Sustainability thought 157: How to link the general market structure-population dynamics-system stability framework to the concepts of right market pricing and wrong market pricing?

By

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Abstract

The general market structure-population dynamics-system stability framework tells us that the nature of the market price determines the nature of the impact on system stability that consumption and production dynamics and population dynamics can have, via no overshoot or via overshoot. As the nature of the market price can be positive or negative in terms of system stability impacts depending on whether or not all cost associated with the business activity are reflected in the pricing mechanism, then positive impacts can be associated with right market pricing where all cost associated with economic activity are accounted for, and negative impacts can be linked to wrong market pricing as not all cost associated with business activity are accounted for as some costs are assumed away or assumed irrelevant. In other words, right market pricing leads to positive system stability impacts dynamics in terms of consumption and production dynamics and population dynamics while wrong market pricing encourage negative system stability impacts in terms of production and consumption dynamics and population dynamics. And this raises relevant questions like How to link the general market structure-population dynamics-system stability framework to the concepts of right market pricing and wrong market pricing? What are the main implications of doing this? Among the goals of this paper is to provide answers to the questions listed above.

Key words

Market structure, market price, production, consumption, population dynamics, overshoot, no overshoot, system stability, climate change, responsible behavior, irresponsible behavior, right market price, wrong market price, right consumption, wrong consumption, right production, wrong production, right population, wrong population, right system stability impact, wrong system stability impact

Introduction

a) The general M-T-R framework

It has been pointed out recently that one way of looking at system stability issues like climate change or environmental problems in general is by means of the general market structure-population dynamics and system stability framework(M-T-R framework)(Muñoz 2022), as shown in Figure 1 below:

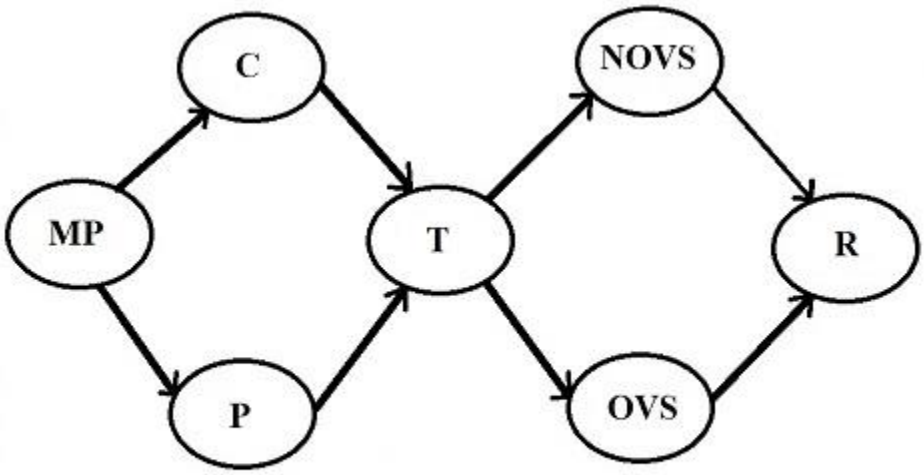

Figure 1 The general market structure, population dynamics, and system stability framework (M-T-R framework)

The following aspects can be highlighted based on Figure 1 above about the general system stability framework: i) market pricing(MP) is the root cause of impacts on system stability R, be it they positive or negative; ii) The nature of population dynamics(T) is the consequence of the nature of market price dynamics; iii) overshooting behavior(OVS) is associated only with irresponsible population behavior driven by irresponsible market structure dynamics; and iv) No overshooting behavior(NOVS) is linked to responsible population behavior led by responsible market structure dynamics. Notice that the structure in Figure 1 above then points out the systematic nature of system stability issues R such as climate change, requiring a systematic policy response whether it is to promote system stability friendly market and population policies or to discourage system stability unfriendly trends.

b) The general M-T-R framework and the right market pricing and wrong market pricing idea

The general market structure-population dynamics-system stability framework in Figure 1 above tells us that the nature of the market price determines the nature of the impact on system stability that consumption and production dynamics and population dynamics can have, via no overshoot or via overshoot. As the nature of the market price can be positive or negative in terms of system stability impacts depending on whether or not all cost associated with the

business activity are reflected in the pricing mechanism, then positive impacts can be associated with right market pricing where all cost associated with economic activity are accounted for, and negative impacts can be linked to wrong market pricing as not all cost associated with business activity are accounted for as some costs are assumed away or assumed irrelevant. In other words, right market pricing leads to positive system stability impacts dynamics in terms of consumption and production dynamics and population dynamics while wrong market pricing encourage negative system stability impacts in terms of production and consumption dynamics and population dynamics. The idea of need for more socially and environmentally friendly markets championed by the Brundtland Commission in 1987(WCED 1987) and the idea of only environmentally friendly markets promoted by the United Nations Commission on Sustainable Development in 2012 Rio +20(UNCSD 2012a; UNCSD 2012b) are consistent with the idea of the need of market prices of positive nature like the right market pricing. It has been highlighted that full accounting of costs leads to responsible market activity as there is no cost externalization(Muñoz 2020) and that not accounting for some costs by assuming them away through externality cost neutrality assumptions like Adam Smith's traditional market did/does(Smith 1776) leads to distorted market prices(Muñoz 2010) and backward economic thinking(Muñoz 2012).

c) The need to link the general system stability framework with right market pricing and wrong market pricing thinking

Hence, the discussion above raises relevant questions like How to link the general market structure-population dynamics-system stability framework to the concepts of right market pricing and wrong market pricing? What are the main implications of doing this? Among the goals of this paper is to provide answers to the questions listed above.

Goals of this paper

a) To highlight the structure of the right market structure-right population dynamics-right system stability framework and link it to optimal pricing thinking; and b) To stress the structure of the wrong market structure-wrong population dynamics-wrong system stability framework and link it to non-optimal pricing thinking.

Methodology

First, the terminology, some operational concepts and merging rules are shared. Second, the right market structure, the right population dynamics, and the right system stability framework is extracted from the general market structure-population dynamics and system stability framework. Third, the right market structure, the right population dynamics, and the

right system stability framework is linked to optimal pricing thinking. Fourth, The wrong market structure, the wrong population dynamics, and the wrong system stability framework is derived from the general market structure-population dynamics and system stability framework. Fifth, The wrong market structure, the wrong population dynamics, and the wrong system stability framework is linked to the worse system stability framework. Sixth, the worse system stability framework is linked to the overpopulation and system stability framework a la ecological overshoot. 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

RTMP = Right market price OMP = Optimal market price

WMP = Wrong market price WOMP = Worse market price

RTC = Right consumption WC = Wrong consumption

WOC = Worse consumption RTP = Right production

WP = Wrong production WOP = Worse production

RTT = Right population dynamics WT = Wrong population dynamics

WOT = Worse population dynamics RTR = Right system stability

WR = Wrong system stability WOR = Worse system stability

EP = Environmental problems OVC = Overconsumption

OVP = Over production OVT = Over population

RTM-RTT-RTR framework OM-OT-OR framework

WM-WT-WR framework WOM-WOT-WOR framework

OVT-R = Overpopulation and system stability a la ecological overshoot framework

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Operational concepts and merging rules

i) Operational concepts

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*

11) Wrong market price, *a distorted market price*

12) Right production, *a responsible production level*

13) Wrong production, *an irresponsible production level*

14) Right consumption, *a responsible consumption level*

15) Wrong consumption, *an irresponsible consumption level*

16) Right population, *a responsible population*

17) Wrong population, *an irresponsible population*

18) Right system stability impact, *a responsible stability impact*

19) Wrong system stability impact, *an irresponsible stability impact*

20) Optimal price, *a right market price*

21) Non-optimal market price, *a wrong market price*

22)Best market price, *an optimal market price*

23)Worse market price, *the worse wrong 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 right market structure, the right population dynamics, and the right system stability framework

If the nature of the market price MP in Figure 1 of the introduction is that of right market price RTMP, a price that reflects all costs associated with the business activity, then the general framework in Figure 1 above becomes the right market structure, right population dynamics, and right system stability framework(RTM-RTT-RTR framework) as there is no overshoot(NOVS) as indicated in Figure 2 below:

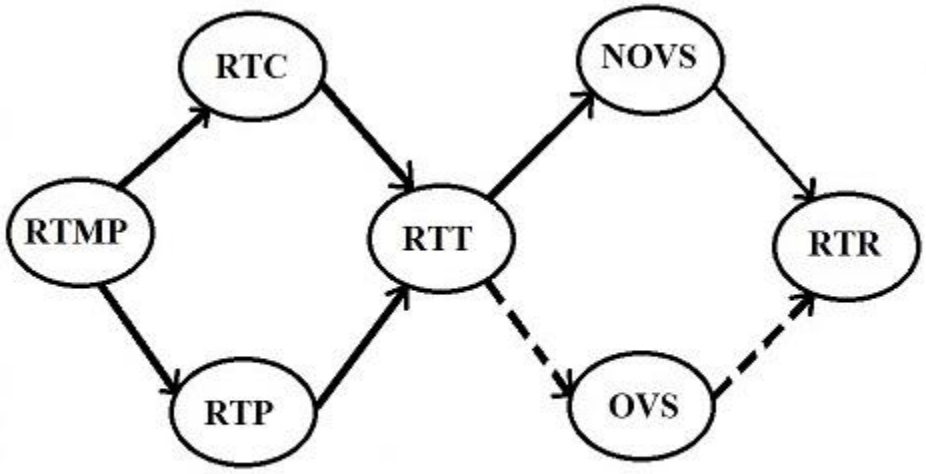

Figure 2 The right market structure, the right population dynamics, and the right system stability framework (RTM-RTT-RTR framework)

Noticed in Figure 2 above that the right market price RTMP has a positive system stability impact on consumption, production, and population dynamics, which leads to no overshooting behavior; and therefore, to right system stability. You can see that in the right

system stability framework the root cause of positive system stability impacts RTR is the right market price RTMP while right consumption RTC, right production RTP, and right population dynamics RTT are consequences of the positive stability impact exerted by the right market price RTMP. Moreover, you can see based on Figure 2 above that the right nature of the market structure(RTMP, RTC, RTP) shapes the right nature of population dynamics(RTT).

Expectation 1:

If there is right market pricing there will be right system stability conditions as there will be no overshooting behavior

Linking the right market structure, the right population dynamics, and the right system stability framework to full optimality based system stability framework

If the nature of the right market price RTMP in Figure 2 above is that of the full optimal market price OMP, a price that reflects all costs associated with the business activity, then the framework in Figure 2 becomes the optimal market structure, optimal population dynamics, and optimal system stability framework(OM-OT-OR framework) again as there is no overshooting(NOVS) as shown in Figure 3 below:

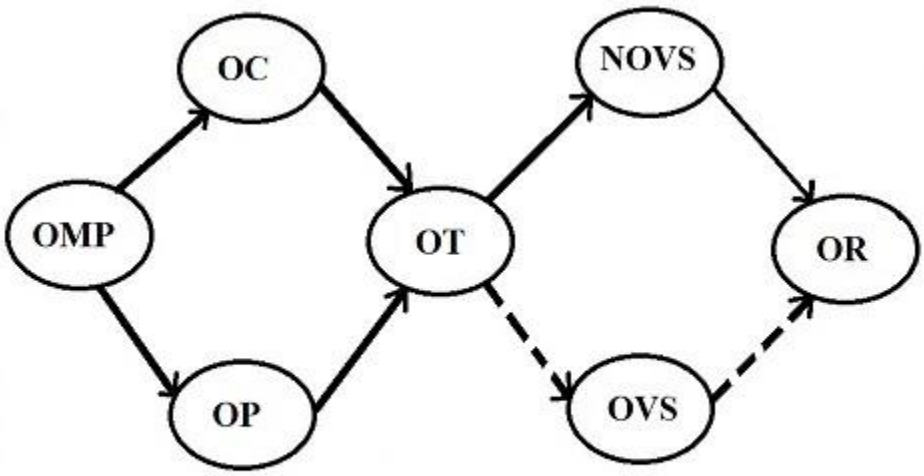

Figure 3 The optimal market structure, the optimal population dynamics, and the optimal system stability framework(OM-OT-OR framework)

Noticed in Figure 3 above that the optimal market price OMP has an optimal system stability impact on consumption, production, and population dynamics, which leads to no overshooting behavior; and hence, to optimal system stability OR as indicated by the continuous arrow from NOVS to OR. You can see that in the optimal system stability framework the root cause of optimal system stability impacts OR is the optimal market price OMP while optimal

consumption OC, optimal production OP, and optimal population dynamics OT are consequences of the optimal stability impact exerted by the optimal market price OMP. Moreover, you can see based on Figure 3 above that the optimal nature of the market structure(OMP, OC, OP) shapes the optimal nature of population dynamics(OT).

Expectation 2:

If there is optimal market pricing there will be optimal system stability conditions as there will be no overshooting behavior.

The wrong market structure, the wrong population dynamics, and the wrong system stability framework

If the nature of the market price MP in Figure 1 of the introduction is that of wrong market price WMP, a price that does not reflect all costs associated with the business activity, then the general framework in Figure 1 above becomes the wrong market structure, wrong population dynamics, and wrong system stability framework(WM-WT-WR framework) since there is overshoot(OVS) as summarized in Figure 4 below:

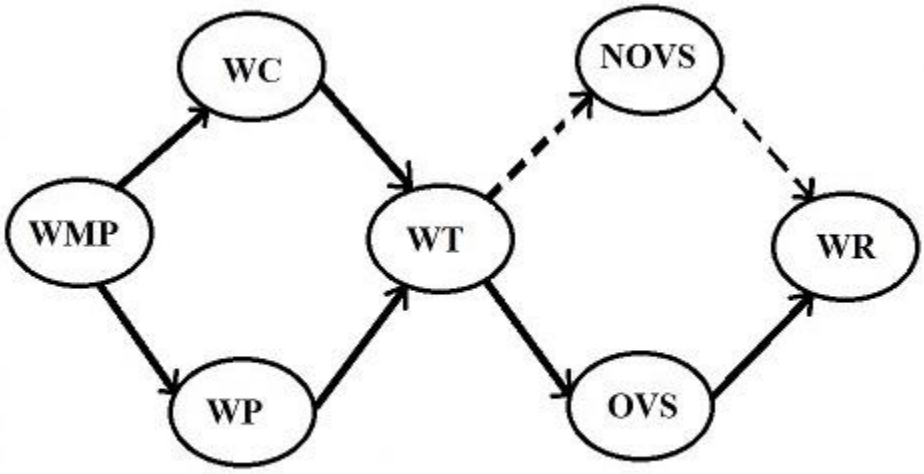

Figure 4 The wrong market structure, wrong population dynamics, and wrong system stability framework (WM-WT-WR framework)

We can see based on Figure 4 above that the wrong market price WMP has a negative system stability impact on consumption, production, and population dynamics, which leads to overshooting behavior; and hence, to wrong system stability conditions as indicated by the continuous arrow from OVS to WR. You appreciate that in the wrong system stability framework the root cause of negative system stability impacts WR is the wrong market price WMP while wrong consumption WC, wrong production WP, and wrong population dynamics WT are consequences of the negative stability impact exerted by the wrong market price WMP.

Moreover, you can see based on Figure 4 above that the wrong nature of the market structure(WMP, WC, WP) shapes the wrong nature of population dynamics(WT).

Expectation 3:

If there is wrong market pricing there will be wrong system stability conditions as there will be overshooting behavior.

Linking the wrong market structure, the wrong population dynamics, and the wrong system stability framework to the worse market price possible framework

If the nature of the wrong market price WMP in Figure 4 above is that of the worse market price WOMP, the wrong price that maximizes cost externalization, then the framework in Figure 4 above becomes the worse market structure, the worse population dynamics, and the worse system stability framework(WOM-WOT-WOR framework) since there is extreme overshoot(EOVS) as stated in Figure 5 below:

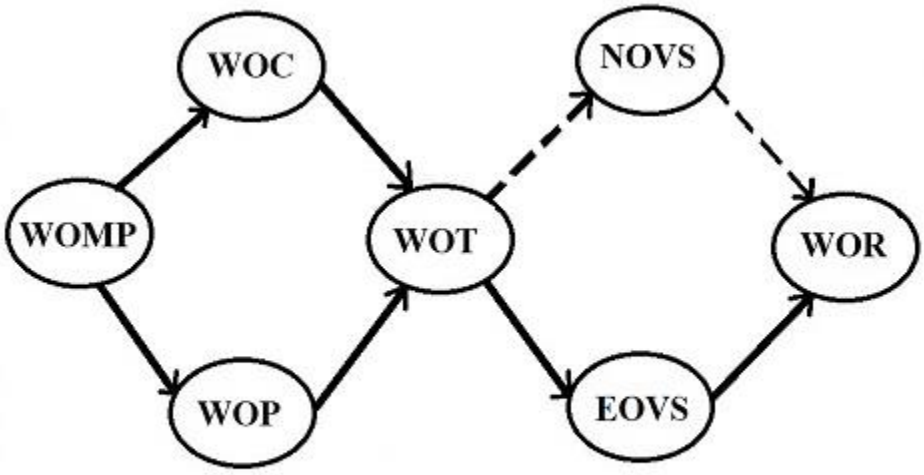

Figure 5 The worse market structure, worse population dynamics, and worse system stability framwork (WOM-WOT-WOR framework)

We can see in Figure 5 above that the worse market price WOMP has the worse system stability impact on consumption, production, and population dynamics, which leads to extreme overshooting behavior; and hence, to the worse system stability conditions WOR as indicated by the continuous arrow from OVS to WOR. You can appreciate now that in the worse system stability framework the root cause of the worse system stability impacts WOR is the worse market price WOMP while the worse consumption WC, the worse production WP, and the worse population dynamics WOT are consequences of the worse stability impact exerted by the worse market price WOMP. Moreover, you can also notice based on Figure 5 above that the worse

nature of the market structure(WOMP, WOC, WOP) shapes the worse nature of population dynamics(WOT).

Expectation 4:

If the worse market price among the wrong market prices possible is in place the worse system stability conditions will come to exist as there will be extreme overshooting behavior.

Linking the worse market price possible framework to the overpopulation and system stability framework a la ecological overshoot

Since the ecological overshoot idea(EOVS) is based on overpopulation(OVT) driving environmental problems(EP)(Rees 2022); and we know that the worse consumption(WC) and production(WP) patterns are overconsumption(OVC) and over production(OVP), which means that the worse market price possible WOMP will encourage in the long term over consumption(OVC) and over production(OVP). So if we make WC = OVC, WP = OVP, WT = OVT, EOVS = EOVS, and WR = EP in Figure 5 above, we arrived at the framework in Figure 6 below:

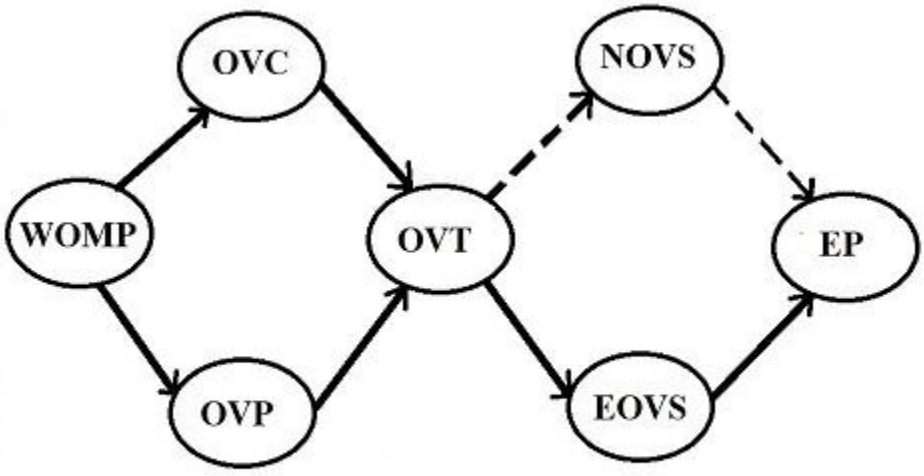

Figure 6 Linking the worse market price structure to over population dynamics and environmental problems a la ecological overshoot

Figure 6 above provides a link between market structure dynamics and the ecological overshoot idea, where the right side from OVT to EP is the overpopulation and environmental problems a la ecological overshoot idea; and the left part from WOMP to OVT is the worse market structure idea that leads to worse population dynamics a la overpopulation. Notice that in the worse system stability framework as in Figure 6 above, the root cause of environmental problems EP is the worse market price WOMP as the worse market structure possible(WOMP, OVC, OVP) leads population dynamics towards overpopulation(OVT) and to extreme

overshoot(EOVS). Now if we assume that market structures, right or wrong, do not matter, then the ecological overshoot idea holds, where the root cause of environmental problems would be then overpopulation dynamics.

Expectation 5:

If the worse market price among the wrong market prices possible is in place the worse system stability conditions will come to exist as in the long term overpopulation dynamics will materialize as the worse population dynamics possible, which will lead to environmental problems through extreme overshooting behavior.

Food for thoughts

a) Should we expect overshooting under right market pricing? I think No, what do you think?; b) Should we expect no overshooting behavior under wrong market pricing? I think No, what do you think?; and c) Can a system stability issue be solved without fixing the root cause? I think No, what do you think?

Conclusions

First, it was indicated that if there is right market pricing, then the general M-T-R framework becomes the right system stability framework(RTM-RTT-RTR), where the root cause of right system stability conditions is the right market price. Second, it was stressed that if the right market pricing was the full optimal pricing idea, then the right RTM-RTT-RTR framework becomes the optimal system stability framework(OM-OT-OR), where the root cause of optimal system stability conditions is the optimal market price. Third, it was highlighted that if there is wrong market pricing, then the general M-T-R framework becomes the wrong system stability framework(WM-WT-WR), where the root cause of wrong system stability conditions is the wrong market price. Fourth, it was pointed out that if the is wrong market pricing was the worse market price possible idea, then the wrong WM-WT-WR framework becomes the worse system stability framework (WOM-WOT-WOR), where the root cause of the worse system stability conditions is the worse market price. Fifth, it was mentioned that we can link the worse system stability framework with the ecological overshoot idea if we link worse consumption to overconsumption, worse production to over production, worse population dynamics to over population dynamics, overshoot to extreme overshoot and worse system stability to environmental problems. And sixth, it was stated that if market structure matters, then the nature of the population dynamics is shaped by the nature of the market price structure, but if markets do not matter then the ecological overshoot idea holds as then overpopulation dynamics are the root cause of environmental problems.

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