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Sustainability thoughts 143: Pointing out the different roads towards sustainability markets when placing the traditional market model of Adam Smith under the Thomas Kuhn's paradigm transformation loop analytically and graphically

By

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Abstract

It can be said that a paradigm that has abnormalities or inconsistencies is a flawed paradigm. If we place this flawed paradigm under the Thomas Kuhn's paradigm transformation loop under academic integrity we arrive in the end, no matter the order in which the abnormalities are removed by internalization processes, to a golden paradigm, a paradigm with no abnormalities. This holds true for any flawed paradigm, including the traditional market paradigm, which we all know or should know has social and environmental abnormalities embedded in it that need to be removed to go beyond economic thinking as usual and move towards sustainability markets, the golden paradigms at the end of fully correcting traditional markets. Hence, this paper focuses on applying the Thomas Kuhn's paradigm transformation theory to the traditional market in order to remove its social and/or environmental abnormalities to transform it in the end into a sustainability market, a market without social and environmental abnormalities, and therefore, a golden market. Which raises the question, how can the different roads towards sustainability markets that come along when placing the traditional market model of Adam Smith under the Thomas Kuhn's paradigm transformation loop be pointed out analytically and graphically? One of the goals of this paper is to provide an answer to this question.

Key concepts

Scientific revolutions, status quo model, model abnormalities, paradigm crisis, paradigm death, academic consensus, paradigm shifts, academic integrity, willful academic blindness, scientific truth, academic facts, alternative academic facts, golden paradigm, flawed paradigm, new paradigms, paradigm evolution loop, social externalities, environmental externalities, externality internalization, Thomas Kuhn's evolution loop, Thomas Kuhn's transformation loop.

Introduction

a) The Thomas Kuhn's paradigm evolution loop as paradigm transformation loop

It can be said that when the Thomas Kuhn's paradigm evolution loop under academic integrity removes some abnormalities affecting flaw paradigms it transforms them into different flawed paradigms; and then the process can be repeated on the new flawed paradigms until all abnormalities are removed leading in the end to a golden paradigm(GOP). The idea of how the Thomas Kuhn's transformation loop(TKTL) based on the knowledge on paradigm evolution shared by Thomas Kuhn(Kuhn 1970) affects flawed paradigms and how it does not affect golden paradigms has been recently shared(Muñoz 2022). In other words, the Thomas Kuhn's paradigm evolution loop is in the end a paradigm transformation loop(TKTL) as it transforms flawed paradigms(FLM) in the end into golden paradigms(GOP), a situation that can be stated analytically as follows:

1) TKTL(FLM) = GOP

Where FLM = flawed paradigm, a paradigm with abnormalities

GOP = golden paradigm, a paradigm with no abnormalities

Expression 1) above simply tells us that when we place the flawed paradigm(FLM) under the Thomas Kuhn's transformation loop(TKTL) under academic integrity all abnormalities are removed transforming it into a golden paradigm(GOP).

b) The case of the flawed paradigm with "n" abnormalities and the TKTL transformation loop

If we have a flawed paradigm(FLM = M) such as the dominant component R paradigm with "n" abnormalities or inconsistencies "I", then it has the following structure:

2) FLM = M = RI1I2I3…..In

Now the Thomas Kuhn's transformation loop(TKTL) ends as follows if we remove all abnormalities I1 to In from the flawed paradigm(FLM) by abnormality internalization:

TKTL(FLM) = TKTL(M) = TKTL(RI1I2I3…..In) = R.I[I1I2I2….In] = GOP

However, step by step the Thomas Kuhn's transformation loop(TKTL) works as follows when removing one abnormality or inconsistency at a time through abnormality internalization(I[ ]):

i) When removing abnormality I1

In this case, the Thomas Kuhn's transformation loop(TKTL) works as follows:

TKTL1(FLM1) = TKTL1(M1) = FLM2 = M2= R.I[I1]I2I3….In

Notice that when abnormality I1 is internalized(I[I1]), then there is a shift from M1----→ M2.

ii) When removing abnormality I2

In this case, the Thomas Kuhn's transformation loop(TKTL) works as stated:

TKTL2(FLM2) = TKTL2(M2) = FLM3 = M3 = R.I[I1I2]I3…In

Notice that when abnormality I2 is internalized(I[I2]), then there is a shift from M2----→ M3.

iii) When removing abnormality I3

In this case, the Thomas Kuhn's transformation loop(TKTL) works as indicated:

TLTL3(FLM3) = TKTL3(M3) = FLM4 = M4 = R.I[I1I2I3]…..In

Notice that when abnormality I3 is internalized(I[I3]), then there is a shift from M3----→ M4.

iv) When removing the last abnormality In

In this case, the Thomas Kuhn's transformation loop(TKTL) works as shown below:

TKTLn(FLMn) = TKTLn(Mn) = R.I[I1I2I3….In] = GOP

Notice that when abnormality In is the last inconsistency to be internalized(I[I1I2I3…In]), then there is a shift from Mn----→ GOP.

The step by step working of the Thomas Kuhn's transformation loop described above analytically can be appreciated graphically as in Figure 1 below

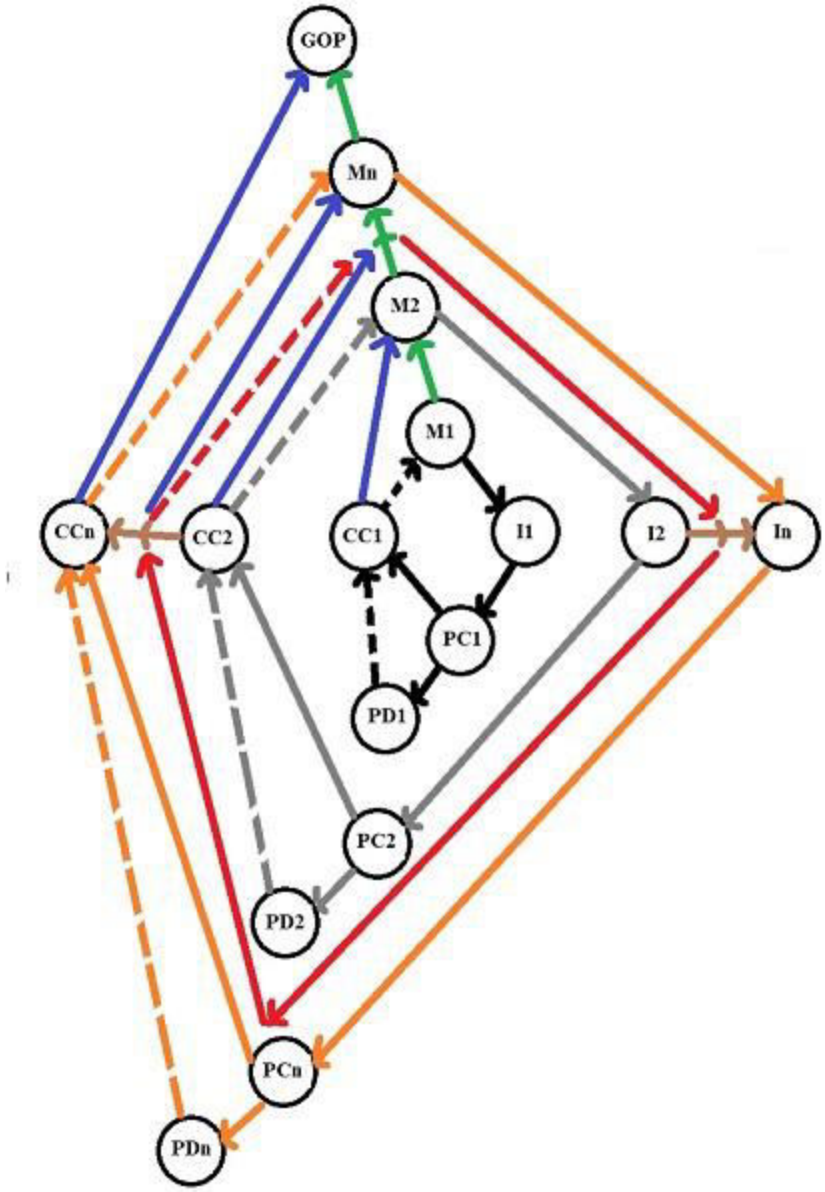

Figure 1 The Thomas Kuhn's paradigm transformation loop
Abnormalities or inconsistencies(I1 to In) are removed until we reach a golden paradigm(GOP), a paradigm with no abnormalities.

We can observed based on Figure 1 above that: i) When the abnormality I1 is removed by the first Thomas Kuhn's paradigm evolution loop at the centre, then M1 shifts to M2 under academic integrity as indicated by the blue arrow from CC1 to M2; ii) When the abnormality I2 is remove by the second Thomas Kuhn's paradigm evolution loop, then M2 shifts up under academic integrity as indicated by the blue arrow from CC2, and this process continues until the paradigm shifts to the last flawed model Mn as indicated by the blue arrow to Mn; and iii) When the abnormality In is removed by the last Thomas Kuhn's paradigm evolution loop, then there is a shift from paradigm Mn to GOP under academic integrity as indicated by the blue arrow from CCn to GOP. Notice in Figure 1 above that the golden paradigm GOP produces no

abnormalities as all abnormalities are now internalized. And it is important to point out too that as abnormalities are internalized and paradigm shifts are taking place from M1 to M2 all the way to Mn and finally to GOP the related scientific knowledge is expanding as we close all those paradigm shifts knowledge gaps that come along paradigm shifts as indicated by the green arrow from M1 to GOP.

c) The 3 different ways to transform a flawed paradigm with 2 abnormalities into a golden paradigm using the TKTL transformation loop

If we have a flawed paradigm(FLM = M) such as the dominant component R paradigm with "2" abnormalities or inconsistencies "I", then it has the following structure:

2) FLM = M = RI1I2

i) Transformation 1 towards the golden paradigm: First removing abnormality I1 and then removing abnormality I2

The Thomas Kuhn's transformation loop when removing abnormality I1 through abnormality internalization works as indicated below:

TKTL1(FLM1) = TKTL1(M1) = M2 = R.I[I1]I2

When removing abnormality I2, we have the following:

TKTL2(M2) = R,I[I1I2] = GOP

Implications: 1) Removing abnormality I1 shifts model M1 to M2; 2) Removing abnormality I2 from M2 shifts M2 to GOP; and 3) The removal of both abnormalities I1 and I2 leads to the golden paradigm GOP.

The structure of the transformation 1 can be appreciated graphically as shown below in Figure 2:

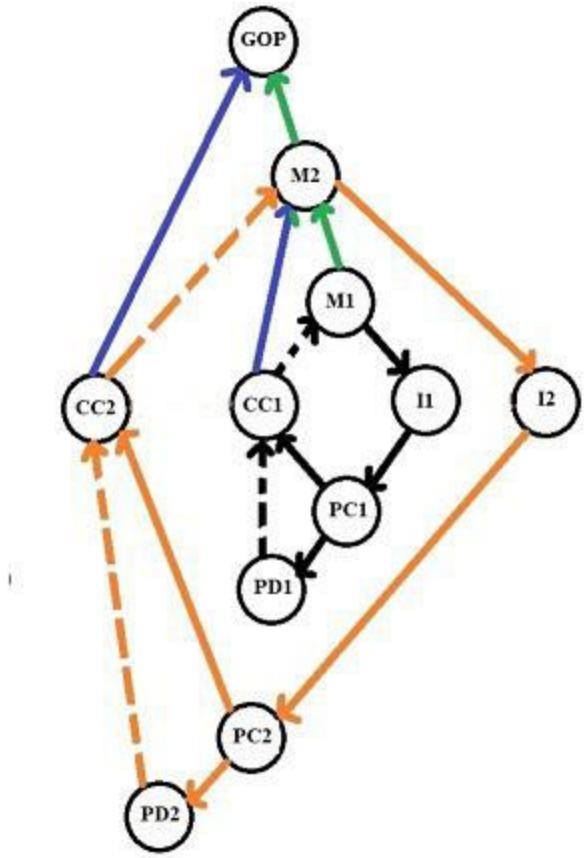

Figure 2 The Thomas Kuhn's paradigm transformation loop(TKTL1) when removing the abnormality or inconsistency I1 first and then removing abnormality or inconsistency I2 shifting paradigm M1 to paradigm M2 and then shifting paradigm M2 to GOP.

We can see based on Figure 2 above that: i) When the abnormality I1 is removed by the first Thomas Kuhn's paradigm evolution loop at the centre, then M1 shifts to M2 under academic integrity as indicated by the blue arrow from CC1 to M2; and ii) When the abnormality I2 is remove by the second Thomas Kuhn's paradigm evolution loop, then M2 shifts to GOP under academic integrity as indicated by the blue arrow from CC2 to GOP. Notice in Figure 2 above that the golden paradigm GOP produces no abnormalities as all abnormalities are now internalized. And it is important to point out too that as abnormalities are internalized and paradigm shifts are taking place from M1 to M2 to GOP the related scientific knowledge is growing as we close all those paradigm shifts knowledge gaps that come along with paradigm shifts as indicated by the green arrow from M1 to GOP.

ii) Transformation 2 towards the golden paradigm: First removing abnormality I2 and then removing abnormality I1

The Thomas Kuhn's transformation loop when removing abnormality I2 through abnormality internalization works as shown below:

TKTL2(FLM2) = TKTL2(M2) = M3 = R.I[I2]I1

When removing abnormality I1, we have the following:

TLTL1(M3) = R.I[I1I2] = GOP

Implications: 1) Removing abnormality I2 shifts model M2 to M3; 2) Removing abnormality I1 from M3 shifts M3 to GOP; and 3) The removal of both abnormalities I1 and I2 leads to the golden paradigm GOP. Hence, the order in which abnormalities are removed it does not matter as in the end we arrived to the golden paradigm GOP.

The structure of the transformation 2 can be appreciated graphically as shown below in Figure 3:

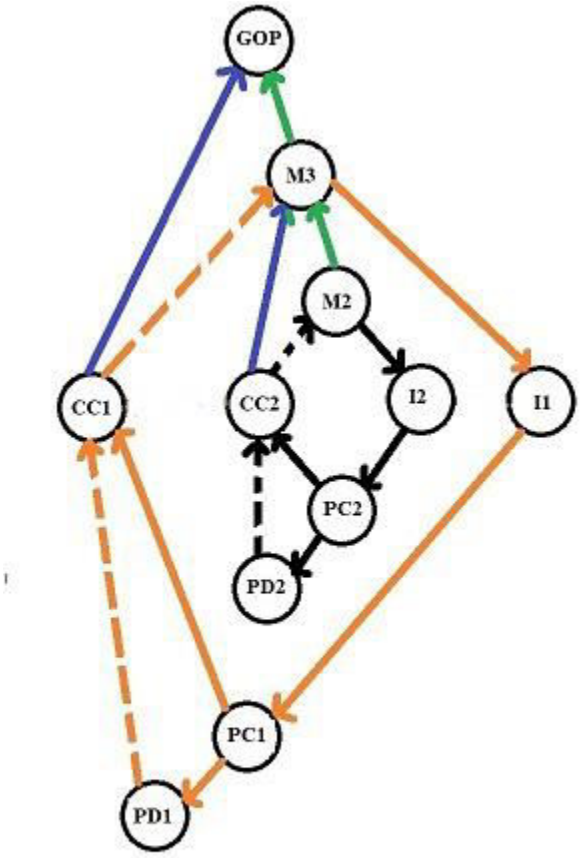

Figure 3 The Thomas Kuhn's paradigm transformation loop(TKTL2) when removing the abnormality or inconsistency I2 first and then removing abnormality or inconsistency I1 shifting paradiing M1 to M3 and then shifting paradigm M3 to GOP

We can indicate based on Figure 3 above that: i) When the abnormality I2 is removed by the first Thomas Kuhn's paradigm evolution loop at the centre, then M2 shifts to M3 under academic integrity as indicated by the blue arrow from CC2 to M3; and ii) When the abnormality I1 is remove by the second Thomas Kuhn's paradigm evolution loop, then M3 shifts to GOP

under academic integrity as indicated by the blue arrow from CC1 to GOP. Notice in Figure 3 above that the golden paradigm GOP produces no abnormalities as all abnormalities are now internalized. And it is important to highlight too that as abnormalities are internalized and paradigm shifts are taking place from M2 to M3 to GOP the related scientific knowledge grows as we close all those paradigm shifts knowledge gaps that come along with paradigm shifts as indicated by the green arrow from M2 to GOP.

iii) Transformation 3 towards the golden paradigm: Removing both abnormalities I1 and I2 at the same time

The Thomas Kuhn's transformation loop when removing abnormality I1 and I2 at the same time through abnormality internalization works as presented below:

TKTL12(FLM12) = TKTL12(M12) = R.I[I1I2] = GOP

Implications: 1) Removing both abnormalities I1 and I2 at the same time shifts model M12 to the GOP; and 2) Removing abnormalities one by one or all together at the same time or in any order or grouping leads in the end to the golden paradigm GOP.

The structure of the transformation 3 can be seen graphically as shown below in Figure 4:

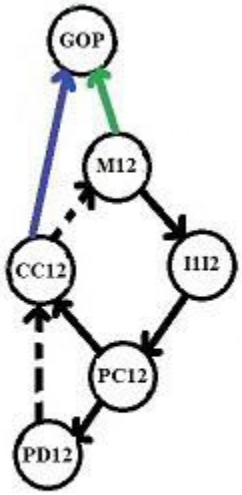

Figure 4 The Thomas Kuhn's paradigm transformation loop(TKTL3) when removing both abnormalities or inconsistencies at the same time(I12) shifting the paradigm M12 to GOP

We can point out based on Figure 4 above that when both the abnormality I1 and the abnormality I2 are removed at the same time by the Thomas Kuhn's paradigm evolution loop, then M12 shifts to GOP under academic integrity as indicated by the blue arrow from CC12 to GOP. You can appreciate based on Figure 4 above that the golden paradigm GOP produces no abnormalities as all abnormalities are now internalized. And it is important to stress too that as abnormalities are internalized and paradigm the shifts takes place from M12 to GOP the related

scientific knowledge grows as we close all those paradigm shifts knowledge gaps that come along with paradigm shifts as indicated by the green arrow from M12 to GOP.

d) The need to understand the three different ways in which the Thomas Kuhn's evolution loop can be used to transform the traditional market into golden paradigms like sustainability markets

Based on the discussion above, it can be said that a paradigm that has abnormalities or inconsistencies is a flawed paradigm. If we place this flawed paradigm under the Thomas Kuhn's paradigm transformation loop under academic integrity we arrive in the end, no matter the order in which the abnormalities are removed by internalization processes, to a golden paradigm, a paradigm with no abnormalities. This holds true for any flawed paradigm, including the traditional market paradigm, which we all know or should know has social and environmental abnormalities embedded in it that need to be removed to go beyond economic thinking as usual and move towards sustainability markets, the golden paradigms at the end of fully correcting traditional markets. Hence, this paper focuses on applying the Thomas Kuhn's paradigm transformation theory to the traditional market in order to remove its social and/or environmental abnormalities to transform it in the end into a sustainability market, a market without social and environmental abnormalities, and therefore, a golden market. Which raises the question, how can the different roads towards sustainability markets that come along when placing the traditional market model of Adam Smith under the Thomas Kuhn's paradigm transformation loop be pointed out analytically and graphically? One of the goals of this paper is to provide an answer to this question.

Goals of this paper

a) To highlight the structure of the traditional market as a flawed dominant economic component based model in terms of social and environmental externalities; b) To point out the structure of the sustainability market as a golden economic paradigm without social and environmental externalities; c) To stress out how the Thomas Kuhn's transformation loop shifts the traditional market towards sustainability markets by going green markets first; d) To indicate how the Thomas Kuhn's transformation loop shifts the traditional market towards sustainability markets by going red markets first; and e) to show how the Thomas Kuhn's transformation loop shifts the traditional market towards sustainability markets directly when internalization both social and environmental externalities at the same time.

Methodology

First, the terminology used in this paper is shared. Second, the dominant component-dominated component structure of the traditional market is pointed out. Third, the full dominant component co-dominance structure of the sustainability market is stressed. Fourth, the Thomas Kuhn's transformation loop shifts the traditional market towards sustainability markets by going green markets first is highlighted. Fifth, the Thomas Kuhn's transformation loop shifts the traditional market towards sustainability markets by going red markets first is indicated. Sixth, the Thomas Kuhn's transformation loop shifts the traditional market towards sustainability markets directly when internalizing both social and environmental externalities at the same time is given. And finally, some food for thoughts and relevant conclusions are listed.

Terminology

SQM = Status quo model

I = Abnormality

PC = Paradigm crisis

PD = Paradigm death

CC = Academic consensus to change paradigm

PS = Paradigm shift

DM = Dwarf model

GOM = Golden model

FLM = Flawed model

SFLM = Super flawed model

TM = Traditional market model

SM = Sustainability market model

RM = Red market model

GM = Green market model

a = Social abnormality

c = Environmental abnormality

ac = Socio-environmental abnormality

PCa = Paradigm crises due to social abnormality

PCc = Paradigm crises due to environmental abnormality

PCac = Paradigm crises due to socio-environmental abnormality

PDc = Paradigm death due to environmental abnormality

PDa = Paradigm death due to social abnormality

PDac = Paradigm death due to socio-environmental abnormality

E(AC) = ac = Externalization of social and environmental abnormalities

I[ac] = AC = Internalization of social and environmental abnormalities

A = Dominant social system a = Dominated social system

B = Dominant economic system b = Dominated economic system

C = Dominant environmental system c = Dominated environmental system

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Operational concepts, paradigm structures, relevant market structures, Kuhn's loop transformations, and abnormality externalization and internalization rules

A) Operational concepts

1) Science, the *world based on the scientific truth, this world falls if invalidated.*

2) Ideology, *the world based on the non-scientific truth, this world will tend to persist even if invalidated.*

3) The theory-practice general consistency principle, *the world where the theory of the model must match the practice.*

4) The different model general inconsistency principle, *the world where the theory and practice of different models are inconsistent with each other.*

5) Academic facts, the *science based truth.*

6) Alternative academic facts, *the non-science based truth.*

7) Academic blindness, *the inability to see academic facts due to the existence of knowledge gaps, paradigm shift based or otherwise.*

8) Willful academic blindness, *the willingness to ignore academic facts and consensus.*

9) Sustainability, the world where the interplay of sustainability theory and sustainability practice is aimed at fixing or correcting embedded externality problems.

10) Sustainable development, the world where the interplay of sustainable development theory and sustainable development practice is aimed at patching or managing embedded externality problems.

11) Academic integrity, the duty to respect and defend academic facts and consensus.

12) Golden paradigm, one that does not creates abnormalities.

13) Flawed paradigm, one that creates abnormalities.

14) Kuhn's loop, the science based mechanism that leads to paradigm shift through abnormality correction.

15) Traditional market, the economy only market, the market cleared by the traditional market price.

16) Green market, the environment and economy only market, the market cleared by the green market price.

17) Red market, the society and economy only market, the market cleared by the red market price.

18) Sustainability market, the society, environment and economy market, the market cleared by the sustainability market price.

19) Raw capitalism, the one that does not reflect social and environmental costs associated with production.

20) Green capitalism, the one that reflects environmental costs associated with production, but not social costs.

21) Red capitalism, the one that reflects social costs associated with production, but not environmental costs.

22) Red Marxism, the one that is socially centered, social equality without freedom.

23) Green Marxism, the one that is environmentally centered, environmental equality without freedom.

24) Yellow Marxism, the one that is socially and environmentally centered, social and environmental equality without freedom.

25) Environmentally friendly capitalism, the one under green markets.

26) Socially friendly capitalism, the one under red markets.

27) Socially and environmentally friendly capitalism, the one under sustainability markets.

28) Socially and environmentally unfriendly capitalism, the one under the traditional market.

B) Paradigm structures

1) A golden paradigm

If we have a dominant paradigm R and it is a golden paradigm GOM, then it produces no externalities or no abnormalities A

i) GOM = R

As it can be seen in expression i) above the golden model GOM does not produce abnormalities.

2) A flawed paradigm

If we have a dominant paradigm R and it is a flawed paradigm FLM, then it produces "n" externalities or abnormalities A so as A1,A2,….An

ii) FLM = R.A1, A2,….An

As it can be appreciated in expression ii) above the flawed model FLM produces "n" abnormalities.

C) The Thomas Kuhn's transformation loop(TKTL) under academic integrity

1) Impact on the golden paradigm

If we subject a golden paradigm GOM = R to the Thomas Kuhn's transformation loop(TKTL), the process will have no impact on it as it has no abnormalities A to correct, golden paradigm GOM remains a golden paradigm GOM

iii) TKTL(GOM) = TKTL(R) = R = GOM

The expression iii) above tells us that the golden model displays TKTL loop neutrality as it has no abnormalities to remove.

2) Impact on the flawed paradigm

If we subject a flawed paradigm FLM = **R.A1,A2,….An** to the Thomas Kuhn's transformation loop(TKTL), the loop process will be active until all abnormalities are corrected and a golden paradigm GOM arises

iv) TKTL(FLM) = TKTL(R.A1,A2,….An) -------→R.I[A1, A2….An] = GOM

The expression iv) above tells us that the TKTL loop process transforms flawed dominant paradigms FLM in the end into golden paradigms GOM by correcting the abnormalities A1…..An affecting them through abnormality internalization(I[A]) and shifting them in the process. When all abnormalities "A" are internalized(I[A1…An]), the golden paradigm GOM comes to exist.

D) Relevant market structures

If we have the following: a = social abnormality, c = environmental abnormality, A = dominant society, C = dominant environment, and B = the dominant economy, then the structure of relevant markets can be stated as indicated below:

1) The traditional market as a golden model

i) TM = B

Under externality neutrality assumptions the traditional market TM in section i) above is a golden paradigm, it produces no abnormalities.

2) The traditional market under social abnormalities(a)

ii) TM = aB

Under no social externality neutrality assumptions, the traditional market TM in section ii) above produces social abnormalities "a". It is a flawed paradigm as it has social abnormalities to correct.

3) The traditional market under environmental abnormalities(c)

iii) TM = Bc

Under no environmental externality neutrality assumptions, the traditional market TM in section iii) above produces environmental abnormalities "c". It is a flawed paradigm as it has environmental externalities to correct.

4) The traditional market under socio-environmental abnormalities(ac)

iv) TM = aBc

Under no socio-environmental externality neutrality assumptions, the traditional market TM in section iv) above produces socio-environmental abnormalities "ac". It is a flawed paradigm as it has social and environmental externalities to correct.

5) The red market under environmental abnormalities(c)

v) RM = ABc

Under no environmental externality assumptions, the red market RM in section v) above produces environmental abnormalities. It is a flawed paradigm as it has environmental externalities to correct. Notice that in the red market RM, both society(A) and economy(B) are in dominant form.

6) The green market under social abnormalities(a)

vi) GM = aBC

Under no social externality assumptions, the green market GM in section vi) above produces social abnormalities. It is a flawed paradigm as it has social externalities to correct. Notice that in the green market GM, both the economy(B) and the environment(C) are in dominant form.

7) The sustainability market has no abnormalities

vii) SM = ABC

The sustainability market SM in section vii) above produces no abnormalities as all components are in dominant form since all components are now endogenous to the model. It is a golden paradigm as it has no abnormalities to correct.

E) Abnormality externalization and internalization rules

If y, x, z are three abnormalities and Y, X, Z are the corrected variables and if E[ ] = externalization and I[ ] = internalization, then the following holds true:

a) E[Y] = y **b) E[X] = x** **c) E[Z] = z**

d) I[y] = Y **e) I[x] = X** **f) I[z] = Z**

g) I{E[Y]} = Y **h) E{I[y} = y** **i) E[YX] = yx**

The structure of the traditional market as a flawed market

It can be said that the traditional market(TM) is a flawed paradigm(FLM) because it produces social(a) and environmental(c) abnormalities or inconsistencies as economic activity take place, which can be stated analytically as done below:

TM = FLM = aBc

The expression above tells us that the traditional market is an economy only market that produces social(a) and environmental(c) externalities.

The structure of the sustainability market is a golden paradigm

It can be said that the sustainability market(SM) is a golden paradigm(GOP) because it does not produces social abnormalities(a) and it does not produces environmental abnormalities(c) as they are internalized so that I[a] = A and I[c] = C, which can be indicated analytically as follows:

SM = GOP = ABC

The expression above indicates that economic activity(B) in sustainability markets(SM) is fully social and environmentally responsible(AC).

The three different ways of transforming the traditional market(TM) into the sustainability market(SM) to save capitalism

As the traditional market(TM) has two abnormalities that need to be removed through externality internalization to shift it towards sustainability markets, namely social abnormalities(a) and environmental abnormalities(c), there are indirect routes and direct routes for the Kuhn's transformation loop to ensure the shift in the end towards sustainability markets. The indirect routes are i) going green markets first, and then sustainability markets; and ii) the other is going red markets first, and then sustainability markets. The direct route is going from the traditional market directly to the sustainability market by closing social and environmental abnormalities at the same time. All these routes and how they work are described below in detail. Notice that the social and environmental abnormalities associated with the traditional business model of Adam Smith(Smith 1776) and the need to correct them were pointed out loudly by the Brundtland commission in 1987(WCED 1987) while the United Nations Commission on Sustainable Development in 2012(UNCSD 2012a; UNCSD 2012b) gave priority only to the environmental transformation to the business as usual model to bring it in the domain of green markets, green growth and green economies.

i) Transformation 1: Transforming the traditional market into a sustainability market by removing the environmental abnormality first, and the social abnormality later.

When removing the environmental abnormality(c) associated with the traditional market(TMc) first through environmental externality internalization(I[c]) the Thomas Kuhn's transformation loop works as indicated below:

TKTLc(TMc) = TKTLc(FLMc) = GM = aB(I[c]) = aBC

The expression above tells us that when we remove the environmental externality affecting the traditional market(TMc) we shifts it towards green markets(GM), a market where the environmental issue(C) is now internalized, but which is still a flawed model in social terms as the social abnormality(a) is still in play.

When removing the social abnormality(a) associated with the green market(GM) through social externality internalization(I[a]) the Thomas Kuhn's transformation loop operates as follows:

TKTLa(GMa) = (I[a])BC = ABC = SM = GOP

The expression above indicates that when we remove the social externality affecting the green market(GMa) we shifts it towards sustainability markets(SM), a market where both the social and the environmental issue(AC) are now internalized; and hence, it is a golden paradigm.

The structure of the indirect transformation 1 through green markets(GM) can be appreciated graphically as shown below in Figure 5:

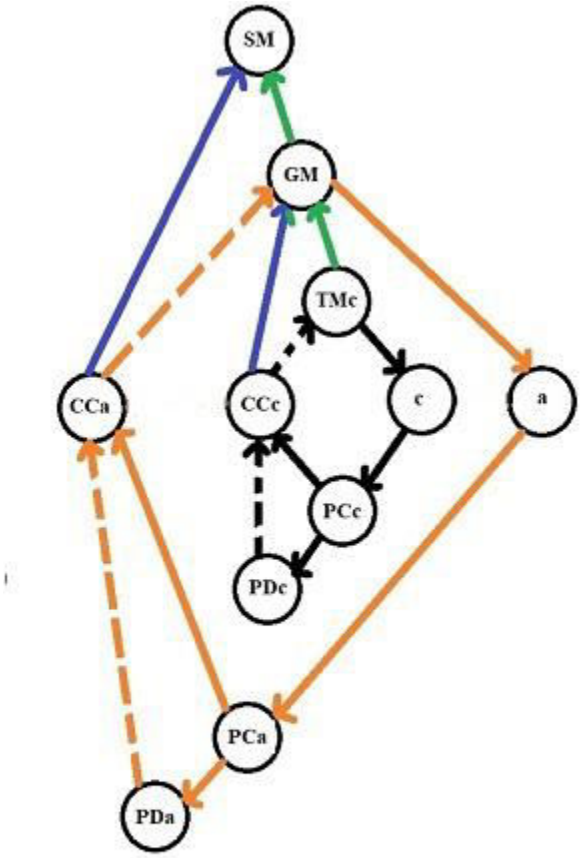

Figure 5 **The Thomas Kuhn's paradigm transformation loop(TKTL1) when removing the environmentally externality or inconsistency (I1 – c) firt and then removing the social abnormality or inconsistency(I2 – a) shifting the traditional market paradigm TMc to the green market paradigm GM, and then shifting the green market paradigm GM to the sustainability market SM**

We can see based on Figure 5 above that: i) When the environmental abnormality "c" is removed by the first Thomas Kuhn's paradigm evolution loop at the centre, then TMc shifts to the green market GM under academic integrity as indicated by the blue arrow from CCc to GM; and ii) When the social abnormality "a" is remove by the second Thomas Kuhn's paradigm evolution loop, then the green market GM shifts to the sustainability market SM under academic integrity as indicated by the blue arrow from CCa to SM. Notice in Figure 5 above that the sustainability market SM as a golden paradigm GOP produces no abnormalities as all abnormalities are now internalized. And it is important to point out too that as environmental and social abnormalities are internalized and paradigm shifts are taking place from TMc to GM

to SM the related scientific knowledge base is growing as we close all those paradigm shifts knowledge gaps that come along with paradigm shifts as indicated by the green arrow from TMc to SM. Notice too that the green market GM is an environmentally friendly market and the basis for green capitalism, and that the sustainability market SM is a socially and environmentally friendly market and the basis for sustainability based capitalism.

Implication 1

Closing the environmental sustainability gap affecting the traditional market TM by environmental externality internalization through the Kuhn's transformation loop shifts the traditional market TM towards the green market GM:

I[c]

TMc----------→GM

The expression above shows the shift from traditional markets TM to green markets GM.

Implication 2

Closing the social sustainability gap affecting the green market GM by social externality internalization through the Kuhn's transformation loop shifts the green market GM towards the sustainability market SM:

I[a]

GMa----------→SM

The expression above shows the shift from green markets GM to sustainability markets SM.

ii) Transformation 2: Transforming the traditional market into a sustainability market by removing the social abnormality first

When removing the social abnormality(a) associated with the traditional market(TMa) first through social externality internalization(I[a]) the Thomas Kuhn's transformation loop works as shown below:

TKTLa(TMa) = TKTLa(FLMa) = RM = (I[a])Bc = ABc

The expression above shows us that when we remove the social externality affecting the traditional market(TMa) we shifts it towards red markets(RM), a market where the social issue(A) is now internalized, but which is still a flawed model in environmental terms as the environmental abnormality(c) is still present.

When removing the environmental abnormality(c) associated with the red market(RM) through environmental externality internalization(I[c]) the Thomas Kuhn's transformation loop operates as follows:

TLTLc(RMc) = AB(I[c]) = ABC = SM = GOP

The expression above indicates that when we remove the environmental externality affecting the red market(RM) we shifts it towards sustainability markets(SM), a market where both the social and the environmental issue(AC) are now internalized; and hence, it is a golden paradigm.

The structure of the indirect transformation 2 through red markets(RM) can be seen graphically as shown below in Figure 6:

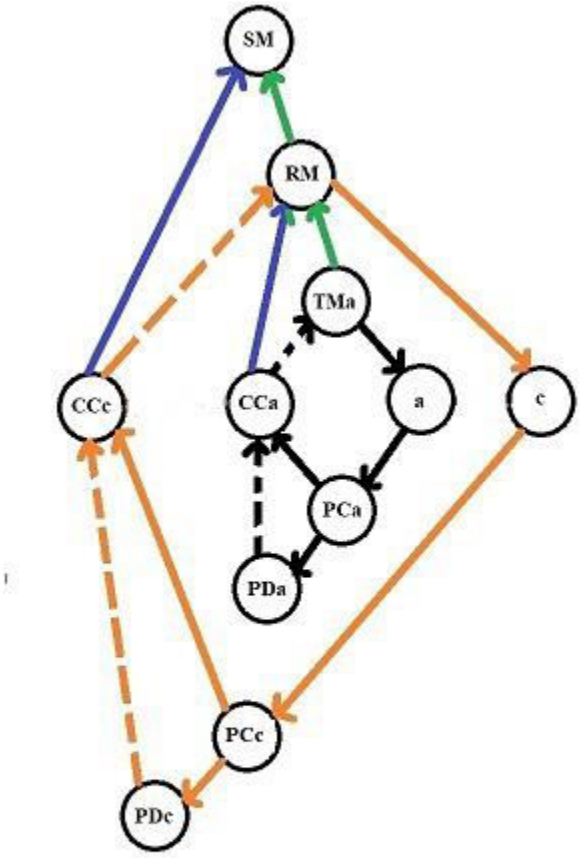

Figure 6 The Thomas Kuhn's paradigm transformation loop(TKTL2) when removing the social abnormality or inconsistency(I2 = a) first and then removing the environmental abnormality or inconsistency (I1 = c) shifting the traditional market paradigm TMa to the red market paradigm RM, and then shifting the red market RM to the sustainability market SM

We can see based on Figure 6 above that: i) When the social abnormality "a" is removed by the first Thomas Kuhn's paradigm evolution loop at the centre, then TMa shifts to the red market RM under academic integrity as indicated by the blue arrow from CCa to RM; and ii) When the environmental abnormality "c" is remove by the second Thomas Kuhn's paradigm evolution loop, then the red market RM shifts to the sustainability market SM under academic integrity as indicated by the blue arrow from CCc to SM. Notice in Figure 6 above that the sustainability market SM as a golden paradigm GOP produces no abnormalities as all abnormalities are now internalized. And it is important to point out too that as social and environmental abnormalities are internalized and paradigm shifts are taking place from TMa to RM to SM the related scientific knowledge base is growing as we close all those paradigm shifts knowledge gaps that come along with paradigm shifts as indicated by the green arrow from TMa to SM. Notice too that the red market RM is a socially friendly market and the basis for red capitalism, and that the sustainability market SM is a socially and environmentally friendly market and the basis for sustainability based capitalism.

Implication 3

Closing the social sustainability gap affecting the traditional market TM by social externality internalization through the Kuhn's transformation loop shifts the traditional market TM towards the red market RM:

I[a]

TMa----------→RM

The expression above shows the shift from traditional markets TM to red markets RM.

Implication 4

Closing the environmental sustainability gap affecting the red market RM by environmental externality internalization through the Kuhn's transformation loop shifts the red market RM towards the sustainability market SM:

I[c]

RMc----------→SM

The expression above shows the shift from red markets RM to sustainability markets SM.

iii) Transformation 3: Transforming the traditional market into a sustainability market by removing the social abnormality and environmental abnormality at the same time

When removing both the social abnormality(a) and the environmental abnormality(c) associated with the traditional market(TMac) at the same time through social and environmental

externality internalization(I[ac]) the Thomas Kuhn's transformation loop performs as indicated below:

TKTLac(TMac) = TKTLac(FLMac) = (I[a])B(I[c]) = ABC = SM = GOP

The expression above tells us that when we remove both the social and the environmental externality affecting the traditional market(TMac) at the same time we shifts it towards sustainability markets(SM),a market where both the social and the environmental issue(AC) are now internalized; and hence, it is a golden paradigm.

The structure of the direct transformation 3 through green markets(GM) can be appreciated graphically as shown below in Figure 7:

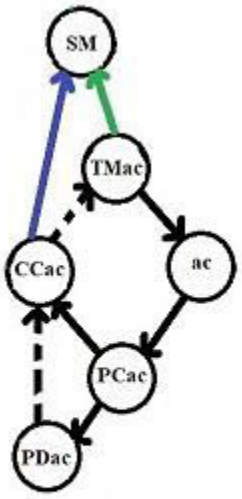

Figure 7 The Thomas Kuhn's paradigm transformation loop(TKTL3) when removing both the environmetnal abnormality(I1 = c) and the social abnormality(I2 = a) at the same time shifting the traditional market paradim TMac to the sustainability market paradigm SM

We can point out based on Figure 7 above that when both the social abnormality "a" and the environmental abnormality "c" are removed at the same time by the Thomas Kuhn's paradigm evolution loop, then the market TMac shifts to sustainability markets SM under academic integrity as indicated by the blue arrow from CCac to SM. You can appreciate based on Figure 7 above that the sustainability market SM as a golden paradigm GOP produces no abnormalities as all abnormalities are now internalized. And it is important to stress too that as social and environmental abnormalities are internalized and the paradigm the shift takes place from the market TMac to the sustainability market SM the related scientific knowledge base grows as we close all those paradigm shifts knowledge gaps that come along with paradigm shifts as indicated by the green arrow from TMac to SM. Notice too that the sustainability market SM is a socially and environmentally friendly market and the basis for sustainability based capitalism.

Implication 5

Closing the social and environmental sustainability gap affecting the traditional market TM by social and environmental externality internalization through the Kuhn's transformation loop shifts the traditional market TM towards the sustainability market SM:

I[ac]

TMac----------→SM

The expression above shows the shift from traditional markets TM to sustainability markets SM.

Food for thoughts

1) Should we expect paradigm shifts to actually take place when the Thomas Kuhn's transformation loop is under willful academic blindness? I think No, what do you think?; 2) Can externality neutrality assumptions lead to passing flawed paradigms as golden paradigms? I think Yes, what do you think?; and 3) Do the growth of scientific knowledge is blocked when there is paradigm shift avoidance despite academic consensus to change paradigm? I think yes, what do you think?

Conclusions

First, it was shown when the Thomas Kuhn's transformation loop removes the environmental externality from the traditional market it shifts it to green markets; and that when removing the social externality associated with the green markets, then the green market shifts toward the sustainability market, first type of transformation. Second, it was indicated that when the Thomas Kuhn's transformation loop removes the social externality from the traditional market it shifts it to red markets; and that when removing the environmental externality associated with the red markets, then the red market shifts toward the sustainability market, second type of transformation. Third, it was stressed that when the Thomas Kuhn's transformation loop removes both the social and environmental externality from the traditional market it shifts it to sustainability markets, third transformation type.

In general, it was described in detail analytically and graphically how the Thomas Kuhn's transformation loop can be used in indirect and direct ways to shift the flawed traditional market towards the golden paradigm known as the sustainability market using externality internalization theory.

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