Citation:

Muñoz, Lucio, 2021. **If Going From Free Markets to Free Markets Is the Science Based Approach: What is Then the Model Structure, Price Structure, Choice Structure and the Knowledge Structure and Related Gaps of the 2012 Paradigm Shift From Perfect Traditional Market to Perfect Green Market Thinking?,** In: ***Insights into Economics and Management*** ,Vol. 5, Chapter 1, Pp 1-17, Book Publisher International, January 21, ISBN: 978-93-90516-50-6 (Print), ISBN: 978-93-90516-51-3(eBook), London, UK.

https://bp.bookpi.org/index.php/bpi/catalog/book/377

10.9734/bpi/ieam/v5

https://doi.org/10.9734/bpi/ieam/v5

If Going From Free Markets to Free Markets Is the Science Based Approach: What is Then the Model Structure, Price Structure, Choice Structure and the Knowledge Structure and Related Gaps of the 2012 Paradigm Shift From Perfect Traditional Market to Perfect Green Market Thinking?

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ABSTRACT

When paradigm shifts they shift from free market to free market or from perfect market to perfect market to maintain or respect the theory-practice consistency principle. The necessary and sufficient condition for a perfect shift to take place is the internalization of externality costs in the pricing mechanism of the market. And when a shift takes place four things are expected to happen at the same time: A model structure shift, a price structure shift, a choice structure shift, and a knowledge structure shift creating in the process model, price, choice, and knowledge gaps. In 2012 there was a paradigm shift from perfect traditional markets to perfect green markets, which raises a very important question: If going from free markets to free markets is the science based approach: What is then the model structure, price structure, choice structure and the knowledge structure and related gaps of 2012 paradigm shift from perfect traditional market to perfect green market thinking? The main goal of this paper is to provide an answer to this question.

Keywords: Traditional market; green market; paradigm shift; traditional market price; green market price; choice structure; model structure; production price structure; knowledge gap

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structure; free markets; perfect markets; externality cost internalization; endogenous issues; externality.

1. INTRODUCTION

1.1 The Traditional Market(TM)

1.1.1 The model structure of the traditional market(TM)

When only the economy (B) matters we have the traditional market of Adam Smith(TM), which can be expressed as follows:

$$TM = aBc \quad (1)$$

The expression above says that in the traditional market(TM), the society (a) and environment(c) exist only to meet the needs of the traditional market(TM) as both social issues (a) and environmental issues(c) are considered externalities or factors exogenous to the traditional market model(TM); and therefore, only the economy (B) is the dominant and endogenous component here. Therefore, development only needs to be economy friendly to be implemented. This is the world of the economic man, of the invisible hand, and of economic growth. This is the universe of the traditional economy. It is known that Adam Smith assumed full externality neutrality [1], which makes the traditional market(TM) a fully irresponsible development model [2].

1.1.2 The choice structure of the traditional market(TM)

The traditional perfect market is a free market, based on rational independent choice (RIC) in production (RICP) and in consumption (RICC). Hence, the traditional market rational independent choice structure (TMRICS) can be represented as follows:

$$TMRICS = TM[RIC] = TM[RICP, RICC] \quad (2)$$

Expression 2 above says that the traditional market rational independent choice structure (TMRICS) is determined by rational independent choice thinking(TM[RIC]), both in production and in consumption(TM[RICP, RICC]).

The world of rational and independent choice is the world of the arrow impossibility theorem [3] and rational choice can be seen as shifting wave by wave when paradigms shift [4].

1.1.3 The knowledge base structure of the traditional market(TM)

The traditional market(TM) knowledge base is traditional economics (TEC) since traditional micro-economics (TMIEC) and traditional macro-economics (TMAEC) support the micro and macro components of the economy respectively. Therefore, the traditional market knowledge base structure (TMKBS) can be indicated as follows:

$$TMKBS = TM[TEC] = TM[TMIEC, TMAEC] \quad (3)$$

Expression 3 above tells us that the traditional market knowledge base structure (TMKBS) is supported by traditional economics thinking(TM[TEC]), both in terms of micro-economics and in macro-economics(TM[TMIEC, TMAEC]).

Here microeconomics theory and macroeconomic theory and growth theory are the proper tools to deal with traditional market issues. This knowledge base structure went unchallenged since 1776 when Adam Smith published “The Wealth of Nations” [5] until 1987 when the Brundtland Commission [6] criticized it; and it called for the need for sustainable development means to correct the way we handle social and environmental issues associated to development.

1.1.4 The production price structure of the traditional market(TM)

Since the traditional market(TM) is a for profit model where only the economic costs (ECM) at profits(i) matters, then its price structure can be expressed as follows:

$$TMP = P = ECM + i \quad (4)$$

Where P = the traditional market price (TMP), ECM = the economic margin, and i = profits.

Formula above simply says that the economic cost margin (ECM) at a profit (i) only determines the traditional market price (P). And therefore, the traditional market(TM) is a for profit economy based market [7].

1.1.5 The embedded market distortions in the traditional market(TM)

Since social externality costs(SM) and environmental externality costs (EM) associated to production are real, but they are not reflected in the pricing mechanism of the traditional market they become the two embedded distortions in the traditional market model, which makes social externality and environmental externality making a free cost activity. Because of these distortions we are moving towards sustainability backwards in terms of economic thinking [8] as these distortions have made it possible to produce and consume at lower prices encouraging over production and over consumption; and therefore these embedded distortions make traditional markets fully distorted markets [9].

1.1.6 The general nature of the traditional market model(TM)

In summary: The traditional market model: a) it is an economy only model(TM = aBc) that works under free perfect market thinking; b) It is based on rational independent choice; c) it is supported by traditional micro and traditional macroeconomics, d) it operates at economic profits as it covers only the economic cost of production(ECM) at a profit(i); and e) it has two embedded distortion, a social externality distortion and an environmental externality distortion. When this paradigm shifts then its model structure, its choice structure, its knowledge structure, and price structure all shift at the same time leaving the old structures behind [3]. And depending on the type of externality internalization that takes place the traditional market can shift to red markets if social margins are internalized [11]; it can shift to green markets if environmental margins are internalized [12]; and it can shift to sustainability markets if both social and environmental margins are internalized at the same time [13].

1.1.7 The perfect traditional market structure graphically

Fig. 1 shows in detail the structure of the traditional market together with its embedded distortions and associated sustainability gaps:

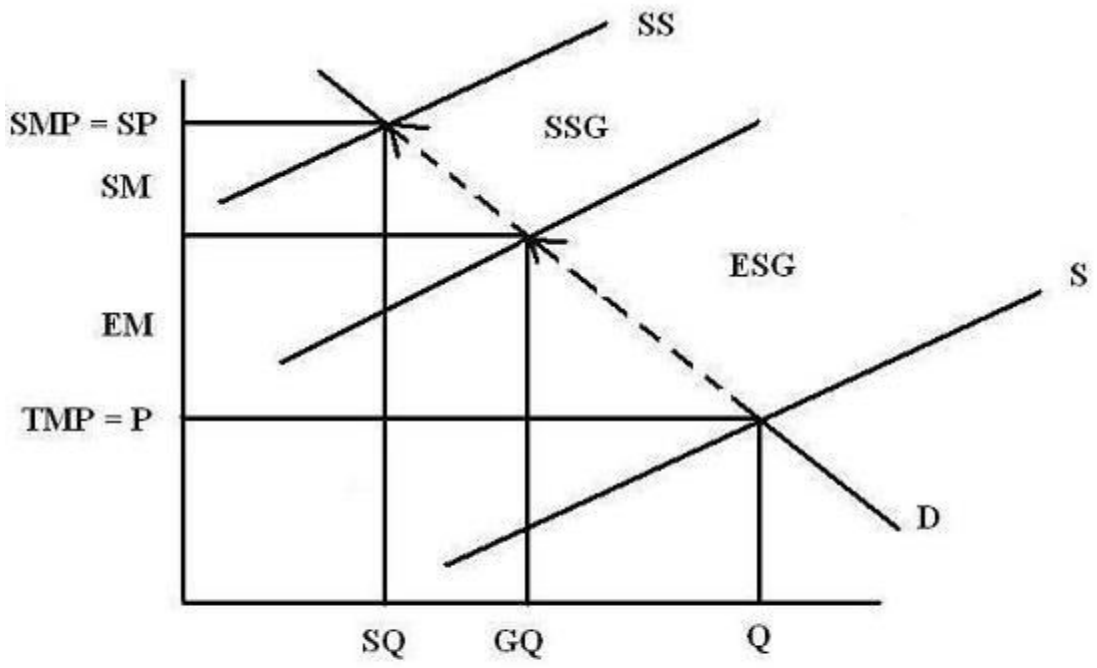

Fig. 1. **The fully distorted traditional market(TM): It has two embedded distortions, the social margin(SM) and the environmental margin(EM) creating associated social sustainability gaps(SSG) and environmental sustainability gaps(ESG).**

Fig. 1 above help us visualize the following: i) that the perfect market interaction is taking place at the point where traditional supply S meets traditional demand D at the traditional market price P and traditional quantify Q; and ii) that it is at this point of perfect market interaction that it is assumed that there is social (a) and environmental(c) externality neutrality and it is this assumption that makes the traditional market a fully distorted market. As social and environmental costs associated with production are real costs, then assuming them away leaves a social margin(SM) and an environmental margin(EM) outside the pricing mechanism of the traditional market creating a social sustainability gap(SSG) and an environmental sustainability gap(ESG) indicated by the broken arrow. Hence the sustainability gap (SG) between the traditional supply S and the sustainability market supply SS is equal to the sum of the environmental sustainability gap (ESG) and the social sustainability gap (SSG): SG = ESG + SSG. The traditional market has been called type I man-made market [8] because of its full externality assumption.

1.2 The Green Market (GM)

1.2.1 The model structure of the green market (GM)

When both the environment(C) and the economy (B) matter we have the green market (GM), which can be stated as follows:

$$GM = aBC \tag{5}$$

The expression above indicates that in the green market(GM), the society(a) exists only to meet the needs of the green market(GM) as only social issues(a) are considered externalities or factors exogenous to the green market model(GM); and therefore, here both the environment(C) and the economy(B) are the dominant and endogenous components only. Development only needs to be environment and economy friendly to be implemented. And hence, this is the world of the green

economic man, of the green invisible hand, and of green economic growth. This is the universe of the green economy. This is one of the worlds based on win-win or partnership based development thinking [10].

1.2.2 The choice structure of the green market (GM)

The perfect green market (GM) is a free market, based on rational codependent choice (RCC) in production (RCCP) and in consumption (RCCC). Hence the green market rational codependent choice structure (GMRCCS) can be stated as follows:

$$GMRCCS = GM[RCC] = GM[RCCP, RCCC] \quad (6)$$

Expression 6 above says that the green market rational codependent choice structure (GMRCCS) is determined by rational codependent choice thinking (GM[RCC]), both in production and in consumption (GM[RCCP, RCCC]).

Development here needs to be both environment and economy friendly at the same time to be implemented; and therefore the choice is not longer independent, but codependent. Codependent choice is at the heart of perfect green markets [12].

1.2.3 The knowledge base structure of the green market (GM)

The green market (GM) knowledge base is green economics (GEC) since green micro-economics (GMIEC) and green macro-economics (GMAEC) support the micro and macro components of the green economy respectively. Therefore, the green market knowledge base structure (GMKBS) can be indicated as follows:

$$GMKBS = GM[GEC] = GM[GMIEC, GMAEC) \quad (7)$$

Expression 7 above indicates that the green market knowledge base structure (GMKBS) is supported by green economics thinking(GM[GEC]), both in term of micro-economics and macro-economics (GM[GMIEC, GMAEC]).

The knowledge structure above should have been behind the setting up of green markets in 2012, but it was not there: The theory of the environmentally friendly firm and of the environmentally friendly consumer; and the theory of the environmentally friendly economy were not there at that time. And this may be one of the reasons why since 2012 the environmental crisis is being addressed outside green market thinking [14].

1.2.4 The production price structure of the green market (GM)

Since the green market(GM) is a for profit model where both the environmental costs(EM) and the economic costs (ECM) of production at profits(i) matters, then its price structure can be expressed as a correction of the traditional market model to make it environmentally friendly as follows:

$$GP = TMP + EM \quad (8)$$

Expression 8) above simply says that the green market price (GP) is the traditional market price (TMP) corrected by the externality margin (EM) needed to cover the cost of making production environmentally friendly.

Since TMP = P, the following is true:

$$GP = P + EM \quad (9)$$

Expression 9) tells us that the green market price (GP) is the for profit economy price (P) plus the environmental margin (EM).

Since P = ECM + i, then the following holds:

$$GP = ECM + i + EM \quad (10)$$

Expression 10) indicates that the green price (GP) is determined by the economic margin (ECM) plus the environmental margin (EM) at a profit (i).

And if we make the eco-economic margin (EEM) equals to the sum of the economic margin (ECM) and the environmental margin (EM), EEM = ECM + EM, then we get the following:

$$GP = EEM + i \quad (11)$$

Expression 11) shows that the green price (GP) is determined by the eco-economic margin (EEM) at a profit (i). And therefore the green price (GP) reflects the environmental cost of production (EM) and the economic cost of production (ECM) at a profit(i) as now the externality cost is internalized [7].

1.2.5 The embedded market distortions in the green market (GM)

Since social externality costs (SM) associated to green production are real, but they are not reflected in the pricing mechanism of the green market they become the only embedded distortions in the green market, which makes social externality making a free cost activity. It has been pointed out that eco-economic markets or green markets operate under social constraints as there are social limits to eco-economic growth [15]; and that closing their social sustainability gap through social externality cost internalization brings us into the world of sustainability markets [16].

1.2.6 The general nature of the green market model (GM)

In summary: The green market model: a) it is an environment and economy based partnership model(GM = BC) that works under free perfect market thinking, b) It is based on rational co-dependent choice; c) it is supported by green micro and green macroeconomics; d) it operates at green economy profits as it covers both the environmental costs(EM) and the economic costs(ECM) of production at a profit(i); and e) it has only one embedded distortion, a social externality distortion. And notice that if this green market paradigm shifts, its model structure, its choice structure, its knowledge structure, and price structure all shift at the same time leaving the old structures behind, having no choice but to take a sustainability market structure. It has been shown that if green markets shift they have only on possible destination when closing social sustainability gaps through social externality internalization, as last step [10], as last wave [4], which is the world of perfect sustainability markets [13].

1.2.7 The perfect green market structure graphically

Fig. 2 shares in detail the structure of the green market together with its embedded distortions and associated sustainability gaps:

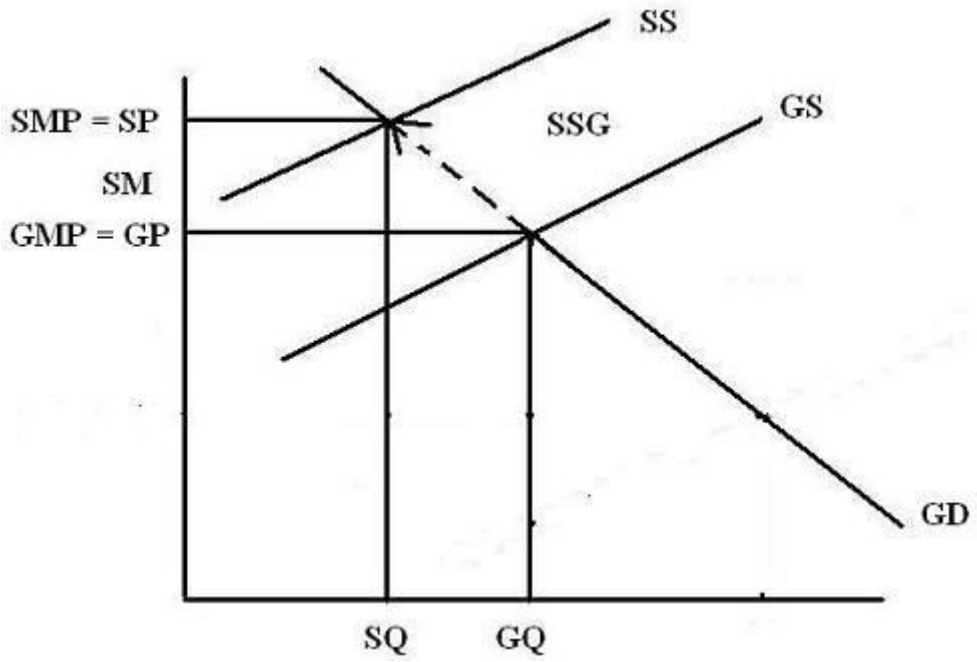

Fig. 2. The partially distorted green market price: It has only one embedded distortion, the social margin (SM) creating a social sustainability gap (SSG)

Fig. 2 above helps us to indicate the following: i) that the perfect green market interaction is taking place at the point where green supply GS meets green demand GD at the green market price GP and green quantify GQ; and ii) that it is at this point of perfect green market interaction where it is assumed that there is social (a) externality neutrality; and it is this assumption that makes the green market a partially distorted market. Notice that since social costs associated with green production are real costs, then assuming them away leaves a social margin(SM) outside the pricing mechanism of the green market creating a social sustainability gap(SSG) as indicated by the broken arrow. Hence the sustainability gap (SG) between the green supply GS and the sustainability market supply SS is equal to the social sustainability gap (SSG): SG = SSG. It has been pointed out that green markets are partially inclusive markets as now environmental issues as endogenous issues and that they are partially distorted markets as social margins are still out of the pricing mechanism [17].

1.3 Science Based Paradigm Shifts

Science based paradigm shifts must maintain the theory-practice consistency principle as when embedded distortions are corrected through externality cost internalization they shift from perfect market to perfect market [14]. As indicated above, a free market shifts to a free market, be it the free traditional market or be it the free green market to maintain the theory-practice consistency after the shift. And when perfect shifts take place, the model structure, the choice structure, the knowledge structure, and the production price structure of the previous paradigm all shift at the same time leaving the old structures behind and creating sustainability gaps. The whole supporting base of the old paradigm is left behind when a shift takes place [3], something that is consistent i) with paradigm death and shift expectations [18]; and ii) with cost externalization and new type of model structures [19], including the case of no cost externalization or full cost internalization that leads to the sustainability market [20]. And therefore, if instead of using externality cost internalization we use externality management to face the environmental crisis as in the case of the use of dwarf green markets then we are no longer within the science domain as any model who does not respect the theory-practice consistency principle is a non-science based model. In other words, if instead of correcting embedded environmental distortions in the market we take these distortions as environmental externality led market failures we are distorting the market even more. Since in 2012 Rio + 20 we shifted to green markets [21,22,23], an environmentally friendly idea welcomed and encouraged by different

stakeholders before and during the conference [24,25,26,27,28,29,30,31] and after the conference [32,33,34,35,36,37,38,39] and which is part of the sustainable development agenda [40, 41,42,43], then this raises an important question: "If going from free markets to free markets is the science based approach: What is then the model structure, price structure, choice structure and the knowledge structure and related gaps of the 2012 paradigm shift from perfect traditional market to perfect green market thinking?". The main goal of this paper is to provide an answer to this question.

2. OBJECTIVES

a) To highlight analytically the model structure, the choice structure, the knowledge structure, and the production price structure and associated gaps of the 2012 perfect paradigm shift to green markets; b) To highlight graphically the structure of the 2012 perfect paradigm shift to green markets; c) To highlight analytically and graphically that any traditional market placed below the perfect green market price is a dwarf green market as it falls inside the dwarf green market zone.

3. METHODOLOGY

First, the qualitative comparative terminology used in this paper is outlined. Second, merging rules and operational concepts are listed. Third, the 2012 perfect paradigm shift to green markets is analytically presented in detail. Fourth, the structure of 2012 perfect paradigm shift to green markets is highlighted graphically in detail. Fifth, the nature of the traditional market based dwarf green market zone under which dwarf green markets exist is shared analytically and graphically. And finally, some food for thoughts and relevant conclusions are given.

4. TERMINOLOGY

A = Dominant/active society	a = Dominated/passive society
B = Dominant/active economy	b = Dominated/passive economy
C = Dominant/active environment	c = Dominated/passive environment
S = Traditional supply	D = Traditional demand
P = Traditional market price	Q = Traditional market quantity
GP = Green market price	GS = Green market supply
GD = Green market demand	GQ = Green market quantity
SSG = Social sustainability gap	ESG = Environmental sustainability gap
SM = Social margin	EM = Environmental margin
ECM = Economic margin	EEC = Eco-economic margin
GMP = Green market price	TMP = Traditional market price
i = Profits	SMP = Sustainability market price
DGMZ = Dwarf green market zone	DGM = Dwarf green market

5. MERGING RULES AND OPERATIONAL CONCEPTS

5.1 Merging Rules

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

5.1.1 Merging under dominant-dominant interactions, under these conditions, dominant or active state prevails as indicated:

$$\mathbf{(AA) \rightarrow A \quad (BB) \rightarrow B \quad (AA)\,(BB) = (AB)(AB) \rightarrow AB}$$

5.1.2 Merging under dominated-dominated interactions, under these conditions, the dominated or passive form prevails as shown:

$$\mathbf{(aa) \rightarrow a \quad (bb) \rightarrow b \quad (aa)\,(bb) = (ab)(ab) \rightarrow ab}$$

5.1.3 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:

(Aa) → A (bB) → B (Aa) (bB) = (AB)(ab) → AB

5.1.4 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:

(Aa) → a (bB) → b (Aa) (bB) = (AB)(ab) → ab

5.2 Operational Concepts

5.2.1 Traditional market, *the economy only market*.

5.2.2 Green market, *the environmentally friendly market.*

5.2.3 Red market, *the socially friendly market*.

5.2.4 Sustainability market, *the socially and environmentally friendly market*.

5.2.5 Environmental or green margin, *to cover the extra cost of making the business environmentally friendly or to cover only the environmental cost of environmentally friendly production or to cover the environmental cost of red market production*.

5.2.6 Social margin, *to cover the extra cost of making the business socially friendly or to cover only the social cost of socially friendly production or to cover the cost of making green markets socially friendly or to cover the cost of making environment only models socially friendly.*

5.2.7 Economic margin, *to cover only the economic cost of production.*

5.2.8 Economic profit (i), *the incentive to encourage economic activity.*

5.2.9 Traditional market price, *general market for profit price (TMP = ECM + i = P).*

5.2.10 Green market price, *the for profit price that reflects both the economic and the environmental cost of production or the price that covers the cost of environmentally friendly production at a profit (GP = ECM + i + EM = P + EM)*.

5.2.11 Red market price, *the for profit price that reflects both the economic and the social cost of production or price that covers the cost of socially friendly production at a profit (RP = ECM + i + SM = P + SM)*.

5.2.12 Sustainability market price, *the for profit price that reflects the economic, social, and the environmental cost of production or the price that covers the cost of socially and environmentally friendly production at a profit(SP = ECM + i + SM + EM = P + SM + EM)*.

5.2.13 Green market knowledge gap, *the knowledge gap created by the paradigm shift from traditional markets to green markets or when correcting Adam Smith's model to reflect environmental concerns.*

5.2.14 Red market knowledge gap, *the knowledge gap created by the paradigm shift from red socialism to red markets or the knowledge gap created by correcting Adam Smith's traditional market to reflect social concerns.*

5.2.15 Sustainability market knowledge gap, *the knowledge gap created when any paradigm shifts towards sustainability, at once or step by step.*

5.2.16 Micro-economics, *the theory of the traditional firm and consumer.*

5.2.17 Macro-economics, *the theory of the traditional economy.*

5.2.18 Green micro-economics, *the theory of the environmentally responsible firm and consumer.*

5.2.19 Green macroeconomics, *the theory of the environmentally responsible economy.*

5.2.20 Red micro-economics, *the theory of the socially responsible firm and consumer.*

5.2.21 Red macro-economics, *the theory of the socially responsible economy.*

5.2.22 Sustainability market based micro-economics, *the theory of the socially and environmentally responsible firm and consumer.*

5.2.23 Sustainability based macro-economics, *the theory of the socially and environmentally responsible economy.*

5.2.24 Trickledown effect, *the expectation that traditional markets and growth will sooner or later benefit the poor.*

5.2.25 Green trickledown effect, the *expectation that green markets and green growth will sooner or later benefit the poor.*

5.2.26 Red trickledown effect, the *expectation that red markets and red growth will sooner or later benefit the environment.*

5.2.27 Deep paradigm, *a fully exclusive model (e.g. the traditional market).*

5.2.28 Partial partnership paradigm, *a partially inclusive model (e.g. the green market, the red market).*

5.2.29 Full partnership paradigms, *a fully inclusive model (e.g. the sustainability market).*

5.2.30 Externalities, *factors assumed exogenous to a model.*

5.2.31 Full externality assumption, *only one factor is the endogenous factor in the model, the others are exogenous factors.*

5.2.32 Partial externality assumption, *not all factors are endogenous factors at the same time in the model.*

5.2.33 No externality assumption, *all factors are endogenous factors at the same time in the model.*

5.2.34 Sustainability market cost margin (SMCM), *the sum of all cost margins in the sustainability market \price.*

5.2.35 Red market cost margin (RMCM), *the sum of all margins in the red market price.*

5.2.36 Green market cost margin (GMCM), *the sum of all margins in the green market price.*
5.2.37 Socio-environmental model cost margin (SENCM), *the sum of all margins in the socio-environmental model price.*

5.2.38 The dwarf market (DM), *a false market, a market unconnected to perfect market pricing, it looks like it is a specific market, but it is not.*

5.2.39 The dwarf market price (DP), *the price clearing the dwarf market.*

5.2.40 The dwarf quantity (DQ), *the inefficient quantity produced and consumed in dwarf markets*.

5.2.41 Dwarf market zone (DMZ), *the area where dwarf markets are or can be located.*

5.2.42 Dwarf green market (DGM), *any traditional market(TM) located below the perfect green market price (GP).*

5.2.43 Dwarf sustainability market (DSM), *any traditional market(TM) or any green market (GM) located below the perfect sustainability market price (SP).*

6. THE 2012 PERFECT PARADIGM SHIF TO GREEN MARKETS(GM) ANALYTICALLY

As indicated in the introduction in 2012 UNCSD/Rio + 20 conference the whole world went green market, green growth, and green economy, leaving the environmentally distorted traditional market model of Adam Smith behind. This was the perfect paradigm shift from perfect traditional markets to perfect green markets.

Below the structure of this 2012 perfect paradigm shift is described analytically from the model structure, the choice structure, the knowledge structure, and the production price structure point of view to have a systematic look of the shift and to point out the associated structural gaps created by the shift.

6.1 The Model Structure Shift

We know that the traditional market(TM = aBc) has an economy only friendly structure; and that the green market (GM = aBC) has an environment and economy friendly structure so the paradigm shift in terms of model structure can be stated as:

i) TM = aBc----------→ GM = aBC

Model structure gap

Formula i) above tells us that the structure of the traditional market(TM) shifts from an economy only model to an environment and economy model (GM). In other words the shift from traditional markets(TM) to green markets (GM) is shift from a dominant component based model to a partnership based model. And after the shift, a model structure gap is created meaning that the structure of the traditional market model(TM) no longer fits the reality of the green market model (GM); and therefore it is left behind.

6.2 The Choice Structure Shift

We know that the traditional market(TM) is based on rational independent choice (RIC); and that the green market (GM) is based on rational codependent choice (RCC) so the paradigm shift in terms of choice structure can be stated as:

ii) TM[RIC] = TM[RICP, RICC]----------→ GM[RCC] = GM[RCCP, RCCC]

Rational choice structure gap

Expression ii) above indicates that the choice structure of the traditional market(TM) shifts from a rational independent choice(RIC), both in production(RICP) and consumption(RICC) to rational codependent choice(RCC), both in production(RCCP) and in consumption(RCCC). In other words the choice structure of the traditional market(TM) shifts from dominant action to a co-dominant action as now only economic plans that are environmentally friendly are implemented. And after the shift, a choice structure gap is created meaning that the choice structure of the traditional market model(TM) no longer fits the reality of the green market model (GM); and therefore it is left behind.

6.3 The Knowledge Structure Shift

We know that the traditional market knowledge based structure (TMKBS) is traditional economics(TM[TEC]); and that the green market knowledge based structure (GMKBS) is green economics (GM[GEC]). Then the knowledge structure shift can be stated as follows:

iii) TM[TEC] = TM[TMIEC, TMAEC----------→ GM[GEC] = GM(GMMIEC, GMMAEC)

Knowledge structure gap

Expression iii) above tells us that the knowledge structure of the traditional market(TM) shifts from a traditional economics(TEC), both micro-economics(TMIEC) and macro-economics(TMAEC) to green economics(GEC), both green micro-economics(GMIEC) and green macro-economics(GMAEC). In other words the knowledge structure of the traditional market(TM) shifts from traditional economics to green economics as now only economic plans that are environmentally friendly are implemented. And after the shift, a knowledge structure gap is created meaning that the knowledge structure of the traditional market model(TM) no longer fits the reality of the green market model (GM); and therefore it is left behind.

6.4 The Price Structure Shift

We know that the traditional market model(TM) produces at pure economy profits only so TMP = P = ECM + i; and that the green market (GM) produces at green economy profits so GMP = GP = P + EM = ECM + i + EM. Therefore the paradigm shift in terms of price structure can be stated as:

iv) TMP = P = ECM + i ----------→ GMP = ECM + i + EM = P + EM

Production price structure gap

Expression iv) above indicates that the price structure of the traditional market(TM) shifts from pure economic pricing only (TMP) to green economic pricing (GMP). In other words the production pricing structure of the traditional market(TM) shifts from pure economic profits to green economy profits as now only production plans that are environmentally friendly are implemented. And after the shift, a production price structure gap is created meaning that the production price structure of the traditional market model(TM) no longer fits the reality of the green market model (GM); and therefore it is left behind.

7. THE 2O12 PERFECT PARADIGM SHIFT TO GREEN MARKETS(GM) GRAPHICALLY

Environmental cost internalization is the solution to eliminate the embedded environmental externality distortion in the traditional market model. In other words, when the perfect traditional market(TM) is corrected by adding an environmental margin (EM) to the traditional market price (TMP) to close its environmental sustainability gap (ESG) it shifts to perfect green markets (GM) as indicated below:

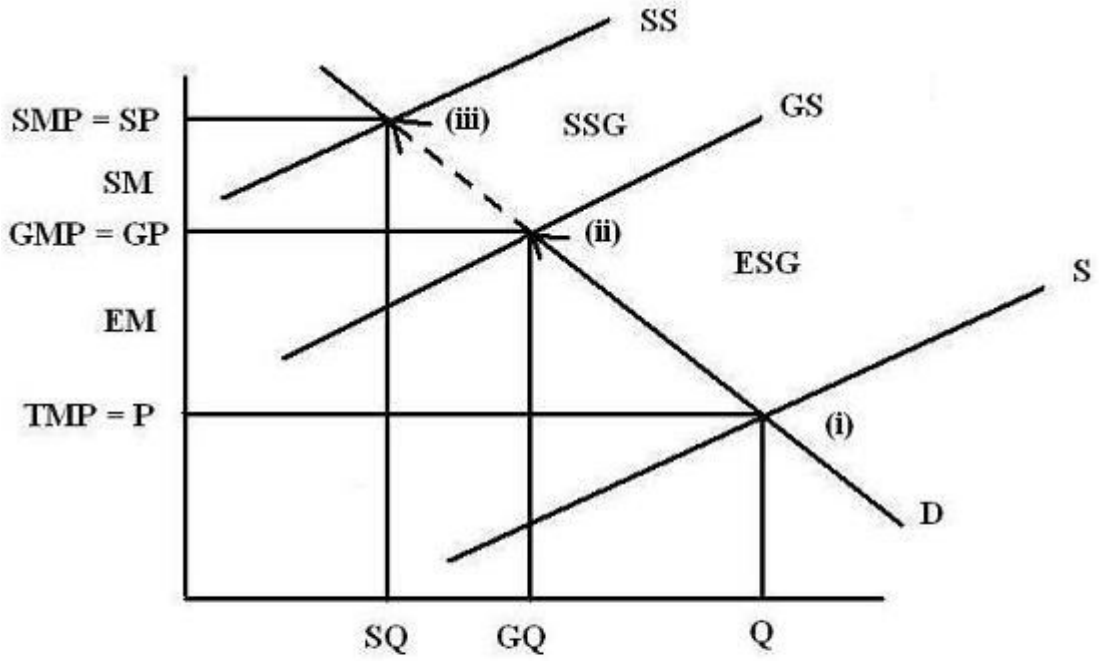

Fig. 3. **The structure of the 2012 shift from perfect traditional market(TM) to perfect green market(GM): When the enviromental externality(EM) is internalized in the price mechanism of traditional markets(TM) it closes its environmental sustainability gap(ESG) and the traditional supply S shift from point (i) to point (ii) and it becomes the green market supply GS. Notice that the GMP = GP = TMP + EM = P + EM**

Fig. 3 simply says that to close the environmental sustainability gap (ESG) affecting the traditional market(TM) we need to add an environmental margin (EM) to the traditional market price (TMP) to shift the traditional supply(S) to the left from point (i) to point (ii) and transform it into the green market supply (GS) cleared at the green market price GP. In other words, the necessary and sufficient condition for the paradigm shift from the perfect market to green markets to take place is environmental cost internalization as when the environmental margin (EM) is added to the traditional market price (P) the traditional market(TM) shift from point (i) to point (ii) becoming a perfect green market (GM).

You can also notice in Fig. 3 the following: a) that the gap between the traditional supply S and green supply GS is equal to the environmental sustainability gap (ESG); and b) that the gap between traditional price P and the green price GP is the environmental margin (EM). And finally Fig. 3 can be used to stress the following: a) that the green market(GM) still operates under a social sustainability gap(SSG) as the social margin(SM) is left out of the pricing mechanism of green markets as indicated by the broken arrow going from point (ii) to point (iii); b) that the model structure, the choice structure, the knowledge structure, and the production price structure existing at point (i) all no longer works at point (ii); and c) that when you shift from point (i) to point (ii) all of those structures are left behind as they no longer work the under perfect green market thinking that rules at point (ii). Hence, the structure of the green market in Fig. 3 is the science based tool, the proper tool that needs to be used to properly address the environmental crisis.

8. THE TRADITIONAL MARKET BASED DWARF GREEN MARKET ZONE

When instead of using environmental cost internalization to correct a distorted traditional market pricing mechanism we use externality management we are actually distorting the traditional market even more. And the reason is that to avoid environmental cost internalization they are using non-green market

approaches or dwarf green markets that still are operating under an active environmental sustainability gap (ESG). Any traditional market placed below the perfect green market price (GP) is a dwarf green market (DGM), which can be appreciated graphically in Fig. 4 below:

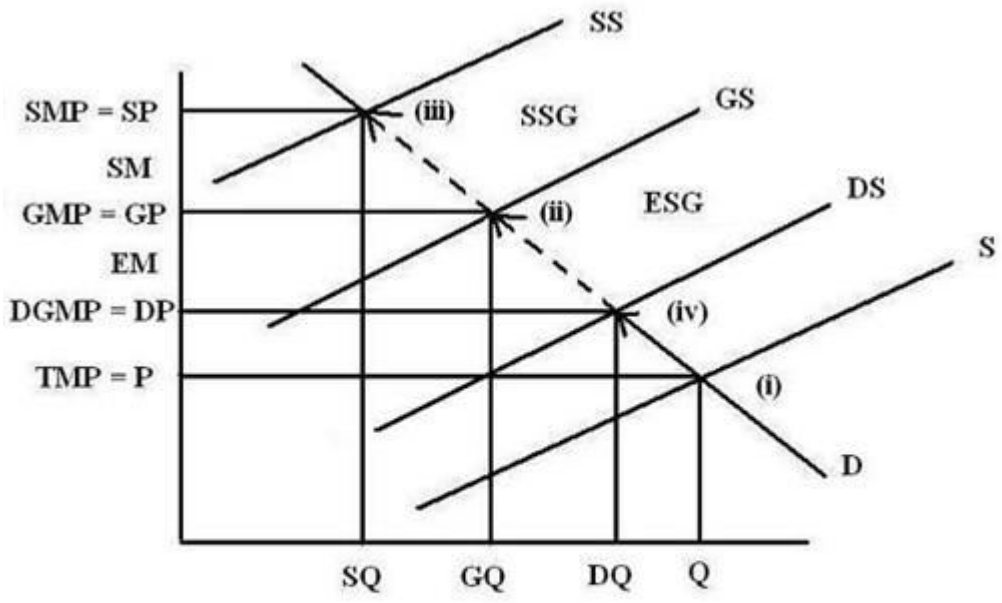

Fig. 4. **The dwarf green market zone(DGMZ): Any traditional market placed below the perfect green market price(GP) is a dwarf green market(DGM) operating still under an environmental sustainability gap(ESG) as it is treating environmental costs as externalities not as endogenous issues. See that P < DP < GP so that DQ > GQ.**

We can use Fig. 4 above to point out a) that there is a dwarf green market(DGM) at point (iv) where the dwarf green market price DP clears the dwarf supply DS at the dwarf quantity DQ; and b) that the distance between point (i) or traditional supply S and point (ii) or green supply GS is the dwarf green market zone(DGMZ) as any market with price below the green market price GP is a dwarf green market with similar structure as the one at point (iv).

We can also used Fig. 4 above to stress the following about dwarf green markets such as the one at point (iv): a) that they are not green markets as they are not cleared by the green market price; b) that they still operate under an environmental sustainability gap(ESG) as indicated by the broken arrow from point (iv) to point (ii) as not all the environmental cost(EM) is accounted for; and c) that they operate under a social sustainability gap(SSG) as indicated by the broken arrow from point (ii) to point (iii) as the social margin(SM) is left out of the pricing mechanism of dwarf green markets(DGM).
Finally we can used Fig. 4 above to highlight these aspects: a) that a shift from point (i) or traditional market(TM) to point (iv) or dwarf green market(DGM) is a shift from a free market thinking based model, the traditional market model, to a non-free market thinking based model, the dwarf green market model; and this move from free to non-free markets highlights a serious paradigm shift inconsistency in terms of model, choice, knowledge base, and production pricing structures as at point (iv) there are no green producers and green consumers and there are no traditional producers and traditional consumers. In other words the model structure, the choice structure, the knowledge based structure, and the production pricing structures of the perfect green market(GM) at point (ii); and of the perfect traditional market(TM) at point (i) do not work at point (iv) or dwarf green markets(DGM) as those dwarf green markets fall outside rational free market thinking and choices, the economic man and its traditional invisible hand and the green economic man and its green invisible hand are left out of dwarf green market thinking. The world of dwarf green markets is the world of non-science based markets. Hence, the structure of the dwarf green market in Fig. 4 is a non-science based tool, a non-free imperfect

market; and therefore, it is not the appropriate tool to use to address the environmental crisis or green market issues.

9. FOOD FOR THOUGHTS

a) If the cause of the environmental crisis is an environmentally distorted traditional market price, why to focus our attention on managing the consequence and not on eliminating the cause?, what do you think?; b) Should the carbon sequestration business be expected to balloon under environmental externality management or dwarf green markets?, I think yes, what do you think?; c) Do dwarf green markets implementation lead to a minimum carbon based economy?. I say no, what do you think?; d) Should the development goal be minimum emission based economies?, I say no, what do you think?; and e) Is dwarf green markets are being used to implement a climate change agenda, is that scientific inconsistency?, I think yes, what do you think?

10. CONCLUSIONS

First, it was pointed out that free, perfect markets shift from free, perfect markets to free, perfect markets to respect the theory-practice consistency principle and remain science based. Second, it was highlighted that the necessary and sufficient conditions for perfect paradigm shift to take place is externality cost internalization. Third, it was stressed that when the shift from perfect traditional market to perfect green market took place in 2012 the model structure, the choice structure, the knowledge base structure, and the producing price structure, all shifted at the same time, leaving the old structures of the traditional market behind as traditional market ideas no longer fit the reality in green markets. Fourth, it was indicated that the proper science based tool to deal with the environmental crisis are green markets, the world of green producers and green consumers. And finally, it was shown that dwarf green markets are non-science based, non-free, non-perfect markets; and therefore there are the wrong tools to use if we are serious about properly addressing the environmental crisis.

COMPETING INTERESTS

Author has declared that no competing interests exist.

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This chapter is an extended version of the article published by the same author(s) in the following journal.
International Journal of Scientific Research (IJSR), II(1): 20-37, 2017.

Citation:

Muñoz, Lucio, 2021. **If Going From Free Markets to Free Markets Is the Science Based Approach: What is Then the Model Structure, Price Structure, Choice Structure and the Knowledge Structure and Related Gaps of the 2012 Paradigm Shift From Perfect Traditional Market to Perfect Green Market Thinking?,** In: ***Insights into Economics and Management*** ,Vol. 5, Chapter 1, Pp 1-17, Book Publisher International, January 21, ISBN: 978-93-90516-50-6 (Print), ISBN: 978-93-90516-51-3(eBook), London, UK.

https://bp.bookpi.org/index.php/bpi/catalog/book/377

10.9734/bpi/ieam/v5

https://doi.org/10.9734/bpi/ieam/v5