

## Citation:

Muñoz, Lucio, 2021. **Sustainability thoughts 123: How are green market paradigm shift knowledge gaps created from the pure capitalism angle? In which ways can they lead to the mishandling of the expected paradigm shift from pure capitalism to environmentally friendly capitalism?**, In: *International Journal of Management studies and Social Science Research(IJMSSSR)*, Vol. 3, Issue 2, March-April, Pp 63-75, ISSN: 2582-0265, India.

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**Sustainability thoughts 123: How are green market paradigm shift knowledge gaps created from the pure capitalism angle? In which ways can they lead to the mishandling of the expected paradigm shift from pure capitalism to environmentally friendly capitalism?**

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## Abstract

Perfect markets have a knowledge base that supports their model structure, their choice structure, and their price structure. In the case of red socialism markets, a one dominant component based market, the knowledge base is red socialism a la Karl Marx or pure red socialism. In the case of the traditional market, another one dominant component market, the knowledge base is micro-economic and macro-economic thinking or pure capitalism thinking. And in the case of environmentally friendly capitalism or green market, a two dominant component based market, the knowledge base is green micro-economic and green macro-economic thinking. We know that one dominant component based markets are linked to a related two component based markets by sustainability gaps. For example, the red socialism market is linked to red markets by an economic sustainability gap; and traditional markets are linked to the green market by an environmental sustainability gap. And when sustainability gaps are closed, then paradigms shift from one dominant component market such as the traditional market to a two dominant component market such as a green market creating paradigm shift knowledge gaps in the process, in this case traditional market led green market paradigm shift knowledge gaps, which can affect the proper handling of the expected paradigm shift such as the expected shift from pure capitalism to environmentally friendly capitalism or green markets

under environmental sustainability pressures as it seems to have been the case in 2012 Rio + 20. And this raises the questions, how are green market paradigm shift knowledge gaps created from the pure capitalism angle? In which ways can they lead to the mishandling of the expected paradigm shift from pure capitalism to environmentally friendly capitalism? Among the goals of this paper are to provide answers to those questions, analytically and graphically.

## Key words

Sustainability, red socialism market, traditional market, red market, paradigm shift, sustainability gap, economic sustainability gap, social sustainability gap, environmental sustainability gap, green market, knowledge gap, Adam Smith, Karl Marx, paradigm flip, social externality management, environmental externality management

## Introduction

### a) The structure of perfect markets

Perfect markets have a knowledge base that supports their model structure, their choice structure, and their price structure as indicated recently (Muñoz 2020) as summarized in Figure 1 below.

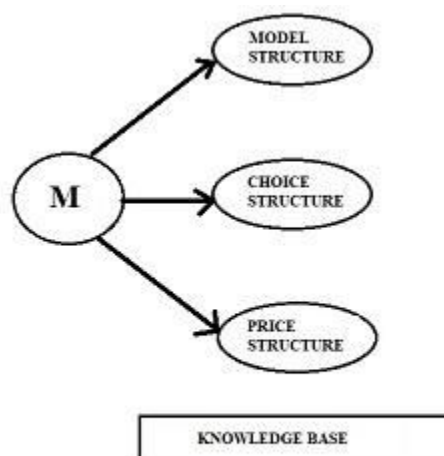


Figure 1 The structure of perfect markets(M)

Figure 1 above let us see that there is a knowledge base in perfect markets(M) that supports the model structure, the choice structure. and the price structure of that market paradigm. Different perfect markets have a different knowledge base supporting them. For example, if M were the red socialism market then its knowledge base would be Karl Marx's red socialism or society first model (Marx and Engels 1848), the knowledge base that supports the

structure of the perfect red socialism market, its independent choice structure and its social cost based pricing mechanism. Hence, the knowledge base of one market does not work supporting the working of a different market as for example Karl Marx's red socialism knowledge base is inconsistent with perfect sustainability market structures(Muñoz 2016a) and perfect sustainability market competition(Muñoz 2019a).

**b) The structure of the perfect traditional market**

In the case of the traditional market(TM), a one dominant component based market, where the economy(B) is the only component in dominant form, the knowledge base is micro-economics and macro-economics, and this knowledge base is summarized in Figure 2 below.

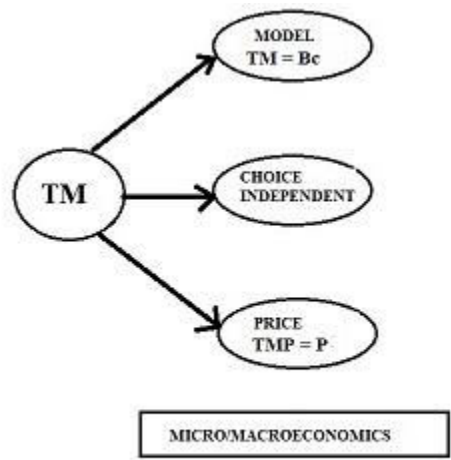


Figure 2 The structure of the perfect traditional market(TM)

Figure 2 above tells as the following about the traditional market(TM) knowledge base: i) it has a model structure where the economy is the only dominant component(TM = Bc) as the environment is a passive component(c); ii) it has an economy led independent choice structure; and iii) it has market pricing mechanism set at economic cost plus profits(TMP = P = ECM + i ). Notice that the core value of the traditional market(TM) as stressed recently(Muñoz 2015; Muñoz 2017) is economic responsibility(B) so the traditional market knowledge base exists to support this core value; and this is because Adam Smith's world is an economy first model.

**c) The structure of perfect environmentally friendly traditional markets or green markets**

In the case of the perfect environmentally friendly traditional market(GM), a two dominant component based market as both the economy(B) and the environment(C) are both in dominant form, the knowledge base is green micro-economic and green macro-economic thinking, as indicated in Figure 3 below:

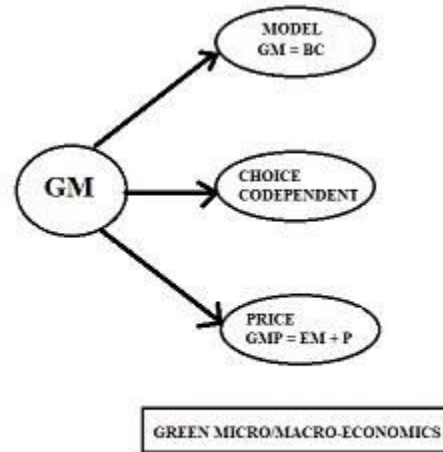


Figure 3 The structure of the perfect green market(GM)

Figure 3 above lets us see the following about the environmentally friendly traditional market or green market(GM) knowledge base: i) it has a model structure where both the economy(B) and the environment(C) are in dominant form at the same time( $GM = BC$ ); ii) it has an economy and environment led codependent choice structure; and iii) it has market pricing mechanism that accounts for both economic costs(P) and environmental costs(EM) of production at the same time. Notice that the core value of environmentally friendly capitalism or green markets(GM) as recently stressed(Muñoz 2016b; Muñoz 2019b) is eco-economic responsibility(BC) so the green micro-economics and green macro-economics knowledge base exists to support this codependent core value. Green micro-economics from the capitalism angle means the theory of environmentally friendly firms and of environmentally friendly consumers or firms and consumers that are environmentally friendly; and green macro-economics means the theory of the environmentally friendly macro-economy. And therefore, from the pure capitalism angle, a green market is an environmentally friendly traditional market as it transforms pure capitalism into environmentally friendly capitalism.

#### d) Linking the perfect traditional market(TM) with the green market(GM)

We know that one dominant component based markets are linked to a related two component based market by sustainability gaps. For example, red socialism markets( $KM = Ab$ ) are linked to the red market( $RM = AB$ ) by an economic sustainability gap(ESG); and the traditional market( $TM = Bc$ ) is linked to green markets( $GM = BC$ ) by an environmental sustainability gap(ESG), a situation that can be stressed analytically by contrasting the structure of the traditional market(TM) and the structure of the green market(GM) as follows:

$$1) TM.GM = (Bc)(BC) = (BB)(cC) = B(cC) = B(ESG), \text{ where } ESG = cC$$

Expression 1) above simply tells us that there is an environmental sustainability gap(ESG) separating the traditional market(TM) from the green market(GM), a situation that can be stated graphically as in Figure 4 below:

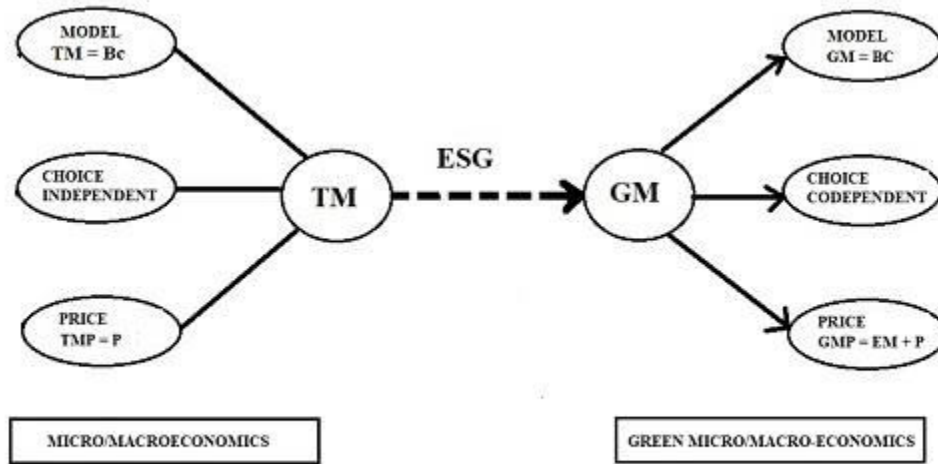


Figure 4 Linking the traditional market(TM) with the green market(GM)

Figure 4 above clearly shows the environmental sustainability gap(ESG) separating the traditional market(TM) from the environmentally friendly traditional market or green market(GM). Notice in Figure 4 above that the knowledge base in both markets is different, and as indicated above the knowledge base in one market does not work in the other market as they have different core values. For example the knowledge base supporting the traditional market of Adam Smith(TM), micro-economics and macro-economics in Figure 4 above does not work in green markets(GM); and the green micro-economics and green macroeconomics knowledge base supporting green markets(GM) do not work in traditional markets(TM).

**e) The need to understand the link between traditional market led green market paradigm shift knowledge gaps and the mishandling of an expected paradigm shift from pure capitalism markets to environmentally friendly capitalism markets or green markets**

Consistent with Figure 4 above and with paradigm death and shift expectations(Muñoz 2019c) when environmental sustainability gaps(ESG) are closed, then traditional market paradigms are expected to shift from an economy only dominant component market to an environment and economy dominant component market or green market(GM = BC) as now both components are relevant, creating pure capitalism led green market paradigm shift knowledge gaps in the process. Under environmental sustainability gap(ESG) pressures pure capitalism is expected to shift towards environmentally friendly capitalism to keep its core value of economic responsibility intact, and it is not expected to flip to its competing paradigm of deep environmental markets(ENM) as it not going to or it is not prepared to trade economic responsibility for environmental responsibility since the traditional market knowledge base can clearly be used to manage the environmental sustainability gap preserving that way the core

value of economic responsibility while under green market paradigm shift knowledge gaps, which seems to be what happened in 2012 Rio + 20 conference(UNCSD 2012a; UNCSD 2012b) when the shift to green markets was made in theory, but it was not completed in practice because of the green paradigm shift knowledge gap; and decision makers then started using environmental externality management frameworks to deal with environmental issues instead. Notice that if the knowledge base of green markets was known in 2012, there would have not been a problem in guiding the shift from traditional markets to green markets smoothly and move that way to a world far away from business as usual as the Brundtland Commission(WCED 1987) encouraged us to do in 1987 in “Our Common Future”. And this raises the questions, how are green market paradigm shift knowledge gaps created from the pure capitalism angle? In which ways can they lead to the mishandling of the expected paradigm shift from pure capitalism to environmentally friendly capitalism? How the environmental externality management market structure that comes from patching the environmental sustainability gap affecting the traditional market looks like? Among the goals of this paper are to provide answers to those questions, analytically and graphically.

### **Goals of this paper**

i) To show how when the environmental sustainability gap is closed the traditional market paradigm shifts towards green markets creating in the process pure capitalism led green market paradigm shift knowledge gaps; ii) To highlight the different ways in which pure capitalism led green market knowledge gaps can lead decision makers to mishandle the expected paradigm shift from pure capitalism to environmentally friendly capitalism; iii) To stress how the nature of the pure capitalism led green market knowledge gap can be linked to the expected actions taken by decision makers to address paradigm shift pressures; and iv) to point out the structure of the patching of the traditional market or pure capitalism market using environmental externality management markets, both analytically and graphically

### **Methodology**

i) The terminology and operational concepts and rules supporting the ideas in this paper are introduced; ii) The way pure capitalism led green market paradigm shift knowledge gaps are created when environmental sustainability gaps are closed and the pure capitalism paradigm shifts towards environmentally friendly capitalism or green markets is highlighted both analytically and graphically; iii) The three types of problems associated with the creation of pure capitalism led green market paradigm shift knowledge gaps and how they affect the handling of the expected paradigm shift from pure capitalism markets to green markets are stressed both analytically and graphically; iv) The nature of the pure capitalism led green market paradigm shift knowledge gaps and the expected actions of decision makers are linked and relevant

implications are stressed both analytically and graphically; v) The structure of the patching of the traditional market or pure capitalism market using environmental externality management markets is stressed, both analytically and graphically; and vi) Some food for thoughts and conclusions are given.

## Terminology

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A = Active social system	a = Passive social system
B = Active economic system	b = Passive economic system
C = Active environmental system	c = Passive environmental system
S = Sustainability	SG = Sustainability gap
SSG = Social sustainability gap	ECSG= Economic sustainability gap
KM = Red socialism market	KMP = Red socialism market price
GM = Green market	GMP = Green market price
RM = Red market	RMP = Red market price
ENM = Environmental market	ENMP = Environmental market price
TM = Traditional market	TMP = Traditional market price

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## Operational concepts and paradigm merging and shift rules and expectations

### i) Operational concepts

- 1) **Red socialism market**, *the society only market.*
- 2) **Red socialism market price**, *the price that reflects only the social cost of production.*
- 3) **The traditional market**, *the economy only market.*
- 4) **The traditional market price**, *the general market economic only price or the price that covers the cost of production at profit ( $TMP = ECM + i = P$ ) or zero profit ( $TMP = ECM = P$ ).*
- 5) **The environmental market**, *the environment only market.*

- 6) **The environmental market price**, *the price that reflects only the environmental cost of production.*
- 7) **The socio-environmental market**, *the society and environment only market.*
- 8) **The socio-environmental market price**, *the price that reflects the social and environmental costs of production.*
- 9) **The red market**, *the society and economy only market.*
- 10) **The red market price**, *the price that reflects the social and economic costs of production.*
- 11) **The green market**, *the economy and environment only market.*
- 12) **The green market price**, *the price that reflects both the economic and the environmental cost of production or the price that covers the cost of environmentally friendly production.*
- 13) **The sustainability market**, *the society, economy and environment market.*
- 14) **The sustainability market price**, *the price that reflects the social, economic, and environmental costs of production.*
- 15) **The economic margin**, *to cover the economic cost of production.*
- 16) **The environmental margin**, *to cover the extra cost of making business environmentally friendly.*
- 17) **The social margin**, *to cover the extra cost of making business socially friendly.*
- 18) **Full costing**, *all costs are reflected in the pricing mechanism of the market.*
- 19) **Partial costing**, *not all costs are reflected in the pricing mechanism of the market.*
- 20) **No costing**, *all costs are not reflected in the pricing mechanism of the market.*
- 21) **Full responsibility**, *when a market uses full costing.*
- 22) **Partial responsibility**, *when a market uses partial costing.*
- 23) **Full irresponsibility**, *when a market uses no costing.*

**ii) Paradigm merging and shift rules and expectations**

**1) Paradigm merging rules(PMR)**

If “A” and “B” are dominant characteristics; and “a” and “b” are their dominated or passive counter parts, the following is expected:



***a) Merging under dominant-dominant interactions***

Under these conditions, dominant or active state prevails as indicated:

$$\begin{array}{ll} (\mathbf{AA}) \rightarrow \mathbf{A} & (\mathbf{BB}) \rightarrow \mathbf{B} \\ (\mathbf{AA}) (\mathbf{BB}) = (\mathbf{AB}) & (\mathbf{AB}) \rightarrow \mathbf{AB} \end{array}$$

***b) Merging under dominated-dominated interactions***

Under these conditions, the dominated or passive form prevails as shown:

$$\begin{array}{ll} (\mathbf{aa}) \rightarrow \mathbf{a} & (\mathbf{bb}) \rightarrow \mathbf{b} \\ (\mathbf{aa})(\mathbf{bb}) = (\mathbf{ab}) & (\mathbf{ab}) \rightarrow \mathbf{ab} \end{array}$$

***c) Merging under dominant-dominated interactions and win-win solutions***

Under these conditions, the dominant or active system prevails as the system merge as shown below:

$$\begin{array}{ll} (\mathbf{Aa}) \rightarrow \mathbf{A} & (\mathbf{bB}) \rightarrow \mathbf{B} \\ (\mathbf{Aa}) (\mathbf{bB}) = (\mathbf{AB}) & (\mathbf{ab}) \rightarrow \mathbf{AB} \end{array}$$

***d) Merging under dominant-dominated interactions and no win-win solutions***

Under these conditions, the dominated or passive system prevails and the system collapses as shown below:

$$\begin{array}{ll} (\mathbf{Aa}) \rightarrow \mathbf{a} & (\mathbf{bB}) \rightarrow \mathbf{b} \\ (\mathbf{Aa}) (\mathbf{bB}) = (\mathbf{AB}) & (\mathbf{ab}) \rightarrow \mathbf{ab} \end{array}$$

**2) Paradigm death expectations and shift under sustainability gaps**

If we have three systems  $X_1 = \mathbf{Ab}$  and a system  $X_2 = \mathbf{aB}$  and  $X_3 = \mathbf{AB}$ , where  $\mathbf{a} = \text{SSG}$  and  $\mathbf{b} = \text{ECSG}$ , then the following is true:

***a) Expressing models in terms of sustainability gaps***

$$\mathbf{X}_1 = \mathbf{Ab} = \mathbf{A}(\text{ECSG}) \quad \mathbf{X}_2 = \mathbf{aB} = (\text{SSG})\mathbf{B}, \text{ where } 0 \leq \text{SSG} < 1 \text{ and } 0 \leq \text{ECSG} < 1$$

$$\mathbf{X}_3 = \mathbf{AB} = \mathbf{A}(\text{SG} = 1)\mathbf{B} = \mathbf{AB}$$

***b) Expressing inverse opposite models in conflict***

$$\mathbf{X}_1 \cdot \mathbf{X}_2 = \mathbf{A}(\text{ECSG}) \cdot (\text{SSG})\mathbf{B}$$

***c) Paradigm death and shift expectations under no win-win conditions***

When  $SSG \rightarrow 0$  and/or  $ECSG \rightarrow 0$  under no win-win conditions, we have the paradigm death and shift expectation where the paradigms that die take the form of the higher level paradigm, in this case the higher level paradigm is  $X_3 = AB$

$X_1.X_2 = A(ECSG \rightarrow 0).(SSG \rightarrow 0)B = \text{the death of paradigm } X_1, X_2, \text{ or both}$

**and shift  $X_1.X_2 \rightarrow X_3 = AB$**

***d) Paradigm death and shift expectations under win-win conditions***

When  $SSG \rightarrow 1$  and/or  $ECSG \rightarrow 1$  under win-win conditions, we have the paradigm shift and merger shift expectation where the paradigms that die take the form of the higher level paradigm, in this case the higher level paradigm is  $X_3 = AB$

$X_1.X_2 = A(ECSG \rightarrow 1).(SSG \rightarrow 1)B = \text{paradigm shift } X_1 \text{ or } X_2 \text{ or merger of } X_1 \text{ and } X_2 \text{ as}$

**$SSG \rightarrow 1 = A$  and  $ECSG \rightarrow 1 = B$  so that  $X_1.X_2 =$**

**$A(B).(A)B = AB.AB = AB = X_3 = \text{merger}$**

Notice that similar expectations and rules hold if  $X_1 = bC$ ,  $X_2 = Bc$ , and  $X_3 = BC$

You can find more details about the working of paradigm death and shift expectations and merging rules in the publication *Paradigm Evolution and Sustainability Thinking* (Muñoz 2019c).

**The closing of environmental sustainability gaps and the creation of pure capitalism led green market paradigm shift knowledge gaps**

Again as mentioned in the introduction, the closing of the environmental sustainability gaps (ESG) in Figure 4 above leads to the shift from pure capitalist markets (TM) to green markets (GM) creating in the process pure capitalism led green market paradigm shift knowledge gaps as indicated in Figure 5 below:

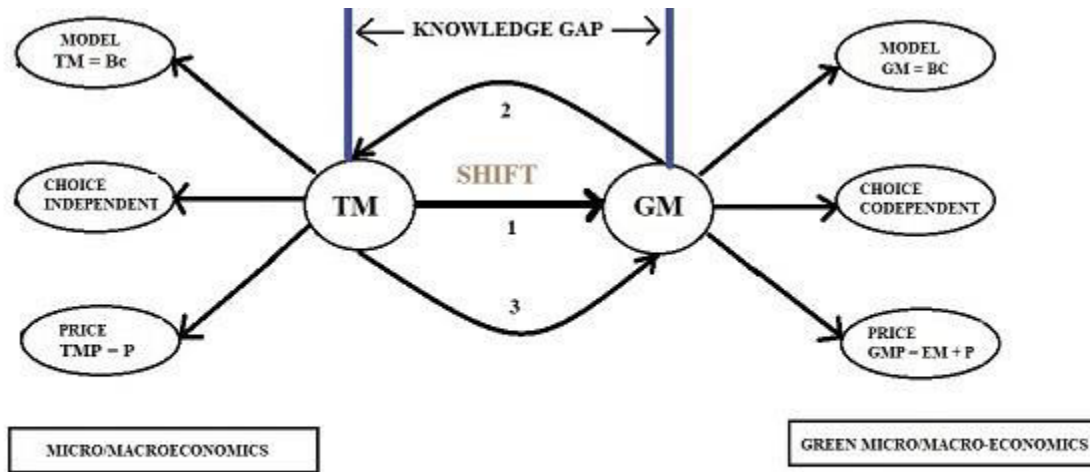


Figure 5 Shifting from perfect traditional market(TM) to perfect green market(GM) leads to the creation of paradigm shift knowledge gaps

The following relevant aspects can be highlighted based on Figure 5 above: i) When we close the environmental sustainability gap(ESG--→1) in Figure 4 above the traditional market model(TM) shifts to the green market model(GM) as indicated by the black arrow 1 from TM to GM; ii) the model structure, the choice structure and the price structure of the pure capitalism markets or traditional market(TM) all shift at the same time taking the model structure, choice structure and price structure of the green market model(GM) as indicated by the black arrow 3 from TM to GM creating pure capitalism led green market knowledge gaps in the process ; iii) When the shift from traditional markets(TM) to green markets(GM) takes place the original knowledge base of the pure capitalism model(TM), including its model structure, its choice structure, and its price structure are left behind as indicated by the black arrow 2 from GM to TM; and iv) and therefore, to be able to properly implement the paradigm shift from pure capitalism or traditional markets(TM) to green markets or environmentally friendly capitalism markets or environmentally friendly traditional markets(GM) we need to develop a new knowledge base as the previous knowledge base no longer works. In other words, the knowledge base of green markets, green micro-economics and green macroeconomics, does not work in pure capitalism or traditional markets a la Adam Smith; and the knowledge base of traditional markets or pure capitalism, micro/macro-economics, does not work in green markets.

**Highlighting the three ways pure capitalism led green market knowledge gaps can lead to the mishandling of the expected paradigm shift from pure capitalism to environmentally friendly capitalism under environmental sustainability pressures**

There are 3 ways in which pure capitalism led green market knowledge gaps can affect the proper implementation of the expected paradigm shift from traditional markets(TM) to green markets(GM) depicted in Figure 5 above: i) they can make it difficult, even impossible to set up

the proper green market structures needed to transition the traditional market or pure capitalism market(TM) to the green market paradigm(GM); ii) they can make it possible to see the dealing with the consequences of the sustainability problem driving the paradigm shift such as the environmental sustainability gaps(ESG) as a solution to the traditional market's environmental sustainability problem when it is just a patch; and iii) they can make it possible to flip the core values of the pure capitalism model, economic responsibility for environmental responsibility, and take the structure of a pure environmental market(ENM), the competing market, if the pure capitalism led green market knowledge gaps were to make it impossible to see the way towards the paradigm shift to green markets, these 3 situations are highlighted in Figure 6 below:

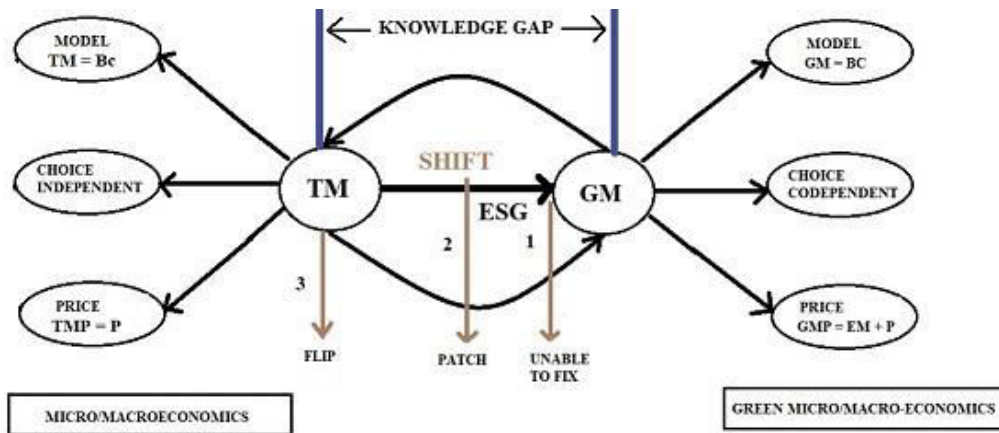


Figure 6 Pointing out three ways in which the knowledge gap can lead to the mishandling of the expected paradigm shift process: unable to fix at point 1, lead to paradigm patching at point 2 or lead to paradigm flip at point 3.

We can use Figure 6 above to point out the three implementations problems that arise when the pure capitalism led green market paradigm shift knowledge gaps are created as detailed below:

**a) The green market paradigm implementation problem:**

There is a green market paradigm implementation problem at point 1 in Figure 6 above as without having ready the new knowledge base needed in the green market, green microeconomics and green macroeconomics thinking, we are unable to fix the traditional or pure capitalism market(TM) to complete efficiently the paradigm shift from traditional markets(TM) to green markets(GM). Therefore, to properly implement the shift from traditional markets or pure capitalism(TM) to environmentally friendly traditional markets or environmentally friendly capitalism markets or green markets(GM) we need to think in terms of green microeconomics and green macro-economics, but that knowledge base does not exist today in capitalist countries, old and new; and therefore, the paradigm shift traditional markets(TM) to green markets(GM) depicted in Figure 6 above could not be completed under full pure capitalism led green market knowledge gaps, that knowledge gap needs to be closed ideally before the paradigm shifts take place or at least closed as fast as possible while the paradigm shift is taking place.

***b) The green market paradigm consequence implementation problem:***

There is a green market paradigm consequence implementation problem in point 2 in Figure 6 above as without having the new knowledge base ready or without having the green microeconomic and green macroeconomic knowledge base then making dealing with the consequences of the sustainability problem driving the paradigm shift or environmental externalities a solution becomes attractive if the old knowledge base(micro/macro-economics) can be adapted to implement an environmental externality management solution to patch the traditional market or pure capitalism markets(TM) to keep its core economic responsibility goals intact while still leaving a remaining environmental sustainability gap(ESG) active between point 2 and point 1 in Figure 6 above. Notice, that environmental externality management is not a fix of the environmental sustainability problem affecting the traditional market and driving the paradigm shift to green markets, but this patch could be used bring about a more smooth transition from pure capitalism to environmentally friendly capitalism as it can be used to gain the time needed to update or transform micro/macro-economic thinking into green micro/green macro-economic thinking so we can properly guide and implement the paradigm shift. If we see the patch as a permanent situation, then the remaining environmental sustainability gap will be increasingly undermining the environmental externality management framework needed to support the environmental externality patch.

***c) The green market paradigm flip implementation problem:***

There is a green market paradigm flip implementation problem at point 3 in Figure 6 above if the pure capitalism led green market knowledge gap were so severe that decision makers in capitalist countries, old and new, could not see the way forward in the expected paradigm shift from traditional markets or pure capitalism markets(TM) to green markets(GM) or they could not see how to manage environmental externalities to patch the traditional market; and because of that they flip the model structure of pure capitalism(TM) to that of the competing model structure or pure environmentalism or environmental market model structure(ENM). Like instead of shifting  $TM = Bc$  to  $GM = BC$ , they flip  $TM = Bc$  to  $ENM = bC$ . In other words, if the pure capitalism led green market paradigm shift knowledge gaps were so severe that decision makers would be unable to see how the direct shift from pure capitalism(TM) to green markets(GM) could be done as well as they were unable to see how environmental externalities could be managed to gain time to transition smoothly from an economy only development model to an environment and economy based development model, then under knowledge gap the only way out the environmental sustainability pressures that they could see would be to flip capitalism(TM) to pure environmentalism(ENM), trading economic responsibility for environmental responsibility, creating an economic sustainability gap problem in the process.

**Implications**

Environmental sustainability gaps separate the pure capitalism or traditional market from the green market. The closing of the environmental sustainability gap shifts the traditional market towards the green market creating pure capitalism led green market paradigm shift knowledge gaps. Decision makers in capitalist countries, old and new, do not have at the moment of paradigm shift the new knowledge base needed to shift to green markets, there is no green micro and green macroeconomic knowledge to properly manage the paradigm shift from traditional markets or pure capitalism to green markets, leading to three type of implementation problems: i) the green market paradigm implementation problem or inability to fix or properly implement the paradigm shift from traditional markets to green markets; ii) the paradigm consequence implementation problem or the idea that patching the traditional market paradigm to deal with the consequence of the sustainability problem the paradigm shift to green markets is trying to fix is the solution; and iii) the green market paradigm flip implementation problem or the idea that being unable to see how to transition from traditional markets to green markets or unable to see how to manage environmental externalities during the transition because of knowledge gaps decision makers simply decide to flip the model structure of traditional markets under environmental sustainability pressures to that of a competing or opposite market paradigm, which has a known knowledge base. Therefore, developing the knowledge base of green markets(GM) before the paradigm shift from pure capitalism or traditional markets(TM) to green markets(GM) actually takes place would solve the knowledge gap problems mentioned above as there would have been no knowledge gaps; and this would provide the proper knowledge tools needed in order to have a smooth transition or direct shift from traditional markets or pure capitalism(TM) to environmentally friendly traditional markets or environmentally friendly capitalism or green markets(GM).

### **Linking the nature of the green market knowledge base relevant to addressing the environmental sustainability gap at hand and the mishandling of expected paradigm shift from pure capitalism to green markets by decision-makers**

Knowing the environmentally friendly capitalism or green market knowledge base would facilitate the fixing of the environmental sustainability gap in Figure 6 above as the green market paradigm implementation problem at point 1 would disappear since decision-makers would know then how to close that environmental sustainability gap, and then there would be no need for paradigm patching thinking or for paradigm flip thinking. Therefore, not knowing the knowledge base of the green market needed to address that environmental sustainability gap creates all the paradigm implementations problems in Figure 6 above. And this has the following implications for decision-makers in capitalist countries, old and new: i) if the knowledge base of the new paradigm, environmentally friendly capitalism or green market, is not put together before the paradigm shift takes place to guide the shift, we cannot fix the environmental sustainability gap; and then we cannot shift from pure capitalism to environmentally friendly capitalism or green market; ii) if the knowledge base of the old

paradigm or Adam Smith's traditional market can be used to partially address the environmental sustainability gap at hand, then the old paradigm or pure capitalism or the traditional market can be patched leaving part of its environmental sustainability gap still active; and iii) if the knowledge base of the new paradigm, environmentally friendly capitalism or green market, is unknown and the way the knowledge base of the old paradigm or Adam Smith's traditional market, can be used to handle partially the environmental sustainability gap is not clear, then we should expect to see a paradigm flip from pure capitalism to pure environmentalism or a flip towards a competing paradigm with a known knowledge base.

In other words, if the way the old paradigm knowledge base or Adam Smith's traditional market knowledge base can be used to partially address the environmental sustainability gap is clear under unknown new paradigm knowledge base, then decision makers will implement pure capitalism or traditional market patches as those indicated at point 2 in Figure 6 above as they do not know how to fully implement the paradigm shift, but understand how to manage environmental externalities, but when it is unclear how the old knowledge base or Adam Smith's traditional market knowledge base can be used to manage environmental externalities, they will implement paradigm flips to competing paradigms as that in point 3 in Figure 6 above, a flip from pure capitalism (economy first model) to pure environmentalism (environment first model). Due to those knowledge gaps hampering the closing of the environmental sustainability gap affecting traditional markets or pure capitalism decision makers can not complete the paradigm shift from pure capitalism to green markets, but since the micro/macro-economic knowledge base of the traditional market can clearly be used to manage the environmental sustainability gap, then we cannot expect to see paradigm flips, but paradigm patches a la environmental externality management market (EEMM), a situation summarized in Figure 7 below:

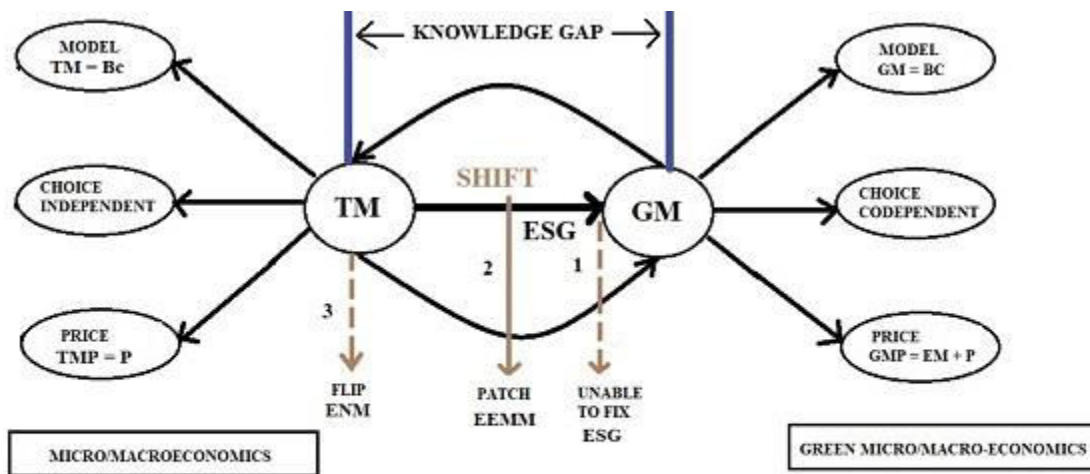


Figure 7 The shift from the perfect traditional market(TM) to the perfect green market(GM) can not be completed under knowledge gaps so the environmental sustainability gap(ESG) can not be fixed, and since the traditional market(TM) will never flip to pure environmentalism(ENM), then the only way out is to patch the traditional market through environmental externality management(EEMM)

The following aspects can be highlighted based on Figure 7 above: i) Decision makers are unable to fix the environmental sustainability gap(ESG) affecting the traditional market(TM) because of the green market paradigm shift knowledge gap as indicated by the broken arrow at point 1; ii) decision makers can use the micro/macro-economic knowledge base to manage the environmental sustainability gap and keep that way the core value of economic responsibility intact so paradigm flips to opposing paradigms like pure environmentalism(ENM) cannot take place as indicated by the broken arrow 3; and iii) therefore, under green market paradigm shift knowledge gaps patching the traditional market or pure capitalism through the use of environmental externality management markets(EEMM) may be seen as the way to go as indicated by the continuous arrow 2, but this action is not a fix, it is a patch as it still leaves a remaining environmental sustainability gap(ESG) active, the portion from point 2 to point 1.

### The patching of the perfect traditional market through environmental externality management markets

As indicated above and in the introduction, unable to shift to green markets(GM) due to the green market paradigm shift knowledge gap or unwilling to flip to pure environmentalism markets(ENM) as the micro/macro-economics knowledge base can be used to manage properly the environmental externality gap to keep economic responsibility intact, decision makers in pure capitalism countries move then to patch the traditional market or pure capitalism using environmental externality management markets(EEMM) as indicated in Figure 8 below:

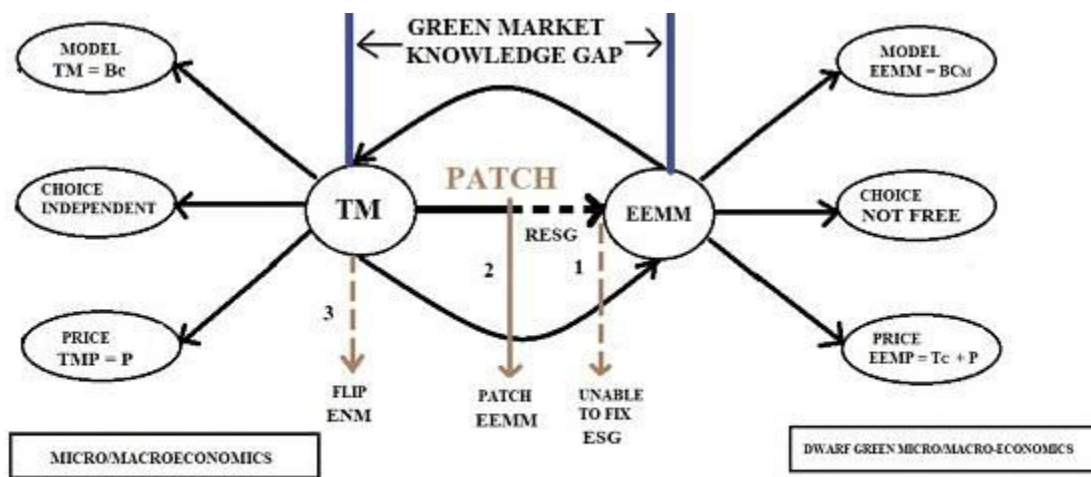


Figure 8 The patching of the traditional market(TM) through environmental externality management based markets(EEMM) leaves a remaining environmental sustainability gap(RESG) still active affecting the sustainability of the environmental externality management market(EEMM)

We can see based on Figure 8 above that under green market knowledge gaps paradigm patching at point 2 is the only viable option left to decision makers to keep the core value of economic responsibility as fully fixing the environmental sustainability gap(ESG) as at point 1 is



not possible and paradigm flipping as at point 3 is not attractive. Notice that the implications of the patching of the traditional market(TM) in Figure 8 above are the following: i) when patching the traditional market(TM) its model structure, its choice structure, its price structure and its knowledge base are patched at the same time taking the structure of the environmental externality management market(EEMM) as indicated by the continuous black arrow going from TM to EEMM; ii) when patching the traditional market(TM), we leave Adam Smith's traditional market world behind as indicated by the continuous black arrow going from EEMM to TM; and iii) when patching the traditional market(TM) we leave a remaining environmental sustainability gap(RESG) still active between point 2 and point 1.

We can clearly see the differences in the structure of the traditional market(TM) and the patched traditional market or EEMM in Figure 8 above: i) they have different model structure,  $TM = Bc$  vrs  $SEMM = BC_M$ ; ii) they have different choice structure, the traditional market(TM) has a free, independent choice vrs the environmental externality management market(EEMM) has a not free, not independent choice; iii) they have different price structure,  $TMP = P$  vrs  $EEMP = P + T_C$ ; and iv) they have a different knowledge based, micro/macro-economics vrs dwarf green micro/macro-economics. Notice that environmental externality management markets(EEMM) can be seen as markets with limited environmental responsibility that comes from managing environmental externalities while green markets are markets with full environmental responsibility that comes from internalizing environmental externalities. Hence, environmental externality management markets(EEMM) are not green markets(GM).

### **Food for thoughts**

i) Would environmentally friendly capitalism win a cold war against pure environmentalism? I think yes, what do you think?; ii) Can paradigm flips and/or externality management frameworks exist in a world with no paradigm shift knowledge gaps? I think no, what do you think?; and iii) Can paradigm shift knowledge gaps feed the illusion that environmental externality management markets are sustainability fixes? I think yes, what do you think?

### **Conclusions**

i) It was indicated that when environmental sustainability gaps are closed the traditional or pure capitalism market shifts towards the green market creating pure capitalism led green market paradigm shift knowledge gaps in the process; ii) It was stressed that these green market paradigm shift knowledge gaps can lead to paradigm shift mishandling as they create three types of problems for decision makers, a paradigm implementation problem, a paradigm consequence implementation problem, and a paradigm flip problem, as the knowledge base of the new

paradigm is either unknown or incomplete, the green economics and green macro-economic knowledge base does not exist today; iii) it was highlighted that under green market knowledge gaps the paradigm shift from traditional markets to green markets cannot be completed and that as environmental externality management is possible using the traditional market knowledge base, then paradigm flipping to pure capitalism to pure environmentalism is not possible; iv) it was pointed out that when paradigm fixing and paradigm flipping is not possible, then paradigm patching will take place to manage the environmental sustainability gap through environmental externality management markets; v) it was mentioned that when the pure capitalism market or traditional market is patched using environmental externality management markets, we leave a remaining portion of the environmental sustainability gap still active and affecting the sustainability of the environmental externality management market; and vi) it was noticed that developing the knowledge base of the new paradigm before the paradigm shift actually takes place would solve the paradigm shift knowledge gap problems and would provide the tools needed for a smooth transition from the old paradigm, pure capitalism, to the new paradigm, environmentally friendly capitalism.

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**Citation:**

Muñoz, Lucio, 2021. **Sustainability thoughts 123: How are green market paradigm shift knowledge gaps created from the pure capitalism angle? In which ways can they lead to the mishandling of the expected paradigm shift from pure capitalism to environmentally friendly capitalism?**, In: *International Journal of Management studies and Social Science Research(IJMSSSR)*, Vol. 3, Issue 2, March-April, Pp 63-75, ISSN: 2582-0265, India.