Sustainability thoughts 154: How does a general perfect red market paradigm evolution model is expected to work? The cases of expanding red markets, of saving red markets from collapse, and of the fall of red markets due to binding environmental externality pressures

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Abstract

If we place a general perfect market evolution model under externality neutrality assumptions, we can extract the environment under which a dominant component perfect markets operate, which allows for the possibility of forever growth and no collapse. However, if we place it under a framework of no externality neutrality assumption, then the model shows limits to growth and the possibility of collapse. And if the risk of collapse is real, the dominant component market model can either be saved or it can collapse if it cannot be saved. The saving mechanism allows for either a full fix or just a patch, but it all depends on whether or not there are paradigm shift knowledge gaps as well as political and academic will. If the market cannot be saved, it will flipped perfectly or imperfectly to opposite and inverse opposite forms, and if possible they will flip towards a market form that still allow them to keep at least some of the core values they had before the flip. The above holds true for any dominant component based market, and this paper focus its attention on the perfect red market model or perfect socially friendly capitalism, which makes the following questions relevant: How does a general perfect red market paradigm evolution model is expected to work? The cases of expanding red markets, of saving red markets from collapse, and the case of the fall of red markets due to binding environmental sustainability pressures.

Key concepts

Perfect markets, imperfect markets, perfect red markets, imperfect red markets, externality neutrality assumption, binding environmental sustainability gaps, paradigm evolution,

dominant paradigm, market expansion, market collapse, fully fixing markets, partially fixing markets, paradigm shift, paradigm flip, perfect paradigm shift, perfect paradigm flip, imperfect paradigm shift, imperfect paradigm flip

Introduction

1) The general perfect market evolutions model

If we have a dominant component based perfect market of the form $M = X_y$, where X is the dominant component driving the market; and "y" is the passive component, then all possible evolutions routes if under externality pressures available to this market M can be summarized as previously indicated(Muñoz 2021) as it is done in Figure 1 below:

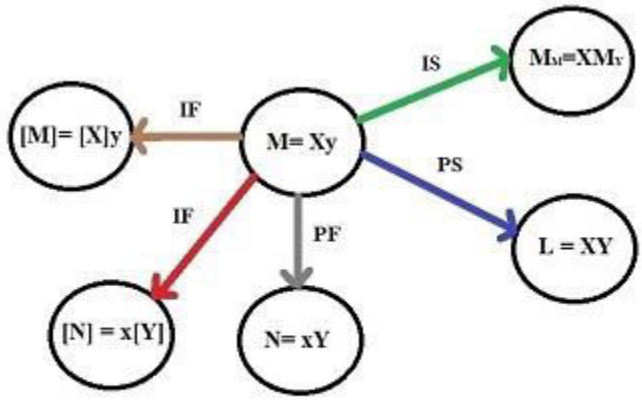

Figure 1 Paradigm M under all types of pressures provides the structure of the general paradigm evolution model under sustainability gap pressures pressures(SGv)

We can appreciate the following based on Figure 1 above about the perfect model M = Xy: i) Model M is the dominant component X perfect market; ii) Model L is a two dominant component based market; iii) Model M_M is the externality "y" based externality management market; iv) Model N is the perfect inverse opposite market to M, a dominant component Y perfect market; v) Model [N] is a dominant component Y based dictatorship market, and the imperfect inverse opposite model to M; and vi) Model [M] is a dominant component X based dictatorship market and the opposite model to M.

Therefore, Figure 1 above summarizes all possible paradigm evolution routes for all possible dominant component based perfect markets. In other words, the paradigm evolution routes for perfect market M in Figure 1 above hold for any dominant component based perfect market such as the perfect social market or the perfect economic market or the perfect green market or the perfect red market, and so on. It is well-known that the traditional market model given to the world by Adam Smith(Smith 1776) has a dominant economy structure consistent with the perfect structure in Figure 1 above under equality neutrality assumptions.

2) The structure of the perfect red market model

A market where the society(A) and the economy(B) are the dominant components at the same time and where the environment(c) is a passive component is known as the perfect red market(RM)(Muñoz 2016), which can be stated analytically as follows:

RM = ABc

Hence a perfect red market(RM) or perfect socially friendly capitalism is the market where there is socio-economic(AC) growth or red growth without producing environmental externalities(c).

3) Transforming the general perfect market evolution model in Figure 1 above into a general perfect red market evolution model

If we make the perfect red market RM = ABc equal to the perfect market M = Xy in Figure 1 above, then RM = M and AB = X and y = c. With this information we can find the corresponding market structures of the perfect red market under environmental sustainability pressures consistent with all those structures in Figure 1 above as shown in the Table below:

Table 1

General market structures	Corresponding market structure	Name of market structure
M = Xy	**M = ABc = RM**	**The perfect red market**
L = XY	**L = ABC = S**	**The perfect sustainability market**
$M_M = XM_Y$	**$M_M = ABM_C = RM_M$**	**Red market under externality management**
N = xY	**N = abC = ENM**	**The perfect environmental market**
[N] = x[Y]	**[N] = ab[C] = [ENM]**	**The imperfect environmental market**

[M] =[X]y **[M] = [AB]c = [RM]** **Red market under dictatorship**

Notice that here B = dominant economy, C = dominant environment, A = Dominant society, b = passive economy, c = passive environment, and a = passive society, where passive components can be externalities and dominant components are drivers of growth. Also notice for example that the red market is a two dominant component based perfect model(RM = ABc) and that the perfect environmental market is a one dominant component based perfect model(ENM = abC).

The structure of the general red market paradigm evolution model under environmental sustainability gap pressures can be put together using the information obtained in Table 1 above as indicated in Figure 2 below:

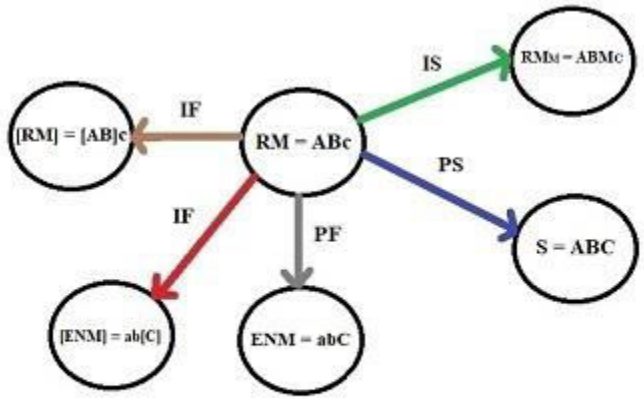

Figure 2 The perfect red market(RM) under all types of pressures provides the structure of the general perfect red market paradigm evolution model under environmental sustainability gap pressures(SGc)

We can say the following based on Figure 2 above about the perfect red market model RM = ABc: i) The red market model(RM = ABc) at the center is a two dominant component(AB) perfect market as both the society(A) and the economy(B) are in dominant form at the same time; ii) The perfect sustainability market model(S = ABC) is a three dominant component based perfect market as all, the economy(B), the environment(C) and the society(A) are in dominant form at the same time; iii) The red market model under environmental externality management($RM_M = ABM_C$) is the environmental externality management based imperfect market; iv) The perfect environmental market(ENM = abC) is the perfect inverse opposite market to the red market RM, an environment dominant component C perfect market; v) The imperfect environmental market model([ENM] = ab[C]) is an environment dominant component [C] based environmental dictatorship market and the imperfect inverse opposite model to the red market RM; and vi) The imperfect red market model ([RM] = [AB]c) is a two

dominant component AB based red dictatorship market and the opposite model to the red market(RM). Notice that in this type of thinking even the existence of authoritarian based markets is consistent with paradigm flip theory under environmental externality pressures.

Hence, Figure 2 above summarizes all possible paradigm evolution routes available to perfect green markets when under social sustainability gap pressures.

4) The need to understand how the general perfect red market evolution model is expected to work when under environmental externality neutrality assumptions and when under binding environmental externality assumptions

As shown above, if we transform a general perfect market evolution model under externality neutrality assumptions in Figure 1 into a general perfect red market evolution model as in Figure 2, we can extract the environment under which perfect red markets operate, which allows for the possibility of forever growth and no collapse. However, if we place this perfect red market under a framework of no externality neutrality assumption, then the red market model shows limits to growth and the possibility of collapse. And if the risk of collapse is real, the two dominant component based perfect red market model can either be saved or it can collapse if it cannot be saved. The saving mechanism allows for either a full environmental fix or just an environmental patch, but it all depends on whether or not there are environmental externality market based and sustainability market based paradigm shift knowledge gaps together with political will and academic will. The key role that paradigm shift knowledge gaps have in either supporting efforts to save a paradigm from collapse or in leading to its collapse have been recently pointed out(Muñoz 2020). The world of red markets just as the world of green markets(UNCSD 2012a; UNCSD 2012b) is an approach beyond economic thinking as usual as suggested to us by the Brundtland Commission(WCED 1987) as it deals with socio-economic development under environmental constraints.

If the perfect red market cannot be saved because there are environmental externality management based and sustainability market based paradigm shift knowledge gaps at the same time, then it will flip perfectly or imperfectly to opposite or inverse opposite forms, and if possible it will flip towards a market form that still allows it to keep at least some of the core values it had before the flip. The discussion above makes the following question relevant: How does a general perfect red market paradigm evolution model is expected to work? The cases of expanding red markets, of saving red markets from collapse, and the case of the fall of red markets due to binding environmental sustainability pressures. Among the goals of this paper is to provide a detailed answer, both analytically and graphically, to this question.

Goals of this paper

a) To point out how the perfect red market model RM is expected to work under environmental externality neutrality assumptions; b) To indicate how the perfect red market model RM under binding environmental externality assumptions can be saved from collapse by a full environmental fix or by an environmental patch; and c) To highlight how the perfect red market model RM under binding environmental externality assumptions will evolve if it cannot be saved and collapses.

Methodology

First, the terminology used in this paper is introduced. Second, the operational concepts and typology of paradigms and paradigm evolution rules are shared. Third, the structure of the perfect red market model RM when under unlimited growth is pointed out, analytically and graphically. Fourth, the structure of the perfect red market model RM when under full environmental fix and under partial environmental fix or saving options is highlighted, analytically and graphically. Fifth, the structure of the perfect red market model RM when it collapses as it cannot be fixed is shared analytically and graphically to point out available evolution routes. And finally sixth, some food for thoughts and relevant conclusions are provided.

Terminology

M1 = Perfect market M1 [M1] = Imperfect market M

[M1] = Authoritarian market M1 $M1_M$ = M1 under externality management

PS = Perfect shift IS = Imperfect shift

PF = Perfect paradigm flip IF = Imperfect paradigm flip

M = Perfect lower level market M N = Perfect lower level market N

L = Perfect higher level market L [ ] = Authoritarianism

[M] = Market M under authoritarianism [N] = Market N under authoritarianism

RM = Perfect red market [RM] = Red market under dictatorship

RM_M = Red market under externality management ENM = Perfect environmental market

[ENM] = Imperfect environmental market S = Perfect sustainability market

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Operational concepts, types of market structures and model evolution rules

a) Operational concepts

1) Perfect market, *a market where there is dominant component equality and freedom*

2) Imperfect market, *a market where there is component equality, but not freedom*

3) Perfect paradigm shift, *a shift from a perfect market to a higher level perfect market*

4) Paradigm management, *the handling of cost externalization through externality management*

5) Paradigm flip, *a flip to the opposite paradigm or a flip to the inverse opposite paradigm*

6) Perfect paradigm flip, *a flip to the perfect inverse opposite paradigm or a flip to the imperfect inverse opposite paradigm*

7) Imperfect paradigm flip, *a flip to the imperfect inverse opposite paradigm or a flip to the perfect inverse opposite paradigm*

8) Authoritarian market, *an imperfect market*

9) Sustainability market, *the perfect market where there is full co-component equality and freedom*

10) Externality management market*, the market where there is partial co-component equality, but no freedom.*

b) Type of market structures

Given the dummy market models M_1= Xy and M_2= xY, the following can be said about different market structures:

1) Perfect markets

There is dominant component equality and freedom

M_1 = Xy = A dominant component X perfect market

M_2 = xY = A dominant component Y perfect market

2) Imperfect markets

There is dominant component equality, but no freedom, they are dictatorship based markets

$[M_1] = [X]y$ = A dominant component X imperfect market

$[M_2] = x[Y]$ = A dominant component Y imperfect market

3) Externality management market

They are ongoing government intervention based markets

$M_{M1} = XY_M$ = A dominant component X externality Y management market

$M_{M2} = X_MY$ = A dominant component Y externality X management market

4) The sustainability market

The perfect market where there is full co-component equality and freedom

$S = M_1.M_2 = (Xy)(xY) = XY$

Details about paradigm merging rules and paradigm shift rules can be found in the publication about paradigm evolution and sustainability thinking(Muñoz 2019).

c) Model evolution rules

i) Perfect paradigm shift

The externality gap affecting the market, y or x, is fully closed and internalized, in perfect markets and imperfect markets

PS

$M_1 = Xy$----------→ $M_3 = XY$

PS

$M_2 = xY$----------→ $M_3 = XY$

PS

$[M_2] = x[Y]$----------→ $[M_3] = [XY]$

ii) Imperfect paradigm shift

The externality gap affecting the market, y or x, is patched and managed as an externality problem, in perfect markets and imperfect markets

IS

M_1 = Xy----------→ M_4 = XM_Y

IS

M_2 = xY----------→ M_5 = M_XY

IS

[M_2] = x[Y]----------→ [M_5] = [M_XY]

iii) Perfect paradigm flip

Paradigms flip to the perfect inverse opposite model, in perfect markets and in imperfect markets

PF

M_1 = Xy----------→ M_2 = Xy

PF

M_2 = xY----------→ M_1 = Xy

PF

[M_2] = x[Y]----------→ [M_1] = [X]y

iv) Imperfect paradigm flip

Paradigms flip to the imperfect inverse opposite model, in perfect markets and in imperfect markets

IF

M_1 = Xy----------→ M_6 = x[Y]

IF

M_2 = xY----------→ M_7 = [X]y

IF

M_7 = [X]y----------→ M_2 = xY

The perfect dominant component based red market RM under externality neutrality assumptions

If the perfect red market model RM = ABc in Figure 2 above operates under environmental externality neutrality assumptions, then the pressures from the environmental externality "c" it generates when expanding are irrelevant as indicated by all the broken arrows; and therefore, there is no need to evolve as by assumption it is not under sustainability threats from environmental externality 'c', a situation that can be indicated as in Figure 3 below:

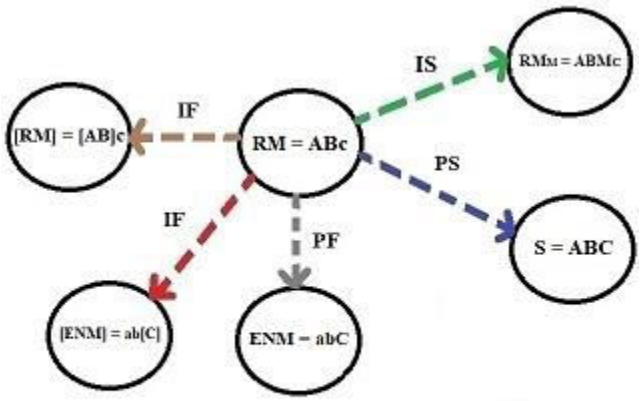

Figure 3 The perfect red market(RM) under no environmental externality 'c' pressures provides the structure of a market without limits to growth and no fear of collapse

The broken arrows in Figure 3 above indicate the idea that under environmental externality neutrality assumptions there is no need to fix the paradigm nor there is a need to flip to other paradigm forms as the paradigm cannot collapse since growth is unlimited or it has no environmental limits.

In other words, under environmental externality neutrality assumptions the perfect red model RM can expand for ever without generating environmental externalities such as 'c', which allow it to operate outside the pressures of sustainability gaps(SG_C) from passive environmental component "c" as indicated in Figure 4 below:

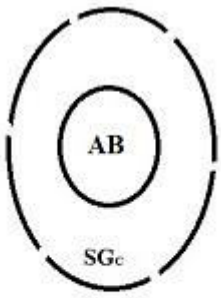

Figure 4 The perfect red market(RM) under no limits to growth as the environmental externality driven sustainability gap SGc is non-binding since RM = ABc

We can see based on Figure 4 above that without environmental sustainability gap pressures $SG_C = 0$ by assumption, the perfect red market model RM driven by dominant components AB displays unlimited growth as it could expand for ever without environmental sustainability gap's restrains. In other words a perfect market like the red market RM can expand for ever under environmental externality neutrality assumptions.

The perfect dominant component based red market model RM under binding environmental externality assumptions

When there is no environmental externality neutrality assumptions there are sustainability gap pressures($SG_C = c$) so that when environmental externalities become binding($BSG_C = c$), they place limits to the growth of the perfect red market model RM as shown in Figure 5 below:

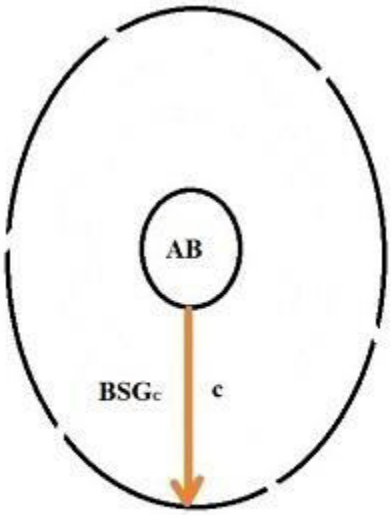

Figure 5 The perfect red market(RM) under binding environmental sustainability gap pressures BSG_C so RM = ABc

Figure 5 above points out that the environmental externality "c" can become a binding externality BSG_C capable of even forcing the collapse of the perfect red market model RM if no action is taken to save it. In other words, when the environmental externally "c" becomes a binding externality(BSG_C) it forces stakeholders to fix it, fully or partially, to save it to maintain the core values of the perfect red market RM or it forces them to accept that the perfect red market RM as it is known will collapse and flip to take the form of other paradigms with different core values. Hence, we should expect that stakeholders who support the perfect red market model RM will first try to take actions to save it; and only and only when they cannot save the perfect red market paradigm they will accept the collapse and flip options.

i) The options available to save the perfect red market model RM from collapse under binding environmental sustainability gap pressures

To avoid the collapse of the perfect red market RM under binding environmental sustainability gap pressures(BSG_C) from externality "c", we have two options: i) a full environmental fix by shifting it to the perfect sustainability model "S" where there are no longer pressures from externality 'c" and ii) a partial environmental fix by placing the perfect red market model RM under environmental externality "c" management frameworks RM_M, as it can be appreciated in Figure 6 below:

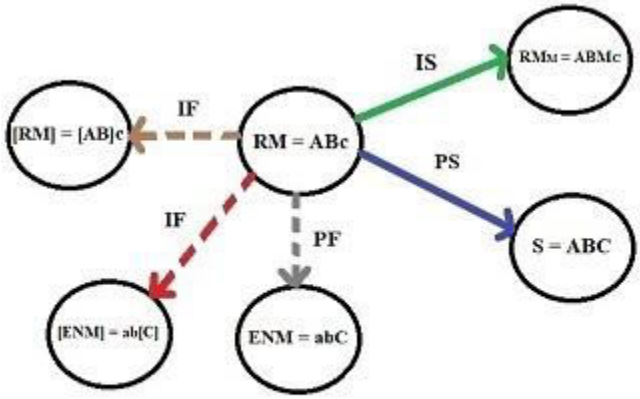

Figure 6 The perfect red market(RM) under binding environmental externality pressures and the ways to avoid collapse provides the structure of a full environmental fix and of a partial environmental fix

The continuous arrows in Figure 6 above indicate the two options available to save the red market RM from collapse; and the broken arrows indicate that if the red market paradigm can be saved there will be no collapse; and therefore, there will be no paradigm flips to opposing views paradigms. The blue arrow in Figure 6 above shows the perfect shift(PS) from the perfect red market model RM to a higher level perfect market model S or sustainability market; and the green arrow indicates the imperfect shift(IS) from the red market model RM to externality management based red market model RM_M, those shifts are addressed analytically below.

1) The perfect environmental fix option

The blue arrow in Figure 6 above shows the full environmental fix option, the perfect shift(PS) from the perfect red market RM = ABc to the perfect sustainability market S = ABC, which is achieved by internalizing the environmental externality cost of "c" in the pricing mechanism of the perfect red market RM so it perfectly shifts, a situation that can be expressed analytically as follows:

PS

RM = ABc----------→S = ABC

The expression above tells us that if "c-------→C", then the perfect red market model RM will perfectly shift(PS) to the perfect sustainability model "S" as there are no longer externality gaps associated with the cost of environmental externality "c".

2) The partial environmental fix option

The green arrow in Figure 6 above indicates the partial environmental fix option, the imperfect shift(IS) from perfect red market RM = ABc to imperfect externality management based red market $RM_M = ABM_C$], which is achieved by managing the environmental externality cost of 'c' as "M_C" so that $BSG_C = c > M_C$, which sets externally the new pricing mechanism of the imperfect environmental externality management based red market RM_M so it imperfectly shifts, a situation that can be expressed analytically as follows:

IS

RM = ABc----------→$RM_M = ABM_C$

The expression above tells us that if "c-------→M_C", then the perfect red market model RM will imperfectly shift(IS) to imperfect environmental externality management based red market model RM_M, a market where still there is a remaining environmental externality gap associated with externality "c" since $BSG_C = c > M_C$.

3) The role of paradigm shift knowledge gaps in terms of the best saving option to implement

If there are no sustainability market based paradigm shift knowledge gaps, then whether to implement a full environmental fix or a partial environmental fix to save the red market paradigm may depend on politics and academic will, not on science. If there are no sustainability market based paradigm knowledge gaps then the best solution to save the dominant perfect red market paradigm is the science based solution, which is the implementation of the full environmental market fix through full environmental externality cost internalization to induce a perfect shift. However, the science based solution may not be politically feasible so implementing a partial environmental fix through environmental externality management frameworks may be the politically feasible option as red market prices can then be kept lower. But implementing a non-science based solution when there are no sustainability market based paradigm shift knowledge gaps because it is more politically feasible requires the existence of willful academic blindness as when there are no sustainability market based paradigm shift knowledge gaps science leads to a full environmental fix, not to a partial environmental fix. If there are sustainability market paradigm shift knowledge gaps, but there are no knowledge gaps affecting the implementation of the partial environmental fix, then such a partial environmental fix to the red market may be used to gain time to close the sustainability market based paradigm shift knowledge gaps for a later transition to perfect sustainability markets. Notice that a partial environmental fix of the red market model RM in the long term may collapse as the remaining environmental externality gap affecting the environmental externality management based red

market is still active. If there were both, environmental externality management based knowledge gaps and sustainability market based knowledge gaps at the same time, then the red market cannot be fixed and it would collapse.

ii) The option of perfect red market model RM collapse when it cannot be saved from binding environmental externality pressures

If the perfect red market model RM is under binding environmental externality pressures(BSG_C) and there are sustainability market based paradigm shift knowledge gaps and there are environmental externality management market based paradigm shift knowledge gaps or the partial environmental fix fails in the long term due to growing $c > M_C$, then the perfect red market cannot be saved, and this perfect red market will collapse. And hence, if the perfect red market cannot be saved, it will flip perfectly or imperfectly to opposite or inverse opposite forms, and if possible it will flip towards a market form that still allows it to keep some of the core values they had before the flip.

When a perfect market model like the red market model RM cannot be saved it will flip as shown in Figure 7 below:

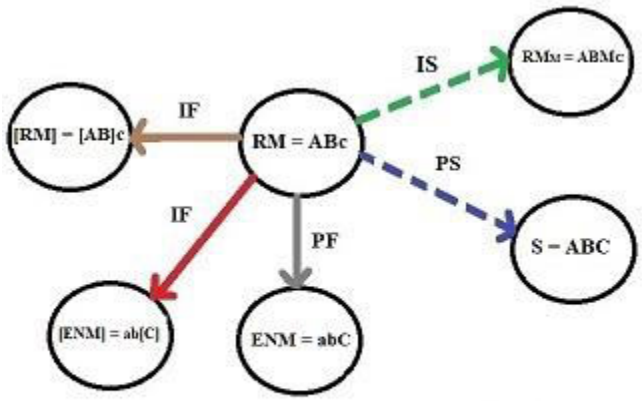

Figure 7 The perfect red market(RM) under binding environmental externality pressures when it can not be saved and collapses provides the structure of all possible paradigm flip routes

The broken arrows in Figure 7 above tell us that the perfect red market paradigm RM cannot be saved and that for this reason it has 3 paradigm evolution options: i) a perfect flip(PF) from perfect red market RM = ABc to the inverse opposite perfect environmental market ENM = abC as indicated by the gray arrow; ii) an imperfect flip(IF) from perfect red market RM to the inverse opposite imperfect environmental market [ENM] = ab[C] as indicated by the red arrow; and iii) an imperfect flip(IF) from perfect red market RM to imperfect red market [RM] = [AB]c as indicated by the brown arrow. These paradigm flips are described in detailed below:

1) The perfect flip from perfect red market RM to perfect environmental market ENM

The flip from perfect red market RM to perfect environmental market ENM as indicated by the gray arrow can be stated as follows:

PF

RM = ABc----------→ ENM = abC

Notice that when perfect dominant components "AB" go perfectly to passive components "ab" so that AB----→ab, then the perfect red market model RM flips to the perfect environmental market model ENM as then "c--------→C. It is a flip from a perfect market to the inverse opposite perfect market.

2) The imperfect flip from the perfect red market RM to perfect inverse opposite environmental market model [ENM]

The flip from perfect red market RM to imperfect inverse opposite environmental market [ENM] can be written as follows:

IF

RM = ABc----------→ [ENM] = ab[C]

Notice that when perfect dominant components "AB" go to "ab" so that AB----→ab and when c-----→[C] , then the perfect red market model RM flips to the imperfect environmental market [ENM]. It is a flip from a perfect market to the imperfect inverse opposite dominant component market or dictatorship based environmental market.

3) The imperfect flip from perfect red market RM to the opposite red market

The flip from perfect red market RM to imperfect red market [RM] can be indicated as follows:

IF

RM = ABc----------→ [RM] = [AB]c

Notice that when perfect dominant components "AB" go imperfectly to '[AB]" so that AB-----→[AB] and passive component "c" stays passive, then perfect red market model RM flips to imperfect red market model [RM]. It is a flip from a perfect market to a dictatorship based market.

4) Political and legal loyalty structures and core values and paradigm flips after collapse

After paradigm collapse, the political and legal loyalty under which perfect red market RM operated flip to the political and legal loyalty structure under which the new paradigms operate. If stakeholders, take steps long before or just before the collapse to transition towards a

preferred flip structure that allows them to keep some portion of the core values the collapsing model had before the collapse they will try to transition there. For example, a flip from red markets to either perfect or imperfect environmental markets means a total loss of their socio-economic based core values, but a flip to a red market under dictatorship still allows them to keep some of those core values so when stakeholders know that the red market is collapsing they will try or they should be expected to try to transition towards imperfect red markets or red markets under dictatorship.

Food for thoughts

a) Does the flip from perfect red markets to imperfect red markets means a flip in political and legal loyalties? I think yes, what do you think?; b) Are both, dictatorship based red markets and environmental externality management based red markets, imperfect markets? I think yes, what do you think?; and c) Is a dictatorship based red market a red market without socio-economic freedom? I think yes, what do you think?

Conclusions

1) It was indicated that under environmental externality neutrality assumptions the perfect red market model has no limits for growth; 2) It was pointed out that the perfect red market paradigm can be saved from collapse when under binding environmental externality pressures, both through a full environmental fix or a partial environmental fix; 3) It was highlighted that if there are no sustainability market based paradigm shift knowledge gaps, then the full environmental fix is the science based solution, but it may be the less politically feasible option; 4) It was stressed that implementing the non-science based solution or partial environmental fix to save the perfect red market paradigm when there are not sustainability market paradigm shift knowledge gaps because it is a more politically amenable option needs the existence of willful academic blindness; 5) It was mentioned that if the perfect red market paradigm cannot be saved because of the existence of sustainability market based paradigm shift knowledge gaps and environmental externality management market based knowledge gaps or the partial environmental fix fails, then it will collapse and flip to either the opposite model or to the perfect inverse opposite model or to the imperfect inverse opposite model; and 6) It was said that if actions are taken to transition to a preferred paradigm flip when approaching paradigm collapse in order to maintain the some portion of the core values they had before the collapse like when flipping from perfect red markets to imperfect red markets they should be expected to transition there.

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