A simple model of globalization (and deglobalization)

1. Elements of the model

- The model considers globalization from a very abstract point of view: there is an index g (taking values between 0 and 1) that measures the degree of globalization (how open an economy is or how integrated it is with the rest of the world). The index would give a precise meaning to the question of how globalized an economy is: more globalized would mean an index value closer to 1 and less globalization an index value closer to 0. The KOF Globalisation Index could be an example; see https://kof.ethz.ch/en/forecasts-and-indicators/indicators/kof-globalisation-index.html.
- The model includes three agents: government, the elite (the most influential people in the domestic private sector: mainly, the leaders of large companies, banks, business associations, investment funds…) and 'the mass' (the majority of people).
- The model consists of three elements. The first is a relationship between the globalization index g and the net benefit B_E that the elite obtains when the economy has globalization index g. A function is assumed to represent this relationship. This function is supposed initially decreasing and eventually increasing. Fig. 1 shows the function relating the level of globalization to the benefit that the elite obtains with that level.

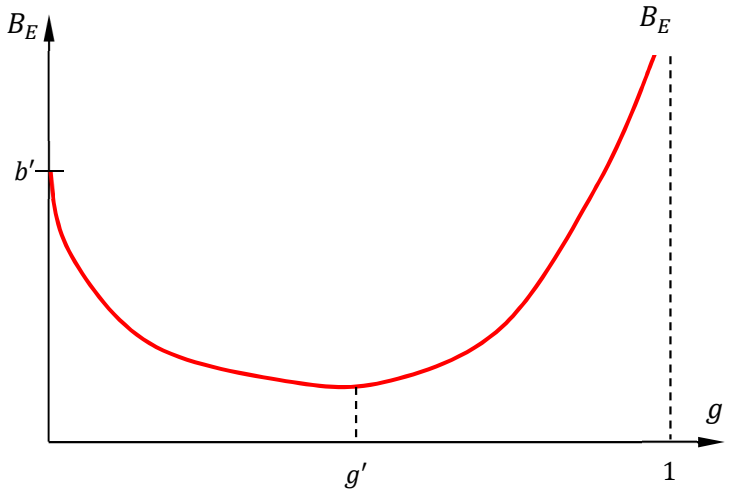


Fig. 1. Elite benefit and globalization level

- The second is a relationship between the globalization index g and the net benefit B_E that the mass obtains when the economy has globalization index g. A function is assumed to represent this relationship. The function is supposed initially increasing and eventually decreasing. Fig. 2 shows the function relating the level of globalization to the benefit that the mass gets with that level.

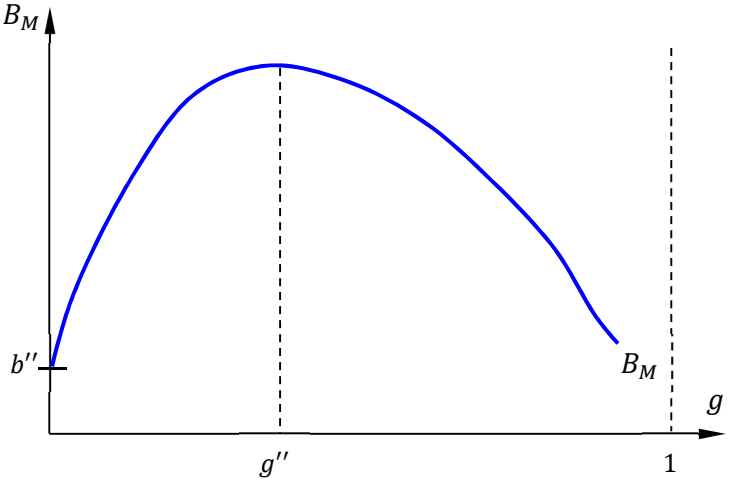


Fig. 2. Mass benefit and globalization level

- It is plausible to postulate alternative forms of the functions B_E and B_M. A justification for the functions in Fig. 1 and Fig. 2 is that:

- without globalization (under autarky), the elite fully exploits its privileges to obtain a net benefit (value b' in Fig. 1) greater than the mass (value b'' in Fig. 2);
- the first steps towards globalization limit the privileges of the elite and favour the interests of the mass (measures that stimulate competition, competitiveness, innovation, employment, quality jobs and combat personal and territorial inequalities and the negative externalities that are generated without the regulation expressed in industrial policy);
- for the elite there is a globalization level (represented by index g' in Fig. 1) beyond which further globalization is beneficial to the interests of the elite (because the elite learns from foreign elites how to take advantage of globalization and/or because they elite acts as pressure group to tilt economic policies under globalization in their favour);
- similarly, for the mass there is a globalization level (index g'' in Fig. 2) beyond which globalization creates more harm than benefit (domestic jobs outsourced, more migrants competing for domestic jobs and Rodrik's trilemma in the form of foreign elites lobbying for policies that go against the interest of the mass).

- Finally, the government decides the globalization level (a value g of the globalization index) based on some criterion related to mass and elite benefits.

2. Solution to the model I: proportional profit distribution rules

- A very simple criterion would be to choose g to maximize or minimize the benefit of some of the two groups, or some weighted average. For example, if the criterion were to maximize the benefit of the mass and this were represented by Fig. 2, then the government would choose g''.
- A more interesting criterion would involve choosing a value g that would preserve a certain proportional distribution of benefits between the two groups. Specifically, by choice of the government or by constitutional principle, there is a distribution rule of the type

$$B_E = \alpha \cdot B_M$$

  according to which the benefit of the elite is proportional to that of the mass: the government only chooses some value g with which the benefit of the elite is α times the benefit of the mass, where $\alpha > 0$.
- For example, the case $\alpha = 1$ (the level of globalization generates the same benefits to both groups) facilitates the graphical identification of the solution: in Fig. 3, the government would choose one of the values g associated with the intersections a and b of the benefit functions.
- This criterion does not guarantee a unique solution: in Fig. 3, the value g_a and the value g_b are consistent with the fulfillment of the distribution rule $B_E = B_M$. Since with g_a the benefit of both groups is higher than with g_b it is tempting to think that the government has reason to discard g_b. The fact is that g_b could be reached involuntarily, due to some event that has modified one of the benefit functions. Moreover, preferring g_a to g_b would entail adding an additional requirement to the distribution criterion.

- Another feature of the solution of the model with proportional distribution rules is that initially there would be indeterminacy in the solution when any change in the benefit functions occurs.
- As an illustration, if some event occurs in Fig. 3 that causes the mass to have a larger benefit for every level of globalization, their benefit function shifts upwards from B_M to $B_M{}'$ as shown in Fig. 4.

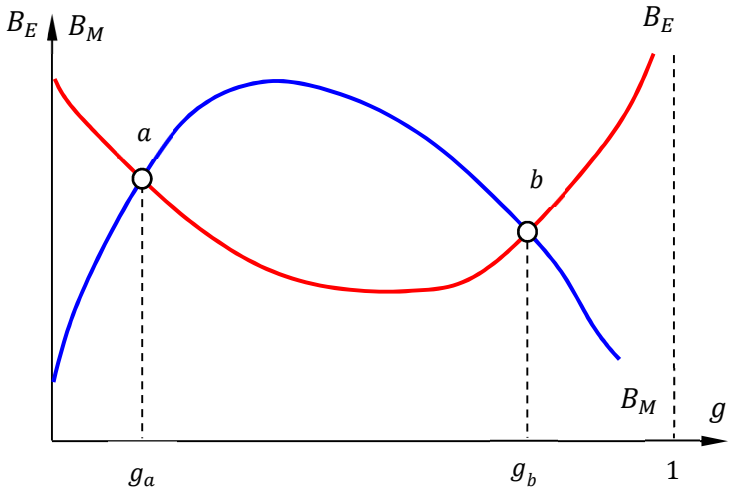


Fig. 3. Solution of the model with equal benefits

- With $B_M{}'$ the points a' and b' represent the possible new solutions. A selection criterion is to choose the solution closest to the previous one. For example, if initially the point a defined the solution (with globalization index g_a), the shift in function B_M would lead to solution a' (with a lower index). And if b defined initially the solution (with globalization index g_b), the shifh in function B_M would lead to solution b' (with a higher index).

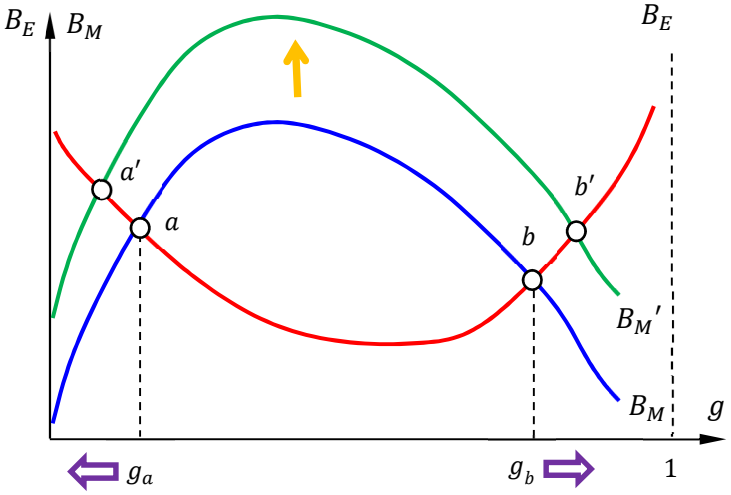


Fig. 4. Comparative statics of the model

- This solution of the model can lead to paradoxical results. In particular, if the event causing the change in Fig. 4 also positively affected the elite's benefit function, the resulting situation would be that in Fig. 5. In this case, if the initial solution is represented by a and the new solution by a', then an event making more globalization more beneficial for everyone (elite and mass) would lead to a globalization decline.

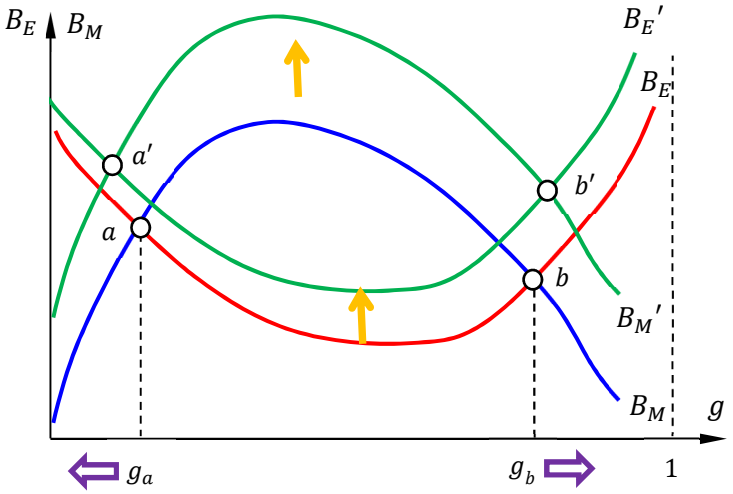


Fig. 5. Comparative statics of the model

- On the contrary, with the solution moving from b to b', there is a globalization deepening when the event causing the transition makes globalization more beneficial for everyone.

- It could be interpreted that the solutions a and a' in Figs. 3, 4 and 5 would be more likely in less advanced economies (which tend to be less globalized because less developed economies tend to be less prepared to tackle globalization challenges) and that the solutions b and b' in Figs. 3, 4 and 5 would be more likely in more advanced economies (characterized by a higher degree of globalization).
- What if $\alpha \neq 1$? If $\alpha > 1$, the rule states that globalization should benefit the elite more; and if $\alpha < 1$, the mass should benefit the most. Graphically the model can be solved as with $\alpha = 1$ by appropriately shifting some function. For example, if $\alpha = 2$, the solution would be given by the intersection between the original function B_E and the new function $B_{M'}$ that has twice the value of the original B_M ($B_{M'}$ would come from B_M by shifting it upwards, as in Fig. 4, so that the height of $B_{M'}$ is always twice the height of B_M).
- **Numerical example.** The mass benefit function is

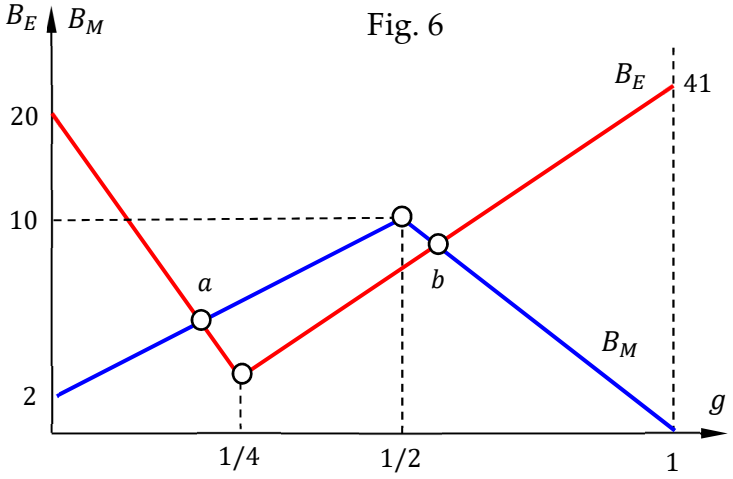
$$B_M = \begin{cases} 2 + 16d & if \ \ 0 \leq d \leq \frac{1}{2} \\ 20 - 20d & if \ \ \frac{1}{2} < d \leq 1 \end{cases}$$

and the function of the elite is

$$B_E = \begin{cases} 20 - 72d & if \ \ 0 \leq d \leq \frac{1}{4} \\ -11 + 52d & if \ \ \frac{1}{4} < d \leq 1. \end{cases}$$

Fig. 6 represents the functions, but not to scale. It is left as an exercise to find the values associated with points a and b, and to represent the transformed function of B_M if the solution must satisfy $B_E = 2B_M$.

Fig. 6



3. Solution to the model II: profit thresholds

- Another criterion for determining the choice of the extension of industrial policy would consist of choosing any index value that guaranteed at least a benefit $\bar{b}$ to all groups.
- Fig. 7 illustrates the possibilities of this criterion. Now sets of values are admissible, but there is still a discontinuity of solutions. In Fig. 7 only the indices in the interval g_a and in the interval g_b meet the requirement that the adopted globalization index guarantee the benefit $\bar{b}$ to both groups.
- By modifying the threshold, $\bar{b}$ one of the two intervals can be eliminated (if the threshold line is between the two intersection points of the functions). It is even possible to have no solution with $\bar{b}$ being a sufficiently high threshold.
- Variants of this criterion:
    - that the threshold sets a maximum benefit, not a minimum one;

- that the threshold is an interval (that the globalization benefit is greater than a minimum value but less than a maximum value);
- that the threshold (for example, if it is a minimum) depends on the index, so that instead of representing the threshold using a horizontal line, it is done using an upward-sloping or a downward-sloping line (or even a curve).

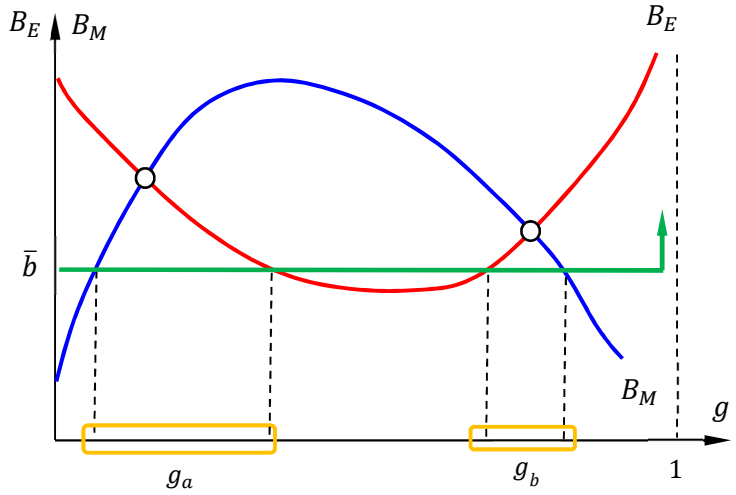


Fig. 7. Solution of the model with a minimum threshold

- **Exercise.** In the numerical example in the previous section, determine the admissible values of the index if
  - $\bar{b} = 4$ is the minimum threshold;
  - $\bar{b} = 6$ is the maximum threshold;
  - $\bar{b} = 4$ is the maximum threshold;
  - the maximum threshold is 6 and the minimum 4;
  - $B = 3 + 4d$ sets the minimum threshold;
  - $B = 3 + 4d$ sets the maximum threshold.