially high level of concern (29%). As compared to businesses that were prosperous prior to the recession (63%) and businesses that were losing money prior to the crisis (33%) were more optimistic that they would survive the crisis (41%). As a result of the COVID-19 crisis, almost 40% of surveyed businesses avoided paying social security contributions, taking advantage of the waiver introduced in Defense Order 1. As compared to bigger businesses, a higher percentage of small businesses have avoided paying their bills. Just 34% of businesses with more than 100 workers have avoided paying their bills, compared to 45% of micro businesses. Overall, 63% of surveyed companies have taken no steps to ensure market continuity; however, this number is marginally higher for home-based businesses, at 74%. Businesses are contemplating the launch of innovative goods (18%) or new business structures (14%), as well as incorporating innovation and technological systems (11%), and e-commerce sites (10%). Lack of sales/demand (36%) was cited as a major obstacle for businesses in the coming months, followed by liquidity restrictions (23%), and transportation issues (23%). (22%). More than a third (37%) of respondent micro businesses said they will be unable to operate for more than one month under current conditions (lockdown), demonstrating the fragility of businesses.

3.1. Result of Jordan's COVID-19 Response Initiatives

All of the surveyed businesses reported cash flow issues, decreased demand and supply, and value chain disruption.

A. Just 7% of surveyed businesses said they were running normally at the time of the study, while 39% said they were operating but with less employees (7%), fewer working hours (16%), or both (16%). About half of the businesses surveyed (51%) said they had temporarily closed.
B. 42% of businesses said they'll be able to afford all employees' wages for less than a month under current terms, while another 42% said they'll be able to do so for less than three months. Micro companies (55%) and small businesses (44%), on the other hand, suggested that they lacked the financial resources

Table 1: Number of years the company has been in service by scale (%)

Total	<1 year	1–2 years	3–4 years	5–10 years	More than 10 years	Total	
						Total	Sample size
	4	12	12	27	45	100	1,185
Size of enterprise by number of employees							
Micro, 1–4	8	19	16	27	30	100	489
Small, 5–19	2	11	15	27	45	100	330
Medium, 20–49	1	5	8	28	58	100	155
50–99	1	1	6	29	63	100	97
100 and above	-	-	3	17	80	100	114

n=All enterprises

to continue paying wages for another month, while medium businesses (33%) and larger businesses (23%) were more likely to be able to do so.

C. Around a quarter of businesses (26%) said they could stay open for less than a month under current conditions, 30% said they could stay open for 1 to 3 months, 5% said they could stay open for 4 to 6 months, and only 13% said they could stay open for more than 6 months. A significant number of them (27%) had no idea how long their companies would last if the situation at the time of the survey remained unchanged.

D. About half of the respondents (52%) are optimistic that they can weather the recession and return to profitability, although 20% are skeptical of their economic stability and robustness. However, when asked about their pre-crisis financial condition, 25% of businesses said they were losing money and 46% said they were breaking even, implying that many businesses were in financial trouble prior to the lockout measures. Home-based and micro-business owners are more concerned.

E. The vast majority of workers who were unable to go to work due to the lockdown continued to be paid in full or in part by their employers. Employees who were unable to come to work were also paid in full 71% of the time, with 20% collecting partial wages. As opposed to workers in small businesses, employees in big businesses were more likely to receive full pay when they were unable to come to work.

F. Companies' ability to navigate the economic downturn would be determined by a variety of factors, including how flexible they are in maintaining business continuity and adjusting their business processes; moreover, only 25% of respondents said they had a business continuity strategy in place.

G. More than 72% of surveyed businesses said they had distributed protective clothing to workers, such as hand sanitizer, goggles, and gloves, or had increased cleaning and sanitizing activities through workplaces, in order to minimize the spread of COVID-19 in the workplace (55%). However, 23% of microbusinesses said they had taken no action at the time the survey was conducted.

H. The majority of businesses (67%) said they were unaware of any assistance packages or interventions available to help them alleviate the crises' effects at the time the survey was conducted (late April). 12% of businesses said the government is subsidizing salaries, with 16% of small businesses and 21% of businesses with 100 or more employees saying the government is subsidizing pay. Soft loans were used by 8% of respondents, and credit was used by 5% of respondents.

I. Direct financial support is seen by 53% of companies as the most important support required to deal with the crisis at this time, with 60% of micro businesses and 43% of firms with more than 100 employees showing a need for direct financial support.

J. 42% of all businesses polled said wage subsidies were essential to deal with the crisis at this stage, with 68% of businesses with more than 100 employees agreeing. Access to credit was stated by 20% of respondents.

The COVID-19 pandemic and its reaction policies have had a major effect on Jordanian businesses. Cash flow issues, decreased demand and availability, and value chain instability are reported by nearly all of the businesses surveyed for this study. Furthermore, the vast majority of them anticipate a significant drop in sales.

3.2. Status of Operations

Just 7% of the 1,190 businesses surveyed were working as they were before the pandemic at the time of the study. 39% of businesses were running with fewer employees and/or fewer hours, and 51% of businesses had temporarily shut down. When in comparison to medium and larger companies (<31%), a higher percentage of micro (62%) and small businesses (58%) had temporarily shut down their operations (Figure 3). The reduced demand and revenues were a concern for nearly three-quarters (73%) of surveyed businesses, while income loss was recorded by 59% and liquidity issues by 52%. Since lower demand and sales result in lower revenue, Lower demand and revenues have been confirmed by all companies that have experienced a revenue loss (Table 2). Economic effects are fairly equally spread across

Figure 3: Operational state of businesses based on their size (percent) (UNDP, 2020)

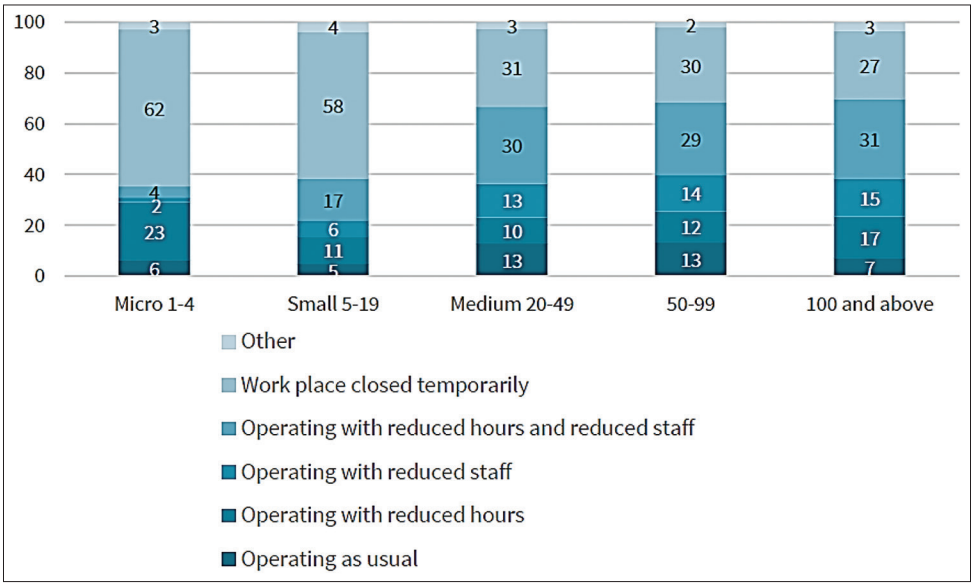


Table 2: COVID-19's economic effects by scale

	Loss of revenue	Reduce demand/ sales	Increased costs of production	Access to cash/ liquidity problems	Problems importing materrals	Increased revenue	Increased debt	Bankruptcy	No economic Impact	Total	
										Total	Sample size
Total	59	73	24	52	21	1	14	3	5	100	696
Size of enterprise by number of employees											
Micro 1–4	68	73	15	55	18	1	22	4	4	100	158
Small 5–19	55	71	19	46	14	1	17	2	4	100	223
Medium 20–49	58	75	32	56	25	2	7	2	6	100	130
50–99	56	76	29	54	26	1	9	1	7	100	87
100 and above	59	74	34	53	30	-	6	2	4	100	98

n=The total number of Enterprises. It's possible that many responses and percent add up to more than 100

businesses of various sizes. However, a considerably higher proportion of small and micro businesses seem to be increasing their loans in order to deal with the crisis. If the recession persists, or in the wake of the crisis, this could result in a large number of bankruptcies among these businesses.

3.3. The Impact of the COVID-19 Pandemic on Travel and Import Restrictions for Tourism and Manufacturing

Tourism, which includes transport and hospitality services, is projected to be one of the hardest hit markets. The imposition of travel bans, as well as the closing of airports and border crossings, has resulted in a large number of cancellations and a complete halt to the industry. According to the Chairman of the Jordan Inbound Tour Operators Association (JITOA), 18 up to 40,000 jobs in the hospitality industry, associated coach transportation, and among tour operators will be lost. International travel constraints and a global economic slowdown are projected to reduce demand for travel to Jordan from Europe, the United States, and Asia until the first quarter of 2021. "One of the worst hit industries is tourism, with a GDP contribution of JOD 4 billion (USD5.6 billion) or 13% of GDP. The government's tourism response policies are modest, encouraging only domestic tourism packages, which are insufficient to compensate for the industry's economic effects. Given the closing of tourism offices, restaurants, transportation, and travel agencies, and the longer-term outlook for growth – not until the first quarter of 2021.

3.4. Energy and Electricity Situation

The Company renewed its energy sharing deal with the Egyptian Power Transmission Company for 2020 in order to satisfy the Kingdom's electricity requirements when they become available (NEPCO, 2019). In 2019, the electric power system's peak load is (3380) MW, up from (3205) MW in 2018. Based on the outcome of the Electricity Demand Forecast Study for the period, this is projected to rise by 3.0% in 2019 and (2.9%) annually (2020-2040). To meet Jordan's, the demand for energy, the Company, through its National Control Center, takes all required steps to ensure that all customers receive uninterrupted electricity at negligible rates, in accordance with international standards. The Energy and Minerals Regulatory Commission, generation and distribution firms, these activities include the Ministry of Energy and Mineral Resources, as well as the Energy and Minerals Regulatory Commission. In comparison, the Jordanian electric power system's generation capacity at the end of 2019 was around (5728) MW, including the generation capacity of renewable energy projects on the distribution grid, which was around (460) MW, up from (360) MW the previous year, with a growth ratio of 1 (27.8%).

3.5. The Impact of the COVID-19 Pandemic on National Electric Power Company

The COVID-19 pandemic had a major effect on Jordan's power market, causing sharp drop in electricity consumption due to the economic slowdown, estimated at around 10%, which was not reflected by NEPCO's long-term payment obligations under long-term contracts with electricity and gas suppliers. Additionally, there was a drop in the distribution companies' recovery of energy purchases, resulting in a two-month halt in payments from the distribution companies to NEPCO (from mid-March to mid-May 2020) and serious delays afterwards, with severe consequences for NEPCO's operational cash flows. As a result, NEPCO was forced to start deferring payments due to severe working capital restrictions. NEPCO has only been able to pay 75% of the sums owed to Jordan's green and traditional private independent power producers (IPPs), which have almost half of the country's generating energy, since April. Jordan's power supply was put in jeopardy as a result of this.

That may also jeopardize the hard-won integrity of the contractual structure the supports that industry. As a result, investor interest in Jordan as a foreign direct investment destination and, given its position as a regional model, the renewable energy sector in SEMED, could be jeopardized. To resolve this concern, the Bank collaborated closely with NEPCO, Jordanian authorities, investors, and other IFIs. NEPCO has signed an agreement with all renewable energy IPPs to return to absolute payment discipline and refund its arrears within the first half of 2021 as a result of these efforts. NEPCO is working on a related deal with traditional power suppliers, which will be finalized before the proposed loan is signed. This is an important step toward regaining investor interest,

which is vital considering the magnitude of investment needed for Jordan's and the region's ongoing green transformation [29].

3.6. Other Challenges Facing the Energy Sector's Growth

A. Proposals for energy efficiency are taking too long to execute.
B. There is a general lack of understanding of the advantages of energy efficiency.
C. Database is inaccessible, and details is unclear.
D. Inadequate regulation of Jordanian building codes implementation.
E. The Energy Efficiency Applications Law requires additional posts.
F. insufficient support for low-income households' Energy Efficiency projects.
G. Poor access to Energy Efficiency education, empowerment, and training.

Many Jordanian laws, including Article (10) of Bylaw No. (73) of 2012 on Regulating Procedures and Means of Conserving Energy and Improving Its Efficiency, which went into effect on April 1, 2013, should be revisited. 15 Solar Water Heaters (SWHs) are not allowed to be used in standalone buildings or apartments smaller than 250 m2, exempting more than two-thirds of dwellings from the law.

4. CONCLUSION

The COVID-19 pandemic is placing economic pressure on all nations, causing economic disruption and killing hundreds of thousands of people worldwide. As the COVID-19 pandemic has now shown Jordan's vulnerabilities in this sector, as well as weaknesses in businesses and services such as health systems around the world, the expectations showed that this pandemic will bring about drastic shifts that will last for a longer period. Regarding fossil fuels and the apparent growth in the use of renewable and sustainable sources. Short-sighted policies, dependence, and scientific and technological constraints lead to uncertainty in the energy planning process. However, if Jordan moves towards energy independence, the impact of these considerations on energy policy will be much less severe. Instead of importing gas as well as heavy crude oil, this can be achieved by making use of shale, gas and existing clean energy sources. Jordan has a lot of hope in terms of renewable energy sources such as wind and solar energy. Savings of up to 20% can be achieved in certain industries with only limited capital expenditures in energy production and rationalization. In order to achieve the target priorities and targets, the following measures have to be considered:

- These results from this study show that Jordan should start cutting out conventional energy and replacing it with renewable energy. This promotes the improvement of the economy, self-reliance, and environmental conservation, and benefiting from new lessons from COVID-19. The status of the energy market globally, where the overall strategy for Jordan's energy sector should be reconsidered, which did not mention the COVID-19 pandemic, unlike other countries. Such countries began to change their policies according to the new data and encourage the use of alternative energy to effectively support and manage a higher share of renewable energy sources.
- Removing the price hurdle in tandem with the growth of the clean technologies sector in Jordan and compiling and reviewing data on renewable energy sources such as wind and solar. Additionally, conducting technical commercial research on the use of solar panels in multi-family residences and small commercial establishments.
- Intensifying the government's serious work in the field of solar energy by supporting and financing projects related to solar energy. The government should also review the regulations for licensing the installation of solar energy systems to facilitate access to licenses. This comes with in investment in energy-saving policies, including the advancement of renewable, viable energy technologies, must be channeled and prioritized.
- In light of the above findings and claims, all interested Jordanian stakeholders should be informed that COVID-19 has dealt a significant blow to fuel prices in the first quarter of 2020, oil prices dropped by 50%. Oil price risks are substantial, arising from both supply and demand shocks. Oil prices will be kept down for a long time due to a combination of increased fuel production and poor global demand.
- Take energy efficiency (EE) governance seriously, and encompasses both the public and private sectors, as well as the local government. And amend, refresh, and rewrite EE guidelines to make them more adaptable to the ever-changing demands of the Jordanian market.
- Raising sectoral awareness of laws, regulations, and EE equipment exemptions, as well as broadening their application to the general public. Also looking at the possibility of introducing new strategies and technology to help the nation properly meet its electricity demand (e.g. CSP, EVs).
- Launch public awareness campaigns in Jordan's mass media targeted at all sectors of society, emphasizing the value, benefits, and effect of EE on individuals and the region. This procedure will assist with the replacement of outdated and inefficient electrical equipment and lamps. In addition to coordinate student programs in colleges and schools related to energy efficiency, Restructuring the education system in schools to provide an informative clean energy system policy for changing customer behavior, promoting sustainable and integrating EE into curriculum solutions.
- Build a more efficient mass transit system that operates across the Kingdom and complete new public transportation programs, such as the Bus Rapid Transit, to provide an interconnected and efficient public transportation system that connects all of the Kingdom's governorates (BRT). New projects such as the Light Rail Transit (LRT) and underground metro networks (subways) should be implemented to reduce the number of private cars and increase demand for public transportation.
- The rehabilitation and activation of the railway as an official mode of transportation serving all governorates should be a top priority for the country. Also the policymakers should make public transit a top priority. Negotiating with regulators would be better if the government had more leverage of public

transit, since working with a handful of airlines rather than thousands, as it is today, would be easier. As a result, large-scale operators will be able to benefit from economies of scale in their activities. This would allow them to reduce operating expenses per passenger or per mile traveled while maintaining or upgrading services that small operators cannot manage.

- Increase the number of electric vehicle charging stations to address issues about EVs breaking down due to insufficient battery capacity. It is also essential to develop energy storage technology. EV and electric vehicle government benefits, such as tax and customs exemptions, are not readily available throughout the world.
- Introduce the idea of carpooling, which saves people money on petrol, tolls, and time. Carpooling reduces air pollution, greenhouse gas emissions, highway traffic congestion, and the need for parking spaces, rendering it a more climate friendly and cost-effective means of transportation.
- Invest in more scientific analysis and creative concepts in this field, focusing on a systematic approach to gathering, reporting, and tracking data as non-biased and emotion-free theoretical observations.

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