



EXTENDED ABSTRACT

Title: *Regional diversification strategies in the medical equipment and supplies sector during the COVID-19 pandemic: an approach to contextual factors*¹

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Abstract:

1. Introduction

The outbreak of the COVID-19 pandemic posed enormous challenges for the global supply of medical-related products. In addition to an unprecedented increase in demand, these markets typically exported a high volume of their products to a small number of countries. Hence, the situation was particularly difficult for countries heavily dependent on external supply for such products, as was the case of Spain. Furthermore, the supply shortage of medical products was coupled with an increase in the export restrictions imposed in producing countries. To tackle these obstacles, importing countries deployed a number of policies, mostly in the form of tariff reductions on essential medical products (Leibovici and Santacreu, 2020). In this context, market opportunities, economic challenges for a number of sectors and changes in regulations may have facilitated the creation of new firms in the medical equipment and supplies sector, as well as the adoption of diversification strategies in existing ones. The main goal of the

¹ This research formed part of the project “Disentangling COVID-19 as a driving force of path development processes in Spain”, financed by the Regional Studies Association (RSA).



research project within which the present study is embedded is to elucidate the regional dimension of these latter processes in Spain. To this end, we have drawn on the theoretical framework of path development mechanisms formulated in *evolutionary economic geography* (Boschma, 2017; Hassink, Isaksen and Trippl, 2019).

In particular, we aimed to identify the contextual factors that may affect conditions for the creation or diversification of firms in the medical equipment and supplies sector: (i) Spain's position within the global medical product market; (ii) production capacity and competence, which demands a preliminary examination of this particular sector in Spain, including a regional approach; and (iii) the norms and regulations generated in the context of the COVID-19 pandemic that have affected Spanish firms².

2. Spain's dependence on imports for medical products: the case of the COVID-19 outbreak

The COVID-19 outbreak led to a worldwide increase in demand for related medical products in 2020 (Leibovici and Santacreu, 2020). Because global supply has largely concentrated on a limited number of countries (García Esteban et al., 2020), there has been significant growth in international trade flows involving exports from specialised producing countries and imports by those that were already dependent on foreign supplies.

In this section, we analyse the evolution of Spanish trade flows in COVID-19 related medical products, employing the Eurostat classification³ and conducting a comparison with the EU's performance.

2.1. An overall comparison with the EU

Table 1 shows 2019 and 2020 values for exports (columns 1 to 3), imports (columns 4 to 6) and the trade balance (columns 7 and 8) of COVID-19 related products for Spain (upper half) and the EU27 (lower half)⁴. We have also included an indicator of relative trade specialisation or foreign dependence (columns 9 to 11), which consists of the ratio between the trade balance and the sum of exports and imports.

This indicator is available for the total number of products and six broad categories defined by Eurostat's classification: 'A – Test kits/ Instruments and apparatus used in diagnostic testing', 'B – Protective garments and the like', 'C – Disinfectants and sterilisation products', 'D – Oxygen therapy equipment', 'E – Medical devices and equipment', 'F – Medical consumables' and 'G – Medical vehicles and furniture'.

In aggregate terms ('Total' row), Spanish exports of COVID-19 related products grew by 5.8% in 2020 relative to 2019, while imports increased by 11.7%. Stronger growth in foreign purchases led to a widening of the existing trade deficit with the rest of the world to over €10bn in 2020 and an increase in Spain's foreign trade dependence for these products.

² In particular, European Commission initiatives to increase production capacity, facilitating the assessment and certification process for medical equipment (*Joint European Roadmap towards lifting COVID-19 containment measures 2020/C 126/01*). Pertinent regulations in the case of Spain include temporary authorisation under the 'state of the alarm' for production of protective personal equipment (*Ministry Resolution of 23rd April*) and express authorisation for medical supplies (*Order SND/326/2020 of 6th April*).

³ The Eurostat dataset "EU trade since 2015 of COVID-19 medical supplies" (Eurostat, 2021) uses HS/CN8 classification in accordance with the latest updates of the WCO/WHO reference lists (WCO, 2020).

⁴ Exports and imports correspond to extra-EU trade of the EU27 aggregate, which corresponds to Member States as of February 2020, i.e. after the exit of the United Kingdom.



When compared with the EU27, export and import performance was very similar, signalling dependence in both areas on foreign suppliers to meet increased domestic demand. However, in contrast to Spain, this was the case for the EU aggregate despite its initial strong trade specialisation in these products. Among other factors, this latter result may reflect methodological issues related to product classification⁵.

Table 1. Exports and imports of COVID-19 related products for Spain and the EU27, total and by category

		(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)	(11)
		i. Exports			ii. Imports			iii. Balance				
		2019	2020	% change	2019	2020	% change	Absolute = (i. - ii.)		Relative = (i. - ii.) / (i. + ii.) [%]		
		2019	2020		2019	2020		2019	2020	2019	2020	pp change
SPAIN	Total	14,461	15,300	5.8	22,847	25,526	11.7	-8,386	-10,226	-22.5	-25.0	-2.6
	A - COVID-19 Test kits/ Instruments and apparatus used in diagnostic testing	969	1,153	18.9	3,058	3,717	21.6	-2,089	-2,565	-51.9	-52.7	-0.8
	B - Protective garments and the like	1,578	1,663	5.4	2,480	3,376	36.2	-901	-1,714	-22.2	-34.0	-11.8
	C - Disinfectants and sterilization products	414	532	28.6	373	437	17.2	41	95	5.2	9.8	4.6
	D - Oxygen therapy equipment	134	157	16.7	977	1,270	30.0	-842	-1,113	-75.8	-78.0	-2.2
	E - Medical devices and equipment	1,364	1,228	-10.0	3,089	3,081	-0.3	-1,725	-1,853	-38.7	-43.0	-4.3
	F - Medical consumables	9,435	10,132	7.4	12,210	13,051	6.9	-2,775	-2,919	-12.8	-12.6	0.2
	G - Medical vehicles and furniture	567	437	-23.0	661	594	-10.2	-94	-157	-7.7	-15.3	-7.6
EU27	Total	266,960	282,313	5.8	150,925	166,772	10.5	116,034	115,541	27.8	25.7	-2.0
	A - COVID-19 Test kits/ Instruments and apparatus used in diagnostic testing	47,986	55,435	15.5	27,629	32,992	19.4	20,357	22,442	26.9	25.4	-1.5
	B - Protective garments and the like	12,460	12,141	-2.6	15,161	21,278	40.3	-2,701	-9,137	-9.8	-27.3	-17.5
	C - Disinfectants and sterilization products	1,911	2,218	16.1	2,400	2,867	19.5	-489	-649	-11.3	-12.8	-1.4
	D - Oxygen therapy equipment	5,729	5,998	4.7	4,361	6,054	38.8	1,368	-57	13.6	-0.5	-14.0
	E - Medical devices and equipment	32,794	31,026	-5.4	22,986	24,361	6.0	9,808	6,665	17.6	12.0	-5.5
	F - Medical consumables	153,420	164,136	7.0	73,488	74,066	0.8	79,932	90,070	35.2	37.8	2.6
	G - Medical vehicles and furniture	12,661	11,360	-10.3	4,901	5,154	5.1	7,760	6,206	44.2	37.6	-6.6

Note: the graded colour scale for exports, imports and relative trade balance range from -50% (dark red) to +50% (dark green), while the change in the relative trade balance ranges from -15 percentage points (pp) (dark red) to +15 pp (dark green).

Source: Eurostat.

2.2. A more disaggregated approach

By product category, Spain and the EU27 again showed a very similar performance. In particular, the largest import growth was observed in both areas for categories 'B – Protective garments and the like' and 'D – Oxygen therapy equipment' (over 30% growth between 2019 and 2020), followed by 'A – Test kits/ Instruments and apparatus used in diagnostic testing' and 'C – Disinfectants and sterilisation products' (around 20% for both categories).

However, while for the first two categories (B and D), exports grew to a lesser extent and then the trade balance reduced considerably, for the other two (A and C), the increase in trade flows was much more aligned, suggesting the importance of intra-industry flows and the relatively prompter response of the production network to the increase in demand.

Before the COVID-19 outbreak, Spain's foreign trade dependence was high across most product categories (see data for 2019 in column 9), and this position became particularly accentuated for 'B – Protective garments and the like' (column 11). This was also the case for the EU27.

3. Recent business dynamics within the medical product supply sector

The analysis presented above confirms Spain's foreign dependence as regards most COVID-19 related products and the increase in the trade deficit in 2020. In this section, we explore the link between these general market conditions and the diversification

⁵ In most cases, the codes used in the classification encompass more products than the one explicitly identified in the list (Eurostat, 2021), and hence COVID-19 related specialisation might be not well captured.



strategies of firms in Spain. To this end, we conduct an exploratory analysis of the medical equipment and supplies sector based on information from the Orbis database (*Bureau van Dijk*)⁶. This activity encompasses several of the COVID-19 related products included in the broad product categories analysed in the previous section.

3.1. Approaching firm creation and diversification strategies

The demand shock, along with more flexible standards for manufacturers, may have induced changes in the business sector, especially in terms of increasing production capacity, firm diversification or firm creation (Bown, 2020). Based on a preliminary sample⁷, Table 2 shows the potential impact of these latter strategies within the sector since the beginning of 2020. As can be seen, the birth rate for firms in the medical equipment and supplies sector is clearly above that for the economy as a whole (6.64 as against 3.72 per 100 existing firms), as is the number of firms changing their activities (6.80 as against 4.68 per 100 existing firms).

Table 2. Firm creation and diversification strategies (2020-2021)

	Total economy	Medical equipment & supplies
All active firms	3,503,047	2,861
No. firms created	130,418	190
<i>per 100 active firms</i>	3.72	6.64
No. firms changing activities	164,006	196
<i>per 100 active firms</i>	4.68	6.85

Source: Orbis database.

3.2. Firm characterisation

According to theoretical debates, certain business characteristics may facilitate the emergence of the above-mentioned strategies, for example firm size, assets or income trends. Regional location may also be a factor to consider. An analysis of these characteristics confirmed that most of the active firms operating within this sector are limited companies (74.22%) and small sized firms (89.26%). In those cases for which information is available, the owners initially held a direct majority of the firms' assets. However, some key differences emerged when the sample was segmented. First, medical equipment and supplies firms that changed their activities during the pandemic tend to be older (17 years as against 14) and larger than the rest of the firms. In these cases, the number of firms that form part of a business group rises, as does the average size of these groups. Second, according to the evolution of the operating income in recent years, diversified firms present a less positive trend compared with the rest. Third, the firms' geographical distribution confirms their high concentration in Cataluña (20.7%) and Madrid (19.2%), followed by the Region of Valencia and Andalusia. During the pandemic, Madrid's position appears to have been reinforced in terms of the

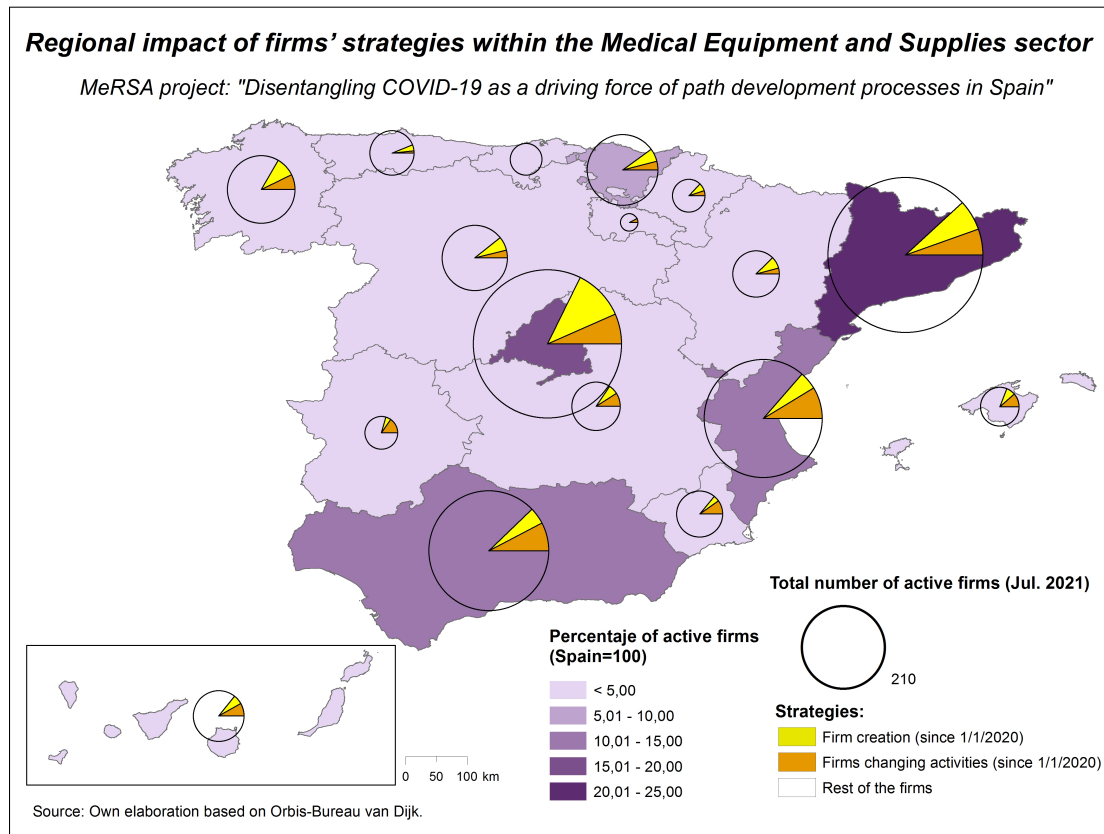
⁶ Even though there are correspondence tables available for the HS codes used in the first part and the NACE and NAIC codes, a preliminary analysis of the NACE category of Manufacture of Medical Instruments & Supplies (NACE cod. 325) confirmed the need to use the more disaggregated NAIC product classification (codes 339112 and 339113). This criterion was applied for either primary or secondary codes.

⁷ It would be necessary to refine the sample in order to distinguish new firm creation from other detected entries (i.e. acquisitions) and confirm the nature of the declared changes of activities.



number of firms changing their activities, while firm creation is overrepresented in the Region of Valencia.

Map 1.



4. Main takeaways and further research

Bearing in mind the overall goal of understanding the factors involved in the potential emergence of new regional specialisations in the production of medical equipment and supplies during the pandemic, this first study has explored the contextual factors of international trade, regulation and competition.

Thus, in the context of a global supply shortage and foreign trade dependence, the liberalisation of international trade and modifications to certification regulations may have contributed to create a window of opportunity for Spanish firms, enabling the creation of new businesses and production diversification in existing ones. Despite dataset limitations and the difficulties inherent to the use of different international classifications, our analysis suggests an influential role of a firm's position within international business groups, production capacity and the emergence of agglomeration economies. Possible extensions to this research could include, for example, the consideration of domestic production in an analysis of international trade dependences; and a qualitative approach to firms' strategies.



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