The Profile of the Companies Most Affected by the COVID-19 Crisis in Morocco

Wafa El Gouz[1], Farid Echcharfi[2] and Mounir Zouiten[3]

[1]Ph.D. student at FSJES –Souissi- of Mohamed V University in Rabat, Morocco
[2]Assistant Professor at FSJES, Moulay Ismail University in Meknes, Morocco
[3]Professor of Higher Education at FSJES – Souissi- of Mohamed V University in Rabat, Morocco

Abstract: In this article, our target is to handle macroeconomic data of quarterly growth in the branches of activity with microeconomic data from the World Bank Business Survey to deduce the profile of the businesses affected by the outbreak of the COVID-19 crisis in Morocco. Our findings show that the companies that suffered the most are those which recruit more employers, and those, which generate less turnover.

We have found in particular that companies recruiting larger workforce are the most affected as they can cause more unemployment to happen. In addition to this, we found out that companies with small sales rates are more affected than those with big numbers.

Hotels and restaurants and all shops were closed until further notice and consequently contracted by 5.6% in the first quarter of 2020 to reach 88.9% in the second quarter of 2020. Also, Electrical industries recorded a massive fall in their sales estimated at 15 % and 55.5% during the first period and the second period while "textile and leather" industry increased by 3.4% in the first period before falling 45.5% in the second quarter. Not only this, but also sports, cultural and arts events have been called off. People have been ordered to remain indoor, and restrictions on public and private transport and movement between cities are also shut, all these together have contributed to a sharp shrinking of the economic turnover of businesses. However, there were immense developments amongst companies active in the medical sector as huge demands on sanitary goods and medications were recorded all over the globe.

240

1. INTRODUCTION

Since the outbreak of the covid-19 pandemic crisis in late 2019, and in parallel with efforts in the health field to tackle this scourge at the international level, economists and business professionals have tried to assess its various impacts either on households, production units as well as outlining the necessary measures for resilience.

The approaches followed can be summarized mainly into two types. First, prospective models of the computable general equilibrium model type consist in modeling the behavior of businesses, and manufacturers. Based on these assumptions, they can draw more scenarios of several chocks of different kinds. This perspective has the merit of requiring very little data, which explains its adoption at the start of the crisis to assess the socio-

economic impact of the pandemic. Second, the usual econometric methods consist of collecting data from other countries during different periods to estimate the links between the key variables of the economy that make it possible to assess the impact through the elasticities estimated earlier. This type of approach has the merit of being based on evidence and rarely resorting to refutable hypotheses.

However, on the one hand, the first type of approach suffers from its hypothetical nature as it is based on unreal scenarios while the second necessitate a lot of data can that can pose problems of homogeneity if they come from different contexts with other limitations. On the other hand, a good deal of time has passed for the actual impact to be observed without resorting to either of the above approaches. Indeed, the quarterly results on growth by branch have already been published by the statistical services of many countries. In the case of Morocco, the High Commission for Planning (HCP) has already published the results of growth by branch for the first, second, and third quarters of 2020. At the same time, several surveys were conducted to assess the impact of the pandemic on several socioeconomic aspects in Morocco.

Among the several surveys realized by (HCP), none seeks to analyze the profiles of the companies most affected by the covid-19 pandemic in Morocco; to tackle this void without investigation which will require time and financial resources, we can combine the macroeconomic data constituted by quarterly growth with microeconomic data relating to the Moroccan productive fabric.

To identify the profiles of Moroccan companies most affected by the scourge, we will base our study on the microeconomic data of the survey conducted by the World Bank among Moroccan companies in 2019 (The World Bank Enterprises Survey - 2019) and the quarterly growth data to answer the following questions.

- What are the characteristics of Moroccan companies most affected by the covid-19 pandemic crisis?
- Are they SMEs (Entrepreneurship and Small and medium-sized enterprises) or rather large companies?
- What region do they belong to?
- In which sectors do they operate?
- What is the structure of their capital?
⇨ There are other subsidiary questions to these big questions.

This paper will present in a second section a literature review of previous studies that have dealt with the same problem. In a third section, we will present the methodology adopted to answer the questions listed above and then analyzing the results in a fourth section.

2. LITERATURE REVIEW

In the past, no less than five epidemics have raised concerns as critical as the covid-19 pandemic in terms of the spread and severity of the virus including the Spanish flu, SARS, swine flu, Ebola, and AIDS. These pandemics hit all economic sectors and brought about negative impacts on the quantity and quality of the workforce, they also restricted all social categories through the costs of medication and care.

This multidimensional nature of these pandemics and the interrelated nature of modern economies have necessitated the use of computable general equilibrium models (MEGCs) to assess their impact in the case of prospective studies or the usual econometric methods in studies thanks to the availability of instant cross-sectional data. This is true whether in pure academic work or through making recommendations in terms of economic policy.

Thus, Brainerd and Siegler (2002) applied metric methods on instantaneous economic cross-sectional data for the United States alone to avoid the obligations to control for the institutional heterogeneity of the Finomen pact American economy. Controlling for several factors. The authors concluded that this pandemic had a rather positive effect on the growth of the American economy during the 1920s. On the other hand, Bloom and Mahal (1997a) do not disregard the same pandemic on the growth of England, France, and India. The two authors (1997b) also used data from several countries and concluded a rather negative impact of AIDS on minor growth in Haacker (2002) who concluded Unix. The latter used a neoclassical growth model of one, then two before generalizing to several sectors because his objective was also to study the mobility of the factor. Finally, Fofana et al (2015) used a MEGC calibration on figures from Guinea to study the socio-economic impact of the Ebola pandemic.

Their analysis concluded among other results that food consumption is affected by the upheaval in international trade as well as trade between rural and urban areas.

Concerning the socio-economic effects of covid-19, several studies have been carried out using MEGCs models because of the absence of retrospective data to apply the methods of usual econometrics. The United Nations Development Program (UNDP) has carried out a series of studies on the subject covering a very large number of countries like South Africa (UNDP South Africa, 2020), using a MEGC calibrated on the SAM of the country of 2015. A study by this UN body in this country concludes with two scenarios. At the macroeconomic level, the optimistic scenario forecasts a decline in GDP of 5.1% compared to the reference scenario (BAU) in 2020, while the pessimistic scenario forecasts a decline of 7.9 %. In any case, the South African economy cannot recover before 2020.

In Tunisia, the branch of the same organization (UN) conducted a study on the same subject (UNDP Tunisia, 2020) also adopting two scenarios: a reference scenario which is that of the forecasts of the Ministry of Finance, and a scenario integrating the fall in supply from businesses, the fall in household demands due to containment measures, and a 40% drop in investment by the State which must redirect its resources to face the social impacts of the crisis.

Under the latter scenario, the overall investment would fall by 4.9% in 2020, household consumption and exports by 8%, and imports by 9.6%. The unemployment rate will increase from 21.6%, the monetary poverty rate will drop from 15.2% to 19.2%, and the extreme poverty rate from 2.8% to 3.9%.

Finally, Argentina, a country suffering from limited access to international funding, was the subject of a similar study (UNDP Latin America and the Caribbean, 2020). The optimistic scenario foresees a contraction of 10% of the GDP in 2020, inflation of 50% -60% while the pessimistic scenario foresees a contraction of 15% with an unemployment rate exceeding 20%.

Our study is post-crisis; that is to say, it aims at assessing the implications of the crisis on Moroccan companies after having been produced and not to make forecasts or simulations that relate to the future. Our study will not consider the complicated and hypothetical aspects of the behavior of businesses for the benefit of information already available which was not possible at the start of the crisis. On the other hand, we think that our study has the merit of reconciling the already known macroeconomic data constituted by the sectoral quarterly growth and the structural microeconomic data constituted by the WB (World Bank) survey on Moroccan companies in 2019. That is to say, it will show how the macroeconomic underperformance of Moroccan economy at the sectoral level was reflected at the microeconomic level ,that is to say the features or

profiles of the enterprises most constitutes the turnover and the profits of the companies impacted by the Covid-crises.

3. METHODOLOGY

The quarterly growth results disclosed by the HCP include the growth of nineteen economic branches over the first two quarters of 2020. Almost all of these branches showed negative growth compared to the same periods of 2019. Assuming that this decline in economic activity is due exclusively to the crisis of the covid-19 pandemic, we can reduce the impact of this crisis on the different branches of economic activity. On the other hand, from the data from the World Bank survey of Moroccan companies cited above, we can predict the representativeness of each company profile (PE) operating in each branch. By PE, we mean all companies that have a set of characteristics in common. For example, companies can be aggregated by size resulting in three PEs: small, medium, and large companies.

Each PE is represented by an aggregated representative business, the latter will see its workforce distributed over all the nineteen branches of economic activity. Therefore, the EP most represented in the branches affected by the crisis will be the most affected and vice versa.

This negative impact suffered by a PE in a branch will be a function of the pro-rata of its workforce operating in the mentioned branch and the total impact will be the estimated average of the declines recorded by the nineteen branches. The weighting considered maybe that of the figure achieved by the EP in the branch at hand or that of the workforce in the profile operating in each branch. We retain the last choice when the data on the former are difficult to access.

Thus, the income of each PE is derived from several branches of economic activity, the weight of which varies from one PE to another. In this way, the relative variation in the income of a PE will be a weighted average of the variation in income from the different branches, also assumed to follow the same trend as that of the branch.

This weighting of the branch in the total income of a PE can be done based on the profits attained by the PE, which would be more realistic or based on the workforce operating there. To simplify the calculations, we adopt the workforce of a PE operating in a branch as a proxy for the income of this PE to calculate the weight. Thus, the total income of a PE is the sum of the revenues that this PE receives from each branch.

Let's assume RPE_{ijt} is the income of PE I from branch j at a given time t, then the total income of a PE I at time t will be the sum of the income from each branch as follows:

$$RPE_{it} = \sum_j RPE_{ijt}$$

Concretely, the PE I at time 0 receives a total income RPE_{i0} from branches 1, 2 .... n, then end up with:

$$RPE_{i0} = RPE_{i10} + RPE_{i20} + \ldots.. + RPE_{in0} \quad (1)$$

Likewise, at time 1, the same PE I receive a total income RPE_{i1} from the same branches 1, 2, ... n, then, we have:

$$RPE_{i1} = RPE_{i11} + RPE_{i21} + \ldots.. + RPE_{in1} \quad (2)$$

By subtracting (1) from (2) and dividing both sides of the equation by RPE_{i0} and then divide and multiply each term j on the left side by RPE_{ij0}, we have:

$$\frac{RPE_{i1} - RPE_{i0}}{RPE_{i0}} = [\frac{(RPE_{i11} - RPE_{i10})}{RPE_{i10}}].RPE_{i10} / RPE_{i0} + [\frac{(RPE_{i21} - RPE_{i20})}{RPE_{i20}}].RPE_{i20} / RPE_{i0}$$
$$+ \ldots\ldots + [\frac{(RPE_{in1} - RPE_{in0})}{RPE_{in0}}].RPE_{in0} / RPE_{i0} \quad (3)$$
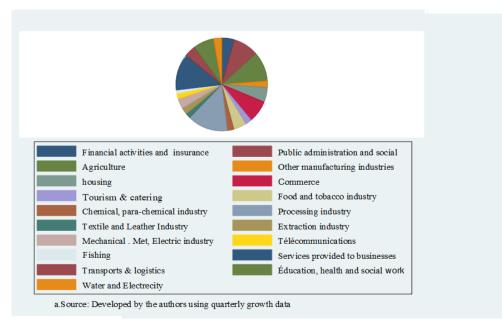
The left-hand term of this equation (3) represents the relative change in the total income of PE I. The terms in square brackets on the right side of the same equation represent the relative evolution of the income of PE I from branch j supposed to follow the same evolution of the mentioned branch. The items outside the brackets represent the weighting of the income from branch j in the total income of PE I at period 0. The period that we are studying in the first quarter of 2020 is compared to the same period 2019 as well as the second quarter of 2020 compared to the same period 2019.
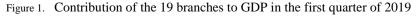
However, for the two periods which serve as a basis in this calculation, in the first and second quarters of 2019, we do not have a weighting of branch revenues in the total income of a PE nor of the workforce of the latter in each branch. Hence, we will have to assume by considering the fixity of this weighting since 2019, which we can accept as long as these coefficients are structural elements that remain relatively unchanged in the short term. Only shocks like that of the covid-19 crisis are likely to upset them. The weights retained will then be those of the World Bank's 2019 survey of Moroccan companies.

In short, the relative change in the total income of a PE is the calculated average of the relative changes in income from each branch or in the workforce of the PE operating in the different branches, also assumed to follow the same pattern as that of the PE.

A. Data Analysis

The decline in the activity of a branch harms both the GDP as a whole and the income of the PEs that operate within. The first effect is when the branch is more preponderant in the overall GDP while the second is more preponderant in the mentioned branch. The following graph shows the contribution of the 19 branches to GDP in the first quarter of 2019.

a.Source: Developed by the authors using quarterly growth data

Figure 1. Contribution of the 19 branches to GDP in the first quarter of 2019

As we mentioned earlier, to provide some answers to our problem, we worked on two types of data. On the one hand, the results of quarterly growth by branch, which we assumed to be perfectly correlated with the change in the part of the income of each PE from the corresponding branch. On the other hand, the data from the 2019 WB survey on Moroccan companies are used to provide the income structure of each PE, i.e., how much does the income represent within each branch of activity in the total income of each PE or the workforce of the PE operating in the branch.

The following table.1 shows the results of quarterly growth by branch over the first and second quarter year-on-year, i.e., relative to the same periods of 2019.

TABLE I. SECTORAL ADDED VALUES (CVS *) AT CURRENT PRICES BASE 2007 (IN MILLIONS OF DIRHAMS)

Branches of activity	First trimester			Second trimester		
	2019	*2020*	*Var. ***	*2019*	*2020*	*Var. ***
Agriculture	30622	29948	-2.2	33287	30654	-7.9
Fishing	3514	3015	-14.2	2006	1637	-18.4
Extraction industry	6940	6232	-10.2	5570	5860	5.2
Processing industry	42302	41954	-0.8	42940	33007	-23.1
Food and tobacco industry	13145	14163	7.7	14265	14279	0.1
Textile and Leather Industry	5197	5376	3.4	4985	2732	-45.2
Chemical and para-chemical industry	6913	6992	1.1	6515	6000	-7.9
The Mechanical, metallic, and electric industry	10517	8940	-15	10729	4774	-55.5
Other manufacturing industries	6529	6484	-0.7	6447	5222	-19
water and electricity	8397	8112	-3.4	8262	7261	-12.2
Housing	15335	15473	0.9	15302	12624	-17.5
Commerce	22824	23029	0.9	22151	16281	-26.5
Tourism & catering	7116	6718	-5.6	7432	825	-88.9
Transports & logistics	11615	11441	-1.5	12012	5483	-54.3
Telecommunications	5597	5646	0.9	5310	5197	-2.1
Financial activities and insurance	13187	13559	2.8	13261	13761	3.8
Services provided to businesses	37773	38491	1.9	37495	32546	-13.2
Public administration and social security	26567	28678	7.9	27113	28912	6.6
Education, health, and social work	21828	22819	4.5	21828	23232	6.4

b. Source: www.hcp.ma and calculations by the authors

* Seasonally adjusted

** Variations in percentages calculated by the authors

Except for a few rare branches that have maintained their upward trend, almost all of them have recorded a reduction in their economic activity which intensified in the second quarter of 2020 relative to the first quarter of the same year. This amplification is mainly explained by the fact that the containment measures were only taken from mid-March 2020, which represents just one-sixth of the period, unlike the second quarter which was marked entirely by measures. drastic containment. At the head of the regressive branches are those of "hotels and restaurants", "mechanical, metallurgical, and electrical industries" and the "textile and leather" industry.

''Hotels and restaurants'', ''mechanical, metallurgical industries'' contracted by 5.6% in the first quarter of 2020 relative to the same period of 2019 before recording a severe reduction of 88.9% in the second quarter of 2020 relative to the same quarter of 2019. Electrical industries recorded respectively underperformances of 15 % and 55.5% during the first period and the second period while "textile and leather" industry increased by 3.4% in the first period before falling 45.5% in the second quarter.

The activity of the "food and tobacco industry" slowed down without falling, recording a growth of 7.7% and 0.1 respectively in the first and second quarter of 2020 year-on-year. State branches or those in which the state is predominant continued to grow despite the crisis. Thus, "general public administration, and social security" and "education, health, and social action" posted respectively growth of 7.9% and 6.6% for the first and 4.5% and 6.4% for the second. "Financial and insurance activities" also continued to grow at a rate of 2.8% for the first quarter and 3.8% for the second quarter. "Posts and telecommunications" held up during the first quarter with growth of 0.9% before falling slightly by 2.1% in the second quarter.

This compression of the economic activity of the different branches will certainly harm the income of the different PEs. This impact will be the greatest for a PE if the most regressive branches are more preponderant in their income, hence the need to calculate the weightings of the income from the different branches in the total income of the different PEs. The latter is defined based on the 2019 WB Business Survey.

B. Impact by the size of business

Distinguishing the effect of the crisis on firms and companies by size is instructive in many ways. Indeed, the problems of small, medium and large enterprises differ, be it on the level of financing, marketing, or on the social level. Therefore, knowing the impact of the crisis on each type of business by size will allow public authorities to develop specific rescue batteries for each of them. Fig.2 below shows the cumulative curve of Moroccan companies by size.
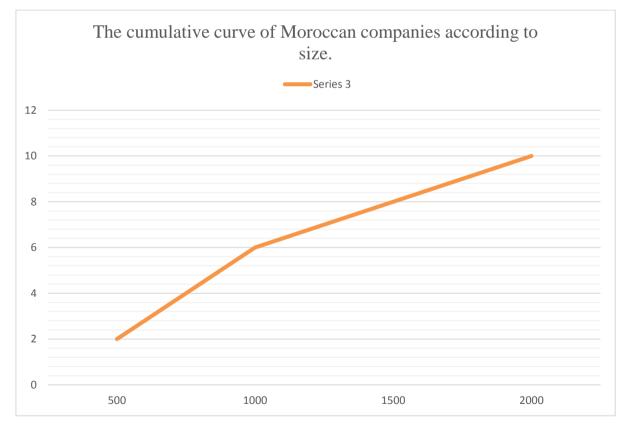
Figure 2. Contribution of the 19 branches to GDP in the first quarter of 2019

The fig.2 shows that the overwhelming majority (95%) of Moroccan companies employ a workforce of fewer than 500 people and more than 80% of them employ fewer than 100 people. Small firms are more prominent in the agri-food, retail, and unstructured services sectors while large firms operate mainly in the textile, industrial and structured services sectors. Medium-sized enterprises are spread over all sectors.
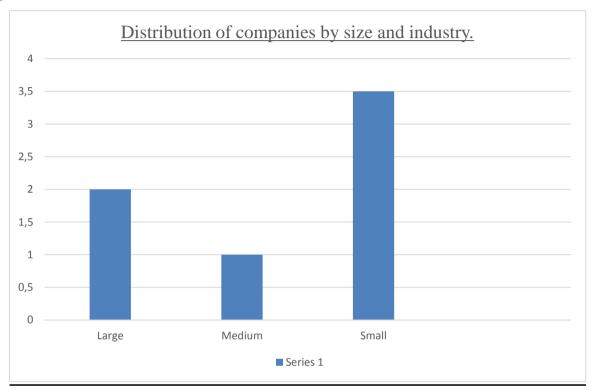
Fig.3 below shows these stats.

Figure 3. Distribution of companies by size and industry

Table 2, shows the distribution of companies in the 2019 WB survey on the 19 branches of activity, their weighting as well as the estimated impact of the crisis on the revenues of small, medium, and large companies (3). For the three PEs, revenue recorded during the first quarter before shrinking sharply in the second quarter of 2020 relative to the same periods of 2019.

This is explained by the fact that the containment measures only covered around fifteen of the day of the first quarter, which constitutes 16% of the period whereas they covered the whole of the second quarter. In general, according to our estimates, large companies were more affected by the crisis than small and medium-sized companies. Small businesses saw their activity register a slight growth of 0.4% in the first quarter before the drastic falling to around 32.3% in the second quarter. These same evolutions were respectively 0.6% and 32.6% for medium-sized companies and 0.8% and 35.6% for large companies.

TABLE II. ESTIMATED IMPACT OF THE COVID-19 CRISIS ON COMPANIES BY SIZE.

	Evolution of the activity		SMALL				MEDIUM				LARGE			
					Estimated evolution (c)				Estimated evolution				Estimated evolution	
	T1	*T2*	*N(a)*	*P(b)*	*T1*	*T2*	*N*	*P*	*T1*	*T2*	*N*	*P*	*T1*	*T2*
Food and tobacco industry	7,7	0,1	48,0	0,1	0,9	0,0	40,0	0,1	0,8	0,0	31,0	0,1	0,8	0,0
Textile and Leather Industry	3,4	-45,2	21,0	0,1	0,2	-2,3	76,0	0,2	0,7	-9,2	106,0	0,3	1,2	-15,8
The Chemical and para-chemical industry	1,1	-7,9	4,0	0,0	0,0	-0,1	16,0	0,0	0,0	-0,3	5,0	0,0	0,0	-0,1
The Metal, mechanical, and electric industry	-15,0	-55,5	10,0	0,0	-0,4	-1,3	16,0	0,0	-0,6	-2,4	19,0	0,1	-0,9	-3,5
Other manufacturing industries	-0,7	-19,0	50,0	0,1	-0,1	-2,3	54,0	0,1	-0,1	-2,7	24,0	0,1	-0,1	-1,5
Construction and housing	0,9	-17,5	26,0	0,1	0,1	-1,1	35,0	0,1	0,1	-1,6	46,0	0,2	0,1	-2,7
Commerce	0,9	-26,5	180,0	0,4	0,4	-11,4	90,0	0,2	0,2	-6,4	36,0	0,1	0,1	-3,1
Tourism	-5,6	-88,9	44,0	0,1	-0,6	-9,4	33,0	0,1	-0,5	-7,8	21,0	0,1	-0,4	-6,2
Transports	-1,5	-54,3	35,0	0,1	-0,1	-4,5	15,0	0,0	-0,1	-2,2	15,0	0,0	-0,1	-2,7
Total	*****	*****	418,0	1,0	0,4	-32,3	375,0	1,0	0,6	-32,6	303,0	1,0	0,8	-35,6

c. Source: authors' estimation.

(a) The workforce of this type of company operating in the branch in question

(b) P is the weighting of the branch in the income of the PE calculated based on the workforce presented in the previous column.

(c) The estimated evolution of PE income from each branch as well as that of total income are calculated using the formula of equation (3).

These results are mainly explained by the preponderance of regressive branches such as "hotels and restaurants", "industry" and "transport". Since the firms with the highest workforce registered the largest declines, we can expect an increase in unemployment more than proportional to the decrease in turnover.

C. Impact according to turnover.

The impact of the crisis on Moroccan companies according to the number of employees examined in the previous section was interesting to evaluate to constitute an idea on the social cost of the crisis.

In this section, we will analyze the impacts according to the company's turnover in 2018, which can be considered as a structural variable that is unlikely to change in the short term. It will be difficult to assess the impacts of the crisis in all companies; for this reason, we will group them into four categories: those with a turnover lower than the first quartile, those with a turnover between the first quartile and the median, those with a figure between the median and the third quartile. The following table gives a statistical summary of the distribution by turnover.

```
                                    -------------- Quantiles --------------
Variable      n    Mean    S.D.      Min      .25      Mdn      .75      Max
------------------------------------------------------------------------------
      d2    1096  4.7e+07  2.8e+08   -9.00   6.0e+05  3.5e+06  1.5e+07  8.0e+09
------------------------------------------------------------------------------
```

Source: Compiled by the authors using data from the 2019 World Bank

We are taking the same approach as before to assess the impact of the crisis on the four groups of companies formed. Table.3 below displays the results obtained without repeating the details of the calculations.

TABLE III.   EFFECTS ON BUSINESSES.

	Q1		Q2		Q3		Q4	
Branches of economic activity	T1	T2	T1	T2	T1	T2	T1	T2
Food and tobacco industry								
Textile and Leather Industry								
Chemical and para-chemical industry	0,6	0,0	0,7	0,0	0,9	0,0	1,2	0,0
	0,2	-3,0	0,7	-9,3	0,8	-10,7	0,8	-10,6
	0,0	0,0	0,0	-0,2	0,0	-0,2	0,0	-0,3
The Mechanical, metallurgical, and electrical industry	-0,8	-2,9	-0,7	-2,7	-1,0	-3,8	-1,7	-6,3
Other manufacturing industries								
Construction and housing								
Trade	-0,1	-1,9	-0,1	-1,9	-0,1	-1,8	0,0	-1,0
	0,1	-1,3	0,1	-1,3	0,1	-1,8	0,1	-2,4
	0,3	-10,0	0,3	-8,2	0,2	-6,8	0,2	-4,5
Tourism	-0,8	-12,9	-0,5	-8,3	-0,3	-5,5	-0,3	-4,9
Transports	-0,2	-5,6	-0,1	-2,6	-0,1	-2,4	-0,1	-2,2
Total	-0,6	-37,7	0,4	-34,6	0,5	-33,0	0,2	-32,2

Source: developed by the authors using data from the 2019 WB survey.

Table 3 shows that companies with low turnover are those that have suffered the most from the covid-19 crisis in Morocco. Thus, companies in the first quartile saw their activity contract by 38% during the second quarter of 2020 against a contraction of 34%, 33%, and 32% respectively for companies in the second, third and last quartile.

This differentiated impact of the crisis on companies according to the volume of turnover is mainly explained by the branch where they carry out the most important part of their activity. The companies which achieve a turnover below the first quartile are those which operate in the most regressive industries. On the other hand,

the companies which achieve a turnover above the third quartile are those which operate in the least regressive industries and are therefore the least affected by the crisis.

4. CONCLUSION

By crossing the quarterly growth data by branch published by the HCP and the data from the 2019 WB survey on Moroccan companies reflecting the microeconomic characteristics of the latter, we were able to deduce the profile of the companies most affected by the covid-19 crisis. We have found in particular that companies employing more people are the most affected which can generate more unemployment. We have also found that companies with small sales are more affected than those with large numbers. These two results invite the public authorities to design specific measures to help both. In addition, data from the 2019 WB survey of Moroccan companies can be used to highlight other characteristics of companies affected by the covid-19 crisis in Morocco, but this is beyond the scope of this paper.

REFERENCES

[1] Bloom D., A. Mahal, AIDS, flu, and the Black Death: Impacts on economic growth and well-being, The Economics of HIV and AIDS: The Case of South and South East Asia. Delhi: Oxford University Press, 1997a (1997) 22-52.

[2] Bloom D.E, A.S. Mahal, Does the AIDS epidemic threaten economic growth, Journal of Econometrics 77 (1) (1997) 105-124.

[3] Brainerd E., M.V. Siegler, The economic effects of 1918 influenza epidemic, unpublished manuscript, accessible from HTTP: // bird flubook.com/resources/ brainerd1.pdf (2002).

[4] Fofana I, S.P. Ojo, J. Collins, An Assessment of Ebola-related Food Security Threat in Guinea, (2015). Unpublished document accessible at the link https://www.gtap.agecon.purdue.edu/resources/download/7402.pdf

[5] Haacker M.M, Modeling the macroeconomic impact of HIV / AIDS, Working Paper 02/195, International Monetary Fund 2002.

[6] UNDP Argentina, Social and Economic Impact of covid-19 and Policy Options in Argentina, https://www.undp.org/content/undp/en/home/coronavirus/socio-economic-impact-of-covid- 19.html

[7] UNDP South Africa, Socioeconomic Impact Assessment of covid-19 in South Africa https://www.undp.org/content/undp/en/home/coronavirus/socio-economic-impact-of-covid-19.html

[8] UNDP Tunisia, Economic impact of covid-19 in Tunisia - analysis in terms of the vulnerability of households and micro and very small businesses, available at the following link: https://www.undp.org/content/ UNDP / en/home/coronavirus/socio-economic-impact-of-covid-19.html.

250