

Model Overview

This Appendix presents the created Vensim model and its subsystems. In Figure A.1, you can find how different parts of the model presented in the following pages are connected to each other.

How many people are infected in the SEIR model, presented in Figure A.2, depends on the public behaviour regarding contact restrictions (A.3, A.4, A.5), and the susceptible population. How many people can be treated in hospitals in the SEIR model, depends the hospital capacities (A.6). On the other hand, the SEIR model determines the demand for PPE and ventilators (A.7, A.8). The resulting shortages of PPE and ventilators depends on the demand and supply of PPE (A.9,A.11). Which supply strategies are applied and how many products are ordered, depends on the decision framework (A.13), which is based on the shortages of PPE and ventilators. Supply strategies are shown in Figures A.14, A.15, A.16, A.17, A.18, and A.19 The deliveries of PPE and ventilators feed back to the hospital capacities, as well as the shortage of PPE and ventilators.

Since the decision framework and supply strategies follow the same structure for PPE and ventilators, this appendix focuses on the case for ventilators.

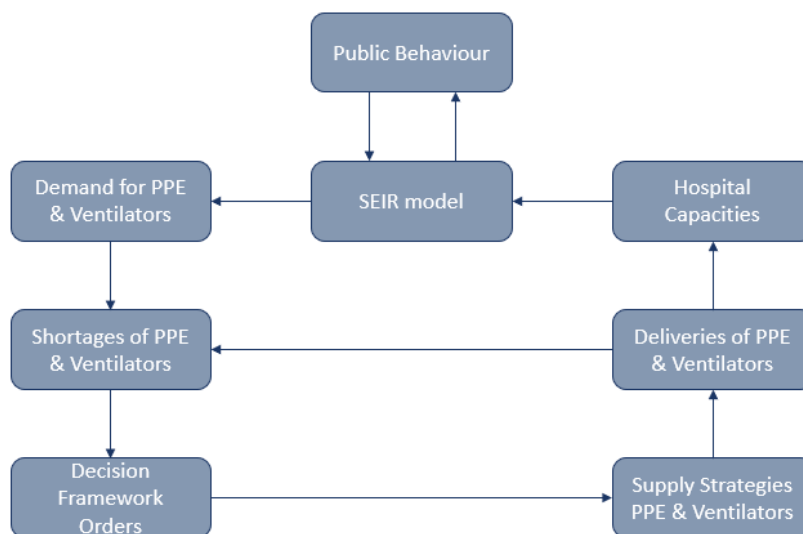


Figure A.1: Connections between subsystems modelled in Vensim

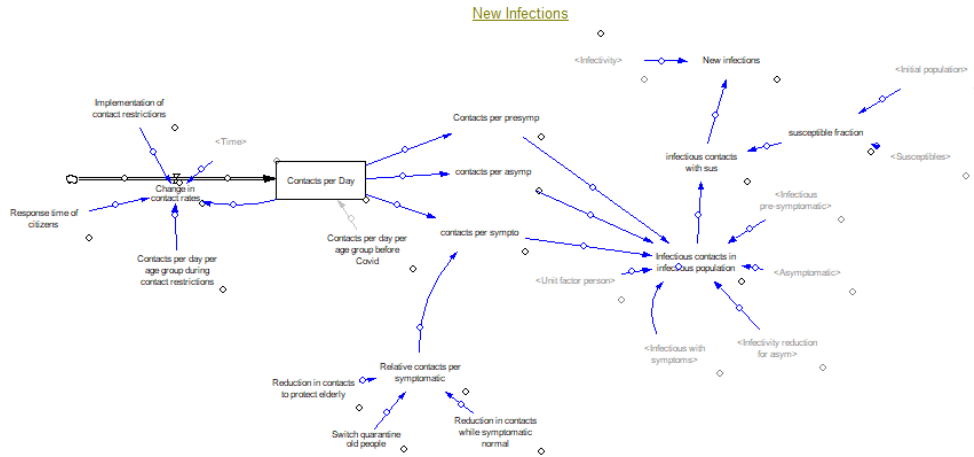


Figure A.3: Development of New Infections based on Contact Restrictions

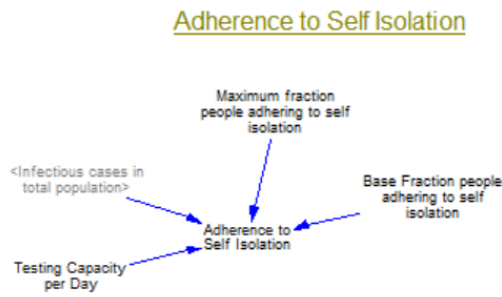


Figure A.4: Changes in Adherence to Self-Isolation

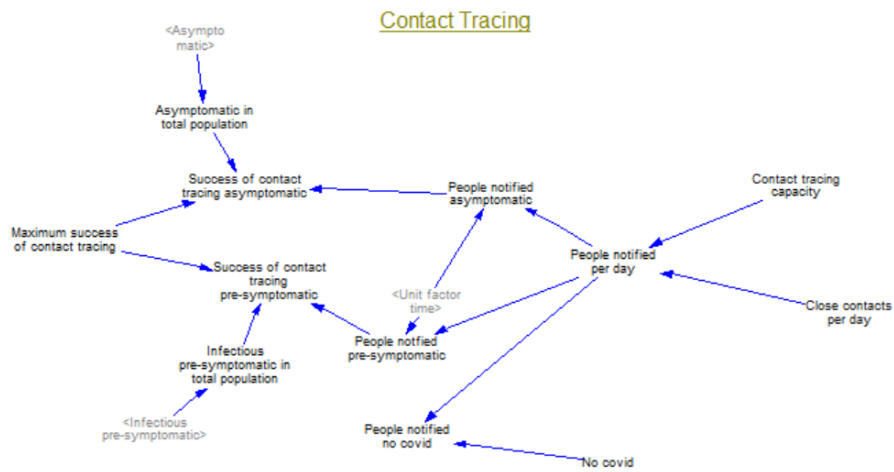


Figure A.5: Impact of Contact Tracing

Hospital Capacities

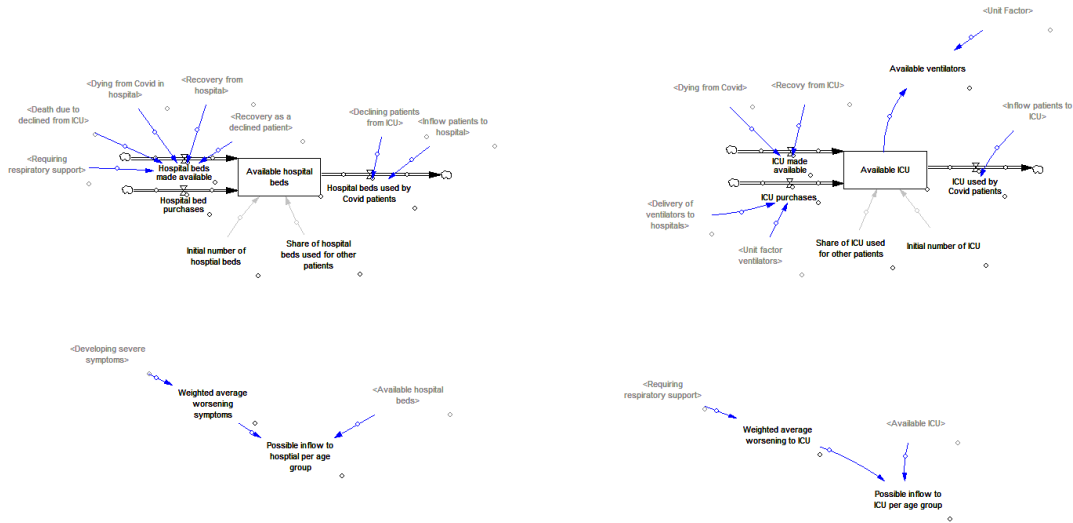


Figure A.6: Hospital Capacities

PPE Demand from Hospitals

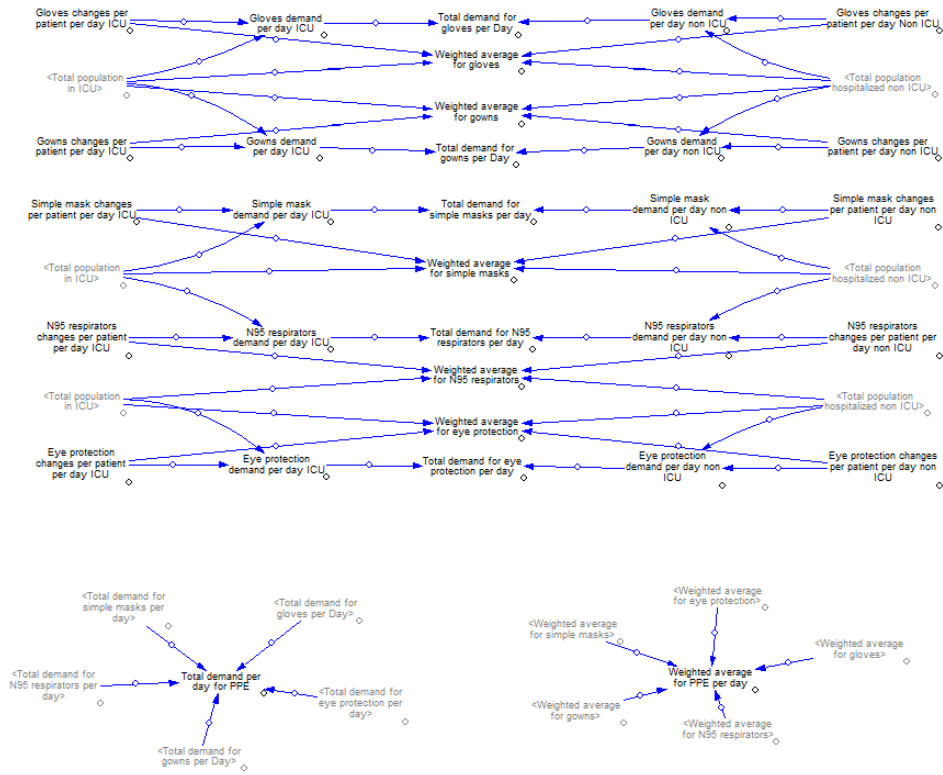


Figure A.7: Demand for PPE per Day

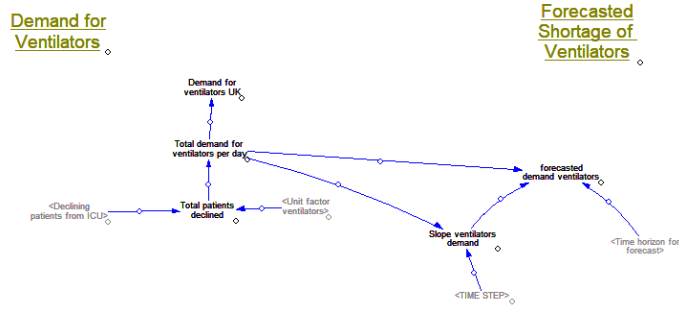


Figure A.8: Demand for Ventilators per day

Shortage of PPE in UK

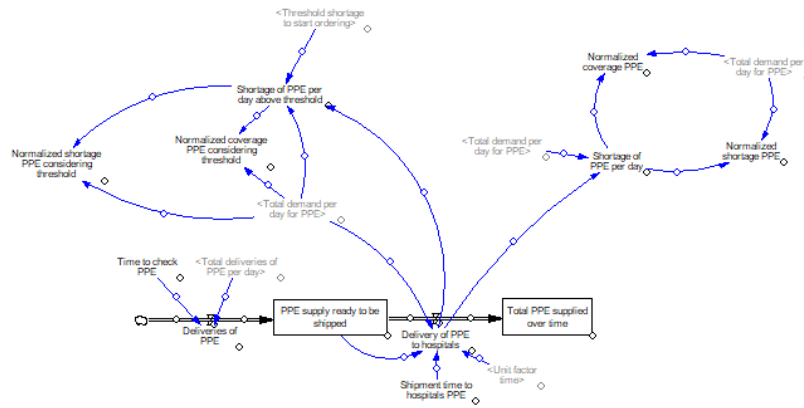


Figure A.9: Shortage of PPE per day based on the deliveries per day

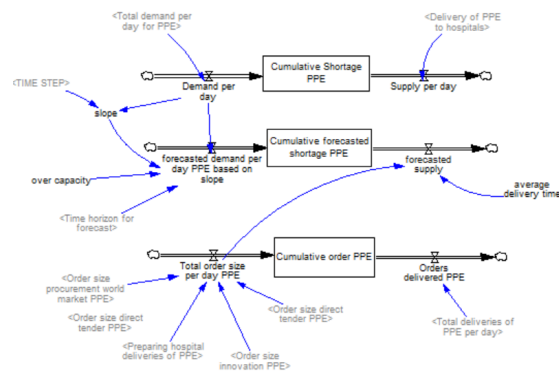


Figure A.10: Focus on forecasted demand of PPE. The entire figure gives an overview of cumulative orders.

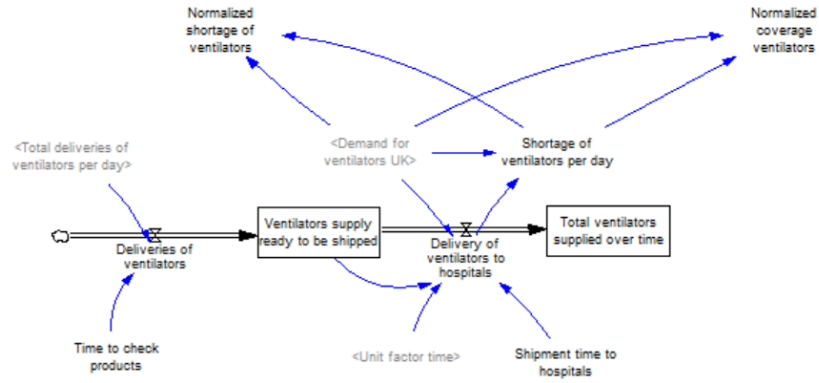


Figure A.11: Shortage of ventilators per day based on the deliveries per day

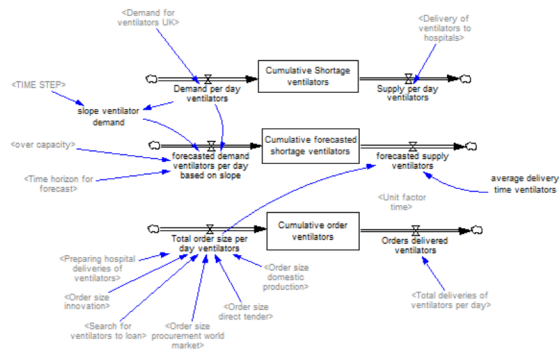


Figure A.12: Focus on forecasted demand for ventilators. The entire figure gives an overview of cumulative orders..

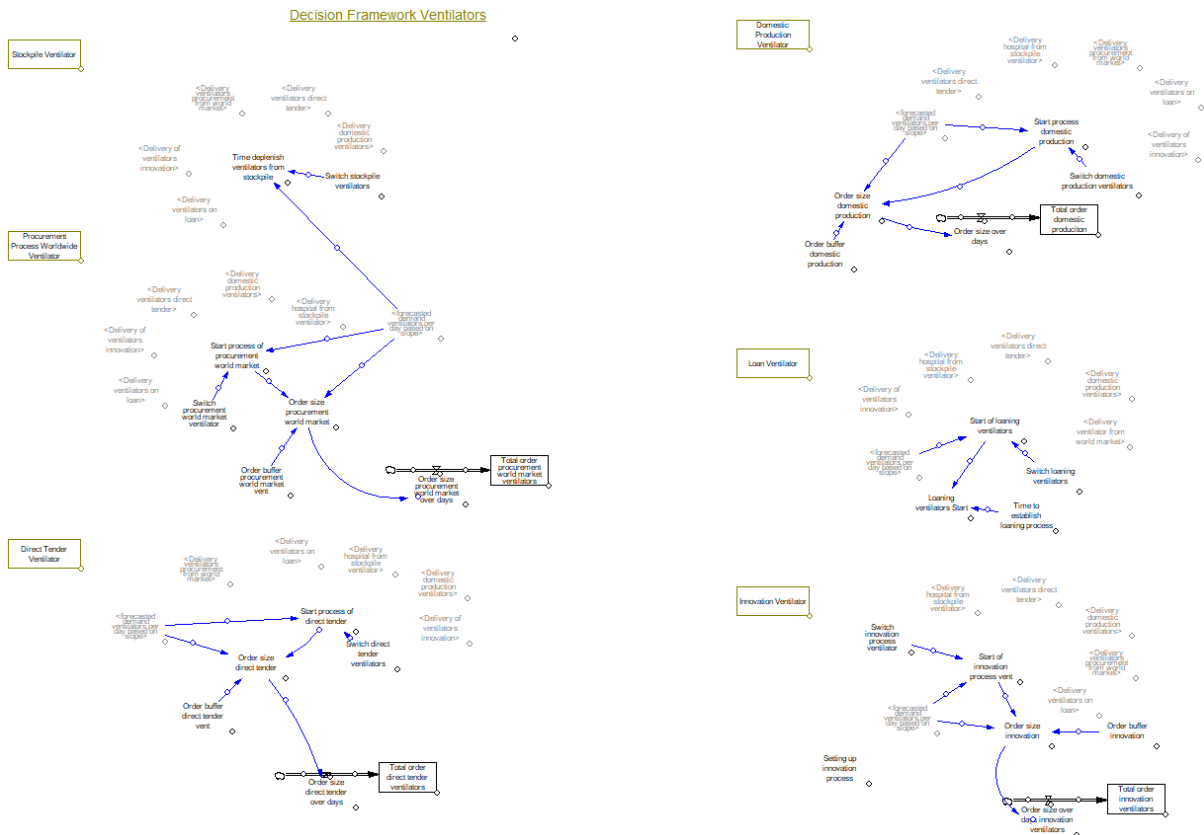


Figure A.13: Overview of decision framework for ventilators

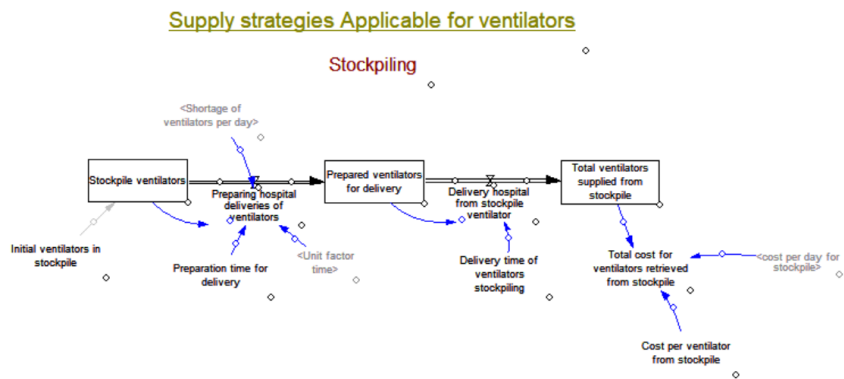


Figure A.14: Stockpiling as a supply strategy

Loaning Products

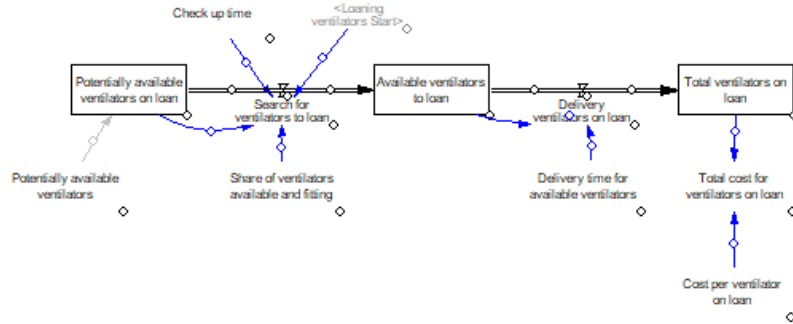


Figure A.15: Loaning ventilators as a supply strategy

Domestic Production

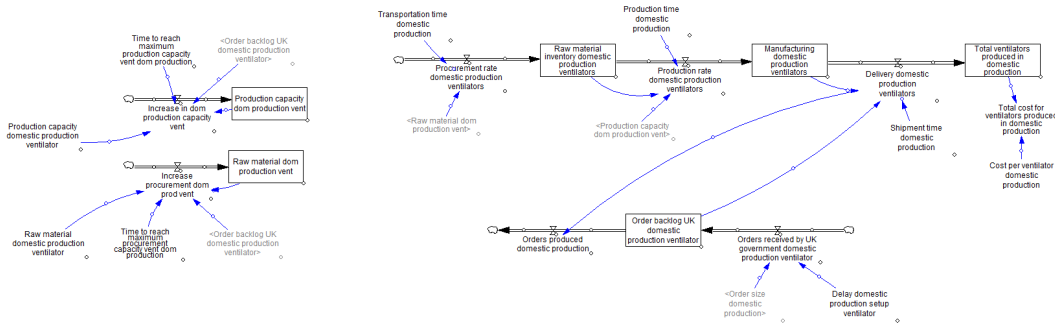


Figure A.16: Domestic production as a supply strategy

Innovation

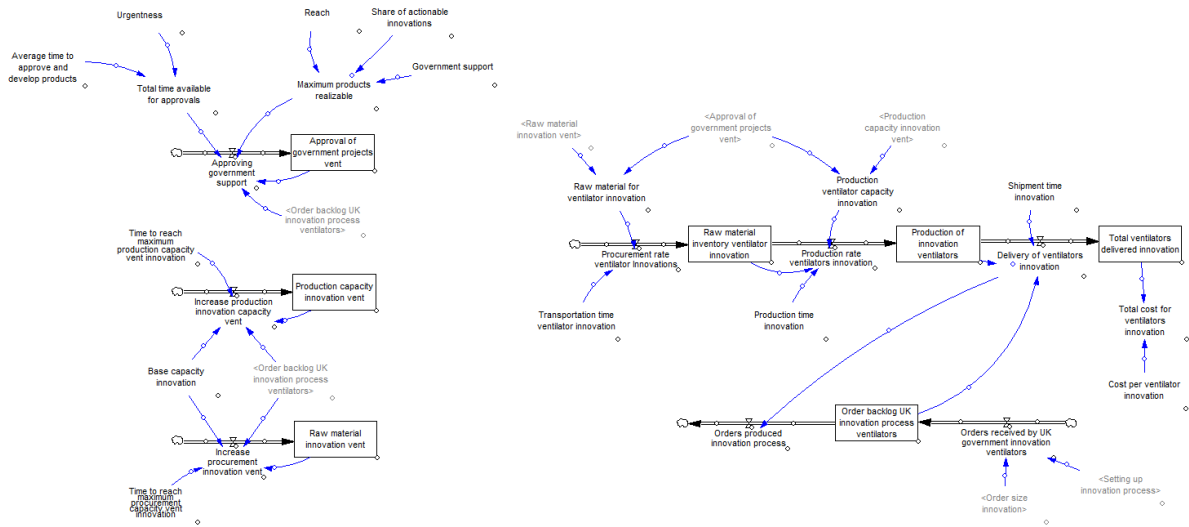


Figure A.17: Innovation as a supply strategy

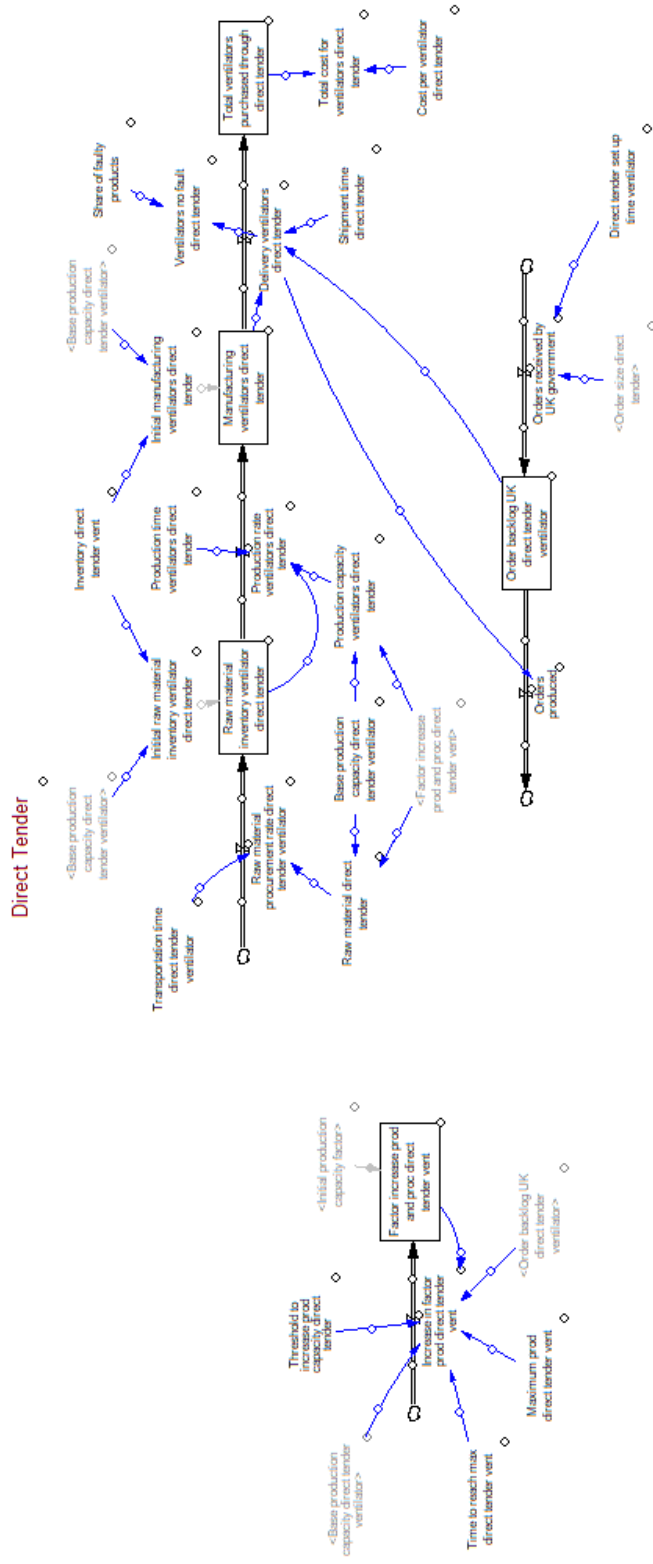


Figure A.18: Direct tender as a supply strategy

Procurement World Market

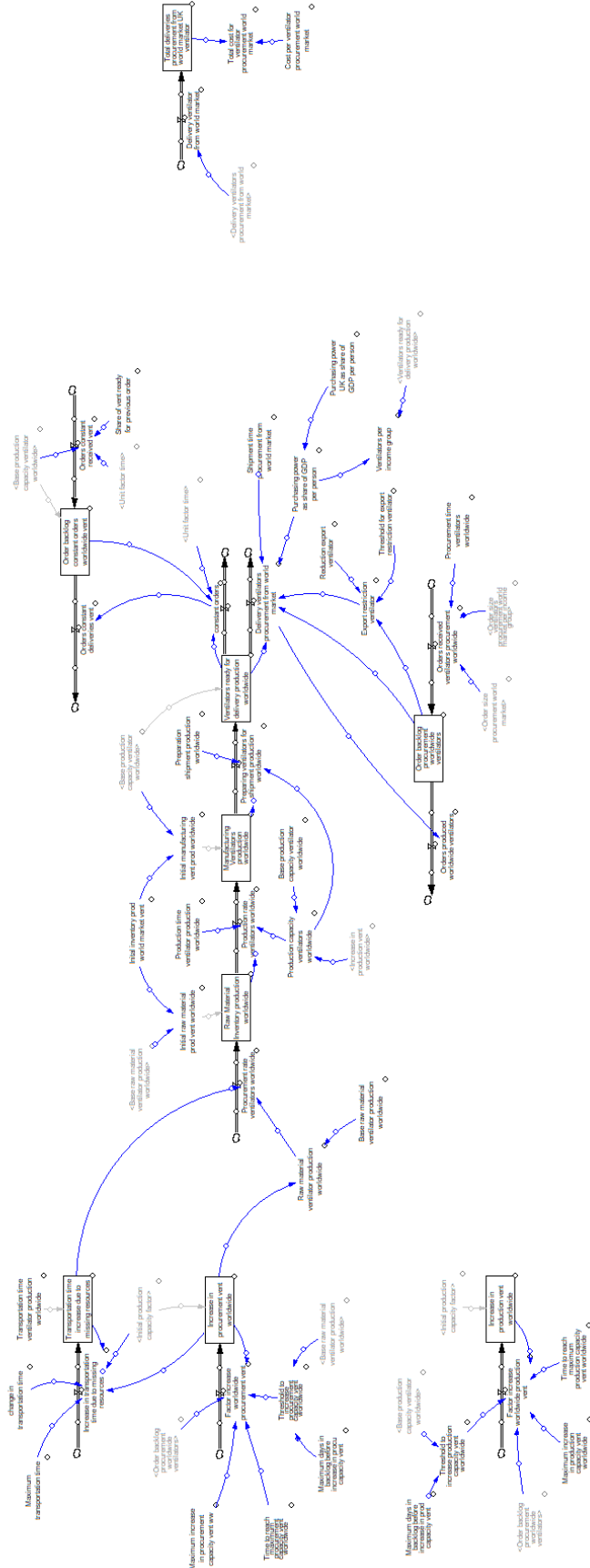


Figure A.19: Procurement from the world market as a supply strategy