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Sustainability thought 161: How to link the market structure-population dynamics-system stability framework to the concept of responsible and irresponsible market pricing? What are the main implications of doing this?

By

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Abstract

Market structure-population dynamics-system stability framework based thinking tells us that the nature of the market price is the root cause of positive or negative impacts on system stability as it shapes the behavior of the populations it serves. If the nature of the market price is responsible then it has a positive impact on system stability as it shapes population behavior that stays below the carrying capacity of the system, but if the nature of the market price is irresponsible it has a negative impact on system stability as it leads to overshooting human behavior. In other words, the market structure-population dynamics-system stability framework has two loops, one positive and one negative, which can be systematically linked to responsible and irresponsible behavior respectively. Hence, there is a need for simple ideas on how to systematically look at system stability issues from the market responsibility/irresponsibility point of view. And this raises the question: How to link the market structure-population dynamics-system stability framework to the concept of responsible and irresponsible market pricing? What are the main implications of doing this? Among the goals of this paper is to provide answers to those questions.

Key words

Market structure, responsible market structure, irresponsible market structure, irresponsible market price, responsible market price, irresponsible market price, production, responsible production, irresponsible production, consumption, responsible consumption, irresponsible consumption, population dynamics, responsible population dynamics, irresponsible population dynamics, overshoot, no overshoot, system stability, global warming, responsible behavior, irresponsible behavior.

Introduction

a) The extended market structure, population dynamics and system stability framework(M-T-R framework)

Market structure-population dynamics-system stability framework based thinking tells us that the nature of the market price(MP) is the root cause of positive or negative impacts on system stability(R) as it shapes the behavior of the populations(T) it serves(Muñoz 2022), as shown in Figure 1 below:

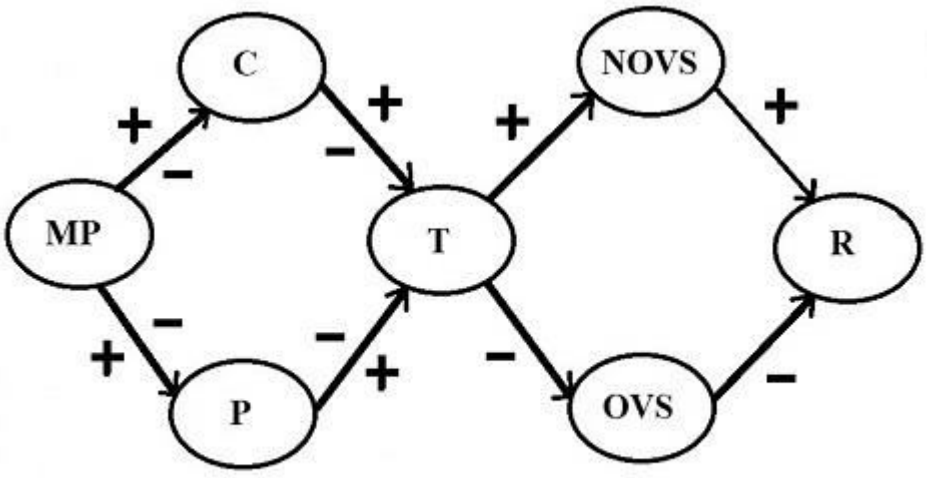

Figure 1 Extended general market structure, population dynamics and system stability framework (M-T-R framework)

We can appreciate based on Figure 1 above that if the nature of the market price(MP) is responsible then it has a positive impact on system stability(R) as it shapes population behavior(T) that stays below the carrying capacity of the system(NOVS), but if the nature of the market price(MP) is irresponsible it has a negative impact on system stability(R) as it leads to overshooting human behavior(OVS). In other words, the market structure-population dynamics-system stability framework(M-T-R framework) in Figure 1 above has two loops, one positive

and one negative, which can be systematically linked to responsible and irresponsible behavior respectively. Those two loops are described in detail below.

b) The positive loop of the extended market structure, population dynamics and system stability framework(M-T-R framework)

The positive loop is formed by having a market price(MP) that has a positive system stability impact on consumption(C) and production(P), which in turn have a positive system stability impact on population dynamics(T), which in turn has a positive impact on system stability(R) as there is no overshooting(NOVS), as indicated in Figure 2 below:

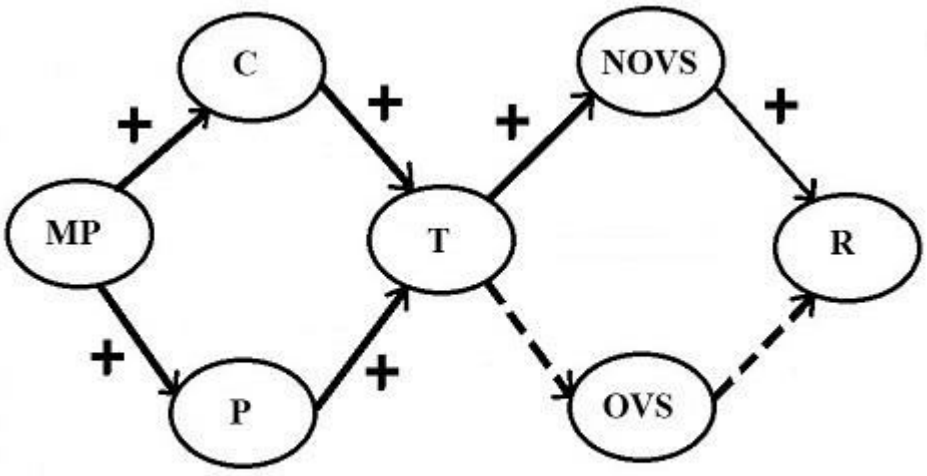

Figure 2 The positive loop of the extended general market structure, population dynamics and system stability framework (M-T-R framework)

We can see based on Figure 2 above that the root cause of the positive impact on system stability R is nature of the market price MP as it shapes the positive loop. Notice that the sustainable or responsible production and consumption framework being implemented by the UN/UNEP(UN 2015; UN 2020) in support of SDG 12 is consistent with this positive loop framework if we assume both market price nature neutrality and population dynamics neutrality as in this framework the root cause of responsible system stability is responsible consumption and production.

c) The negative loop of the extended market structure, population dynamics and system stability framework(M-T-R framework)

The negative loop is formed by having a market price(MP) that has a negative system stability impact on consumption(C) and production(P), which in turn have a negative system stability impact on population dynamics(T), which in turn has a negative impact on system stability(R) as there is overshooting behavior(OVS), as shown in Figure 3 below:

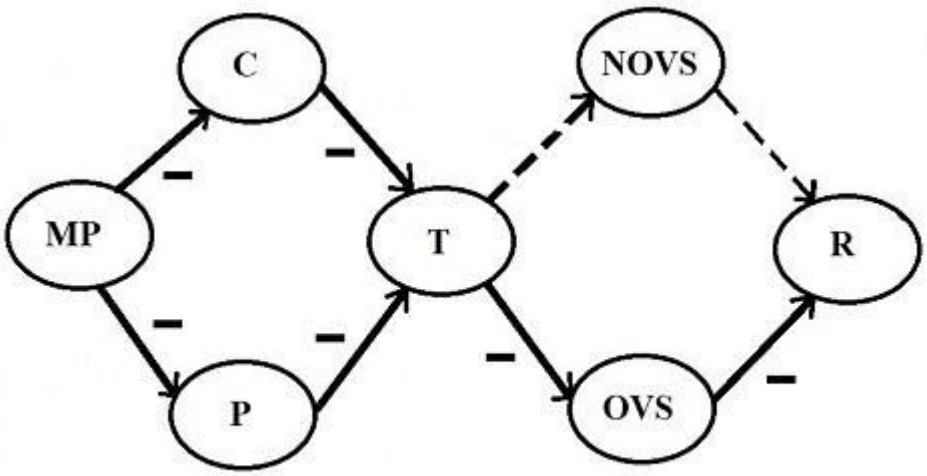

Figure 3 The negative loop of the extended general market structure, population dynamics and system stability framework (M-T-R framework)

We can appreciate based on Figure 3 above that the root cause of the negative impact on system stability R is nature of the market price MP as it shapes the negative loop. Notice that the overpopulation driven ecological overshoot idea(Rees 2022) is consistent with this negative loop framework if we assume full market structure dynamics neutrality as in this framework the root cause of irresponsible system stability is irresponsible populations.

d) The need to link the different loops to responsible pricing and irresponsible pricing to system stability issues

Hence, there is a need for simple ideas on how to systematically look at system stability issues consistent with global warming from the market responsibility/irresponsibility point of view. And this raises the question: How to link the market structure-population dynamics-system stability framework to the concept of responsible and irresponsible market pricing? What are the main implications of doing this? Among the goals of this paper is to provide answers to those questions.

Goals of this paper

a) To highlight the structure of the responsible market structure, responsible population dynamics and responsible system stability framework and stress the main implications supported by this framework; and b) To point out the structure of the irresponsible market structure, irresponsible population dynamics and irresponsible system stability framework and share the main implications supported by this framework.

Methodology

First, the terminology, some operational concepts and merging rules are shared. Second, the way the positive loop of the general market structure-population dynamics and system stability framework is linked to responsible market pricing is highlighted while listing the main implications consistent with it. Third, the way the negative loop of the general market structure-population dynamics and system stability framework is linked to irresponsible market pricing is pointed out while indicating the main implications associated with it. And finally, some food for thoughts and relevant conclusions are provided.

Terminology

M = Market structure dynamics T = Population dynamics

R = System stability MP = Market price

C = Consumption P = Production

OVS = Overshoot NOVS = No overshoot

A = Dominant / active component a = Dominated / passive component

M-R framework T-R framework

M-T-R framework TM = Traditional market price

RMP = Responsible market price RC = Responsible consumption

RP = Responsible production RT = Responsible population

RR = Responsible system stability IMP = Irresponsible market price

IC = Irresponsible consumption IP = Irresponsible production

IT = Irresponsible population IR = Irresponsible system stability

RMP-RT-RR responsible framework IMP-IT-IR irresponsible framework

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Operational concepts and merging rules

<u>i) Operational concepts</u>

1) Responsible market price, a *price that reflects all the cost of production*

2) Irresponsible market price, *a price that does not reflect all the cost of production*

3) Responsible population behavior, *one that lives under the carrying capacity of the system so it does not overshoot*

4) Irresponsible population behavior, *one that goes over the carrying capacity of the system so it overshoots.*

5) Responsible production, *the one driven by a responsible market price*

6) Irresponsible production, *the one led by an irresponsible market price*

7) Responsible consumption, *the one driven by a responsible market price*

8) Irresponsible consumption, *the one led by an irresponsible market price*

9) Right market price, *a responsible market price*

10) Distorted market price, *an irresponsible market price*

ii) Merging rules

a) The case of frameworks

Let's assume we have a stability system with 4 components A, B. C and D and 4 different frameworks: F1 = A-D, F2 = B-D, F3 = C-D, and F4 = A-B-D, where D is the stability issue and the other components are the root causes and/or consequences, then the following merging rules hold:

1) F1-F2 = (A-D)(B-D) = A-B-D as DD = D

2) F1-F3 = (A-D)(C-D) = A-C-D as DD = D

3) F2-F3 = (B-D)(C-D) = B-C-D as DD = D

4) F1.F4 = (A-D)(A-B-D) = A-B-D as AA = A and DD = D

5) F2-F4 = (B-D)(A-B-D) = A-B-D as BB = B and DD = D

6) F3.F4 = (C-D)(A-B-D) = A-B-C-D since DD = D

b) The case of dominant component based systems

Let's assume we have a development model with 3 components A, B. and C; and we have 4 possible dominant component based models: M1 = A, M2 = B, M3 = C, and M4 = BC, then the following merging rules hold:

1) M1.M2 = (A)(B) = AB

2) M1.M3 = (A)(C) = AC

3) M1.M4 = (A)(BC) = ABC

4) M2.M3 = (B)(C) = BC

5) M2.M4 = (B)(BC) = BC

c) The case of dominant and dominated component based systems

Let's assume we have a development model with 3 components A, B. and C; and we have 4 possible dominant and dominated components based models: M1 = Abc, M2 = aBc, M3 = abC, and M4 = aBC, then the following merging rules hold:

1) M1.M2 = (Abc)(aBc) = ABc

2) M1.M3 = (Abc)(abC) = AbC

3) M1.M4 = (Abc)(aBC) = ABC

4) M2.M3 = (aBc)(abC) = aBC

5) M2.M4 = (aBb)(aBC) = aBC

The responsible market structure, responsible population dynamics and responsible system stability framework(RMP-RT-RR framework)

A market price(MP) that is consistent with the positive loop in Figure 2 in the introduction above in the sense of generating a positive system stability impact on consumption and production and shaping then the positive stability impact on population dynamics is the responsible market price(RMP), the price that includes all costs associated with production. So if we make MP = RMP, then the responsible market price-responsible population dynamics and responsible system stability framework is created as shown in Figure 4 below:

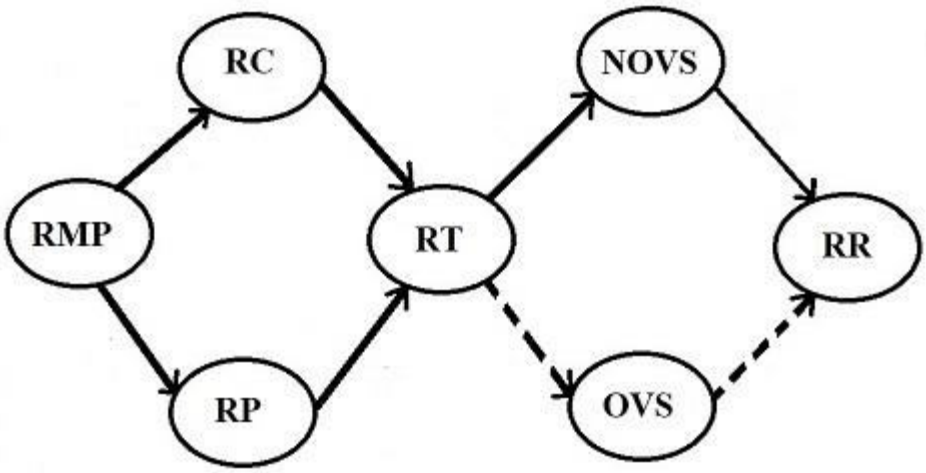

Figure 4 The general responsible market structure, responsible population dynamics and responsible system stability framework(RM-RT-RR framework)

The following can be stated based on Figure 4 above: i) the root cause of responsible system stability(RR) is the responsible market price(RMP); ii) the responsible market price(RMP) leads to responsible consumption(RC) and responsible production(RP), which shape responsible populations(RT); and iii) Responsible populations(RT) have responsible impacts on system stability(RR) as they do not overshoot(NOVS).

Implications

There is a responsible link between market prices and system stability through responsible populations. And understanding this responsible link can be relevant when addressing system stability issues like global warming.

The irresponsible market structure, irresponsible population dynamics and irresponsible system stability framework(IMP-IT-IR framework)

A market price(MP) that is consistent with the negative loop in Figure 3 in the introduction above in the sense of generating a negative system stability impact on consumption and production and shaping then the negative stability impact on population dynamics is the irresponsible market price(IMP), the price that does not include all costs associated with production. So if we make MP = IMP, then the irresponsible market price-irresponsible population dynamics and irresponsible system stability framework is formed as summarized in Figure 5 below:

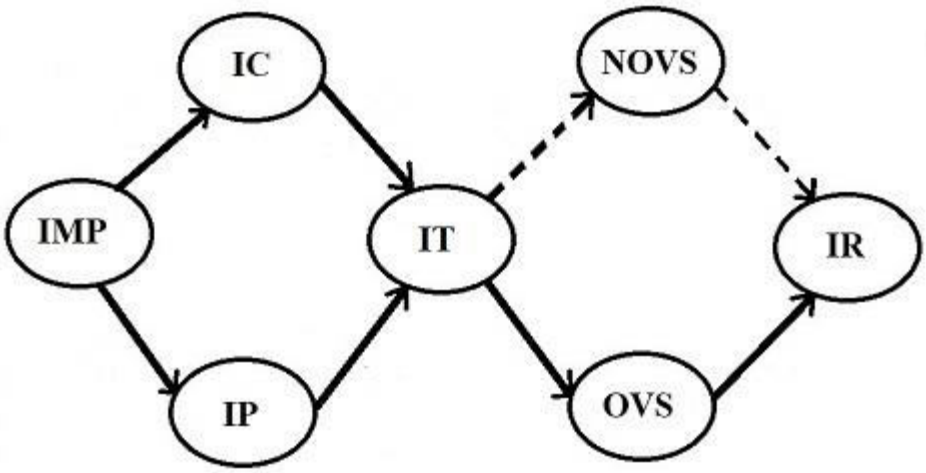

Figure 5 The general irresponsible market structure, irresponsible population dynamics and irresponsible system stability framework(IMP-IT-IR framework)

We can highlight the following based on Figure 5 above: i) the root cause of irresponsible system stability(IR) is the irresponsible market price(IMP); ii) the irresponsible market price(IMP) leads to irresponsible consumption(IC) and irresponsible production(IP), which shape irresponsible populations(IT); and iii) Irresponsible populations(IT) have irresponsible impacts on system stability(IR) as they overshoot(OVS).

Implications

There is an irresponsible link between market prices and system stability through irresponsible populations. And again understanding this irresponsible link can be relevant when addressing system stability issues like global warming.

Food for thoughts

a) Can you have responsible consumption and production with an irresponsible market price? I think No, what do you think?; b) Can you have irresponsible system stability impacts with a responsible market price? I think No, what do you think?; and c) Do market irresponsibility go hand in hand with cost externalization dynamics? I think Yes, what do you think?

Conclusions

First, it was shown by means of the responsible market structure-responsible population dynamics and responsible system stability framework that there is a responsible link between market prices and system stability through responsible population dynamics. Second, it was

stressed by means of the irresponsible market structure-irresponsible population dynamics and irresponsible system stability framework that there is an irresponsible link between market prices and system stability through irresponsible population dynamics. And finally, it was indicated that understanding responsible and irresponsible links are key when addressing system stability issues like global warming.

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