**Supplementary material**

Table 1 Measuring items.

|  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- |
| Code | Item description | Outer loadings | VIF | CR | AVE | Cronbach's Alpha |
| **SCRes:** Ali et al. (2023) | |  |  | 0.869 | 0.715 | 0.867 |
| SCR1 | We are able to proactively update people, processes and systems in line with the changes in the external business environment. | 0.828 | 1.972 |  |  |  |
| SCR2 | We have the capabilities and resources to effectively respond and adapt to unforeseen risks. | 0.823 | 1.887 |  |  |  |
| SCR3 | We have multiple sources of suppliers and customers. | 0.855 | 2.195 |  |  |  |
| SCR4 | We have the capabilities and resources to absorb and recover quickly from unexpected disruptions. | 0.876 | 2.413 |  |  |  |
| **Information sharing and resource integration (G1):**  Dubey et al. (2020) | | | | 0.892 | 0.823 | 0.892 |
| CO1 | We routinely share resources (i.e. information, expertise and infrastructure) among our SC partners. | 0.897 | 2.411 |  |  |  |
| CO2 | We work closely with our SC partners to design and implement operations in response to disasters. | 0.911 | 2.780 |  |  |  |
| CO3 | We share our risks and benefits with our SC partners. | 0.913 | 2.857 |  |  |  |
| **Rapid recognition and timely response (G2):**  AlNuaimi et al. (2022) | | | | 0.892 | 0.803 | 0.878 |
| SCA1 | We can rapidly adapt production, processes and activities to meet fluctuations in demand. | 0.904 | 2.468 |  |  |  |
| SCA2 | We can cope with problems from suppliers and partners rapidly. | 0.869 | 2.249 |  |  |  |
| SCA3 | We can implement decisions rapidly to respond to market and policy changes. | 0.914 | 2.533 |  |  |  |
| **Dynamic adjustments for continuous operation (G3):** Aboelmaged (2018) | | | | 0.877 | 0.791 | 0.868 |
| SCF1 | The number of goods/services we offer can change rapidly. | 0.872 | 2.199 |  |  |  |
| SCF2 | We are able to introduce new goods/services quickly. | 0.909 | 2.420 |  |  |  |
| SCF3 | We are able to customize goods/services to meet customer needs. | 0.887 | 2.235 |  |  |  |
| **Backup resources and contingency plans (G4):**  Chowdhury and Quaddus (2017) | | | | 0.876 | 0.788 | 0.866 |
| RD1 | We have backup suppliers. | 0.905 | 2.304 |  |  |  |
| RD2 | We have a buffer stock of products. | 0.888 | 2.275 |  |  |  |
| RD3 | We have backup transportation channels. | 0.871 | 2.175 |  |  |  |
| **Transparency and predictive capacity (A1):**  Qader et al. (2022) | | | | 0.862 | 0.695 | 0.854 |
| SCV1 | Our suppliers are able to share inventory availability with us timely. | 0.864 | 2.096 |  |  |  |
| SCV2 | Our suppliers are able to provide us with advance shipment notices timely. | 0.803 | 1.862 |  |  |  |
| SCV3 | We obtain information from various sources to understand the overall market level supply and demand information timely. | 0.832 | 1.908 |  |  |  |
| SCV4 | Our SC partners are able to provide us with timely information on the status of goods in the distribution network. | 0.834 | 1.925 |  |  |  |
| **Agriculture 4.0 and digital transformation (A2):**  Le et al. (2024) | | | | 0.866 | 0.711 | 0.865 |
| SCI1 | With the digital transformation, we will be able to take better advantage of SCM practices. | 0.848 | 2.055 |  |  |  |
| SCI2 | Digital transformation enhances the flexibility of SCM in our company. | 0.842 | 2.102 |  |  |  |
| SCI3 | We benefits from digital transformation in terms of inventory and warehousing costs. | 0.850 | 2.111 |  |  |  |
| SCI4 | We benefits from digital transformation in terms of logistics and transportation processes. | 0.834 | 1.912 |  |  |  |
| **Continuous learning and knowledge management (A3):**  Waqas et al. (2023) | | | | 0.869 | 0.787 | 0.865 |
| KM1 | We can generate new knowledge from existing knowledge. | 0.871 | 2.142 |  |  |  |
| KM2 | We are able to utilize new knowledge. | 0.893 | 2.212 |  |  |  |
| KM3 | We are able to update our knowledge timely. | 0.897 | 2.387 |  |  |  |
| **Government Support (A4):**  Falahat et al. (2021) | | | | 0.865 | 0.707 | 0.861 |
| GS1 | We have received government support related to information. | 0.826 | 1.876 |  |  |  |
| GS2 | We have received government support related to training. | 0.861 | 2.173 |  |  |  |
| GS3 | We have received government support related to trade mobility. | 0.863 | 2.220 |  |  |  |
| GS4 | We have received government support related to subsidies. | 0.811 | 1.867 |  |  |  |
| **Climate change awareness (C1):**  Todaro et al. (2020) | | | | 0.866 | 0.789 | 0.866 |
| SA1 | Global warming and increasing frequency of extreme weather events will affect individual habits and lifestyles. | 0.877 | 2.126 |  |  |  |
| SA2 | Environmental emergencies and extreme weather events may have relevant consequences on production activities and assets. | 0.902 | 2.495 |  |  |  |
| SA3 | The increasing frequency and intensity of extreme weather events may cause severe implications to the SC. | 0.884 | 2.208 |  |  |  |
| **Diversification of agricultural products and SC networks (C2): Adapted from** Lin (2011), Lin et al. (2021) | | | | 0.858 | 0.778 | 0.857 |
| DV1 | Diversified agricultural systems are essential to adress the challenges of climate change. | 0.884 | 2.194 |  |  |  |
| DV2 | Diversified SC structures can effectively reduce climate risk. | 0.887 | 2.153 |  |  |  |
| DV3 | Supporting wider adoption of diversified planting or farming practices in agricultural production is necessary. | 0.876 | 2.097 |  |  |  |
| **Taking proactive climate action (C3):**  Todaro et al. (2021) | | | | 0.864 | 0.775 | 0.856 |
| AD1 | We will modify the procurement strategy in response to climate risks. | 0.886 | 2.036 |  |  |  |
| AD2 | Our suppliers or customers will participate in GHG emissions mitigation initiatives. | 0.866 | 2.138 |  |  |  |
| AD3 | Our suppliers or customers will participate in climate change adaptation initiatives (e.g., disclosure of CSR reports, development of green finance and investment). | 0.889 | 2.245 |  |  |  |
| **Sustainable development orientation (C4):**  Aboelmaged and Hashem (2019) | | | | 0.863 | 0.783 | 0.861 |
| SS1 | We have a clear policy statement urging environmental awareness. | 0.894 | 2.283 |  |  |  |
| SS2 | We promote environmental preservation as a company goal. | 0.876 | 2.052 |  |  |  |
| SS3 | We are responsible for preserving the environment. | 0.884 | 2.283 |  |  |  |

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