How can a country like Portugal, address entry barriers of critical technology markets, helping companies to enter and take part of large, complex, international value chains?

First investigation: Invasive Ventilators as critical technology

Goals & Motivations:
- Comprehend the invasive ventilator market shock triggered by COVID-19 and how it impacted the pre-established market entry barriers
- Understand which strategies were used by firms to deal with the global pandemic – both from an incumbent and new entrant’s perspective
- Understand how a country like Portugal may secure invasive ventilators necessary to cope with the global pandemic

Research Question:
During the global pandemic, which pre-pandemic factors contributed to entry barriers in markets critical to civilian health in Portugal?

1. Did these entry barriers change during the COVID-19 pandemic, and if so how? Did this shift generate, reduce or increase barriers to the entry for new entrants?
2. Are there national differences in new-firm entrants? If yes, what explains these differences?

Product:
- Invasive ventilator types:
  - Endotracheal intubation;
  - Tracheostomy;
- Its production is particularly workforce dependable;
- Ventilator production can be seen as an assembly of different parts;
  - Such as computers, smartphones, vacuum cleaners;
- Main parts:
  - Sources of power; Control of gas delivery;
  - Monitoring (sensors); Safety features (filters, valves)

Ventilators by numbers: Impact of COVID-19

<table>
<thead>
<tr>
<th>Country</th>
<th>People</th>
<th>Previous N ventilators</th>
<th>Previous ratio (people per ventilator)</th>
<th>N ventilators to be acquired</th>
<th>Intended ratio (people per ventilator)</th>
</tr>
</thead>
<tbody>
<tr>
<td>United States</td>
<td>331M</td>
<td>200,000 units¹</td>
<td>1 ventilator for 1665 people</td>
<td>187,000</td>
<td>1 ventilator for 1170 people</td>
</tr>
<tr>
<td>United Kingdom</td>
<td>67.89M</td>
<td>8,000 units¹</td>
<td>1 ventilator for 8487 people</td>
<td>50,000</td>
<td>1 ventilator for 560 people</td>
</tr>
<tr>
<td>Portugal</td>
<td>10.3M</td>
<td>1,142 units²</td>
<td>1 ventilator for 9208 people</td>
<td>500</td>
<td>1 ventilator for 5150 people</td>
</tr>
</tbody>
</table>

References:
3. www.bloomberg.com/2020/04/03/coronavirus-ventilators-scraping-up-supply-shelves/
6. https://www.ncbi.nlm.nih.gov/pmc/articles/PMC7275570/
7. https://www.bjma.org/article/S1098-113X(20)30011-0/fulltext
9. www.cdc.gov
10. www.ccmpractice.com/