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From Traditional Markets to Green Markets: A Look at Markets Under Perfect Green Market Competition

By

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Abstract

Perfect market competition is at the heart of traditional market thinking. So when perfect markets shift, our thinking should perfectly shift too in order to be able to operate in the new perfect market, this is true whether we shift towards a green market or a red market or a sustainability market. For example the 2012 Rio + 20 conference chose to correct the traditional market to account for the environmental cost of doing business only; and therefore they chose a shift from perfect traditional market thinking to perfect green market thinking. And this indicated the need to understand the expected behavior of markets under perfect green market competition, yet nothing seems to have been written to my knowledge since 2012 about short term and long term perfect green market competition. The main goal of this paper is to point out how markets should be expected to work under perfect green market competition.

Key concepts

Traditional markets, green markets, perfect market competition, perfect green market competition, market shifts, red markets, sustainability markets, green producers, green consumers, short term costs, short term green market costs, long term costs, long term green market costs.

Introduction

a) Core aspects of perfect market competition

To be able to present the ideas in this paper you will find below a presentation in simple terms of relevant general aspects associated with perfect market thinking and competition such as the nature of its assumptions, the structure of the model, the short term cost structure, and the long term cost structure of the perfect market.

i) Some basic traditional perfect market assumptions

Six of the basic assumptions of perfect market competition relate to the type of products, to the type of transaction costs, to the type of entry, to the type of information, to the type market power, and to the type of profit seeking behavior under which the perfect market operates. These assumptions are summarized in Figure 1 below:

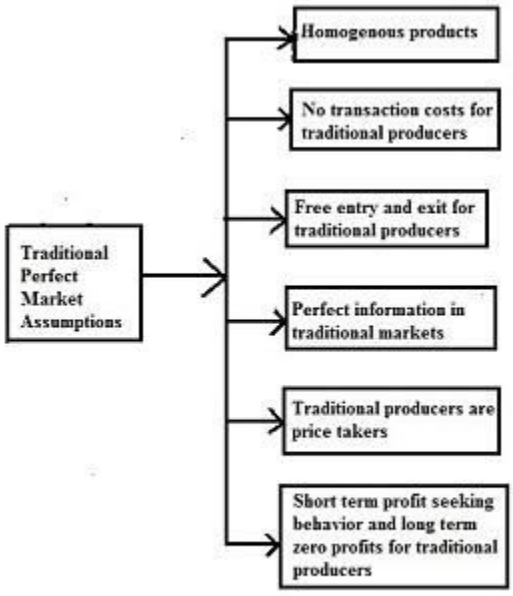

Figure 1 Perfect traditional market assumptions

Figure 1 above shows the core assumptions under with perfect markets and perfect market competition operates, many producers under a perfect market setting, perfect substitutes, and perfectly elastic demand, none of them with production capable of affecting the market. Hence, this is the world of traditional producers and traditional consumers under free markets as no government intervention is needed, the world of the economic man.

ii) The perfect traditional market structure

It is known that the perfect traditional market(TM) is the one where the traditional supply((S) and the traditional demand(D) interact to determine the perfect market price(TMP = P) and the perfect market quantity(TMQ = Q) to be consumed and produced, which is indicated graphically below:

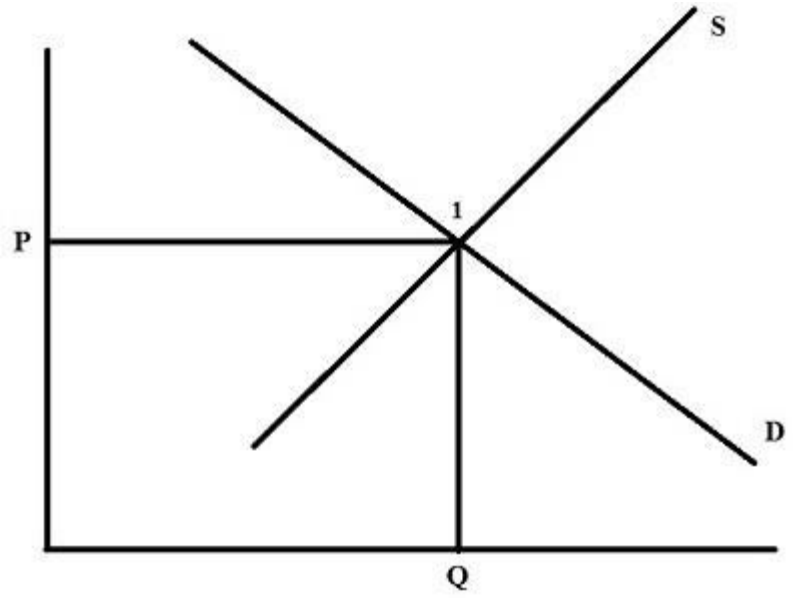

Figure 2 The structue of the perfect traditional market

We can see in Figure 2 above that at point 1 the traditional supply(S) and traditional demand(D) determine the traditional market price(TMP = P) and the traditional quantity(TMQ = Q). We can also see in Figure 2 above that the choice structure here relates to independent economic only choices, as only the economy matters. This is because the traditional market(TM) assumes social(a) and environmental(c) externality neutrality so its structure is TM = aBc. The environment issue(c) here is an exogenous issue and Pareto optimality holds as no one can be better off or worse off.

And therefore, the price structure of the perfect traditional market(TMP) at Q can be stated as follows:

1) TMP = P

iii) The perfect market short term cost structure under perfect competition

The following can be said about traditional perfect market competition in the short term: a) production(Q) is kept at the point where the marginal revenue(MR) equals the marginal cost(MC), MR = MC; b) where the traditional market price(TMP = P) equals the average revenue(AR), TMP = P = AR; and c) depending on the price(P) position related to the average total cost(ATC), profit can be negative, positive or zero, a situation simplified graphically in Figure 3 below:

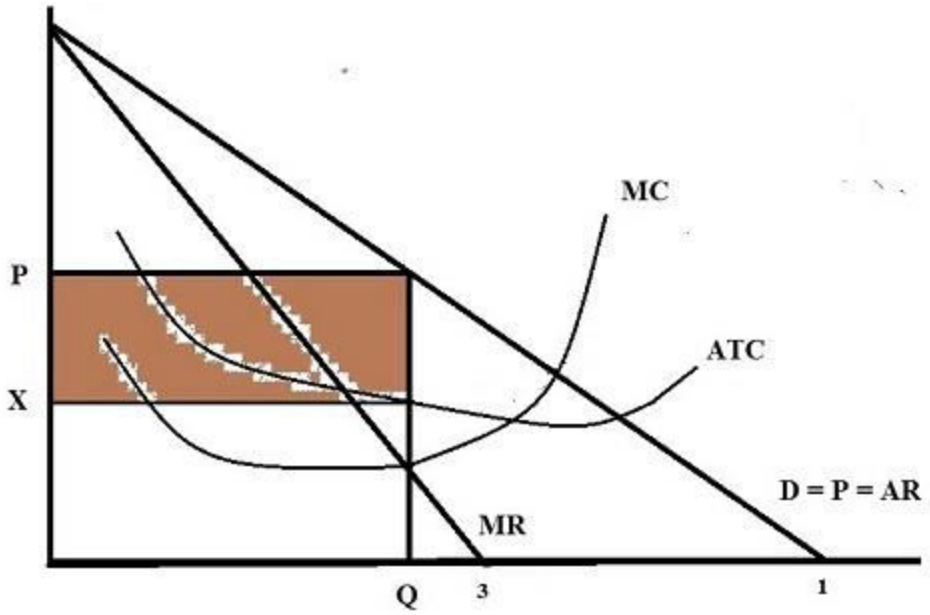

Figure 3 The short run traditional market cost structure under perfect market competition

Figure 3 above summarizes the short term cost environment under which perfect traditional market competition takes place.

And based on Figure 3 above we can express the short term price structure of the perfect market at Q as follows:

2) TMP = P = AR

Notice that in the short term under perfect market competition as reflected in Figure 3 above: a) firms can make positive profits if P > ATC, then new entries will keep coming in and bring the profit down towards zero; b) firms can make zero profit if P = X = ATC and as long as that is true they will remain in the market; and c) firms can make negative profits if P < ATC, then those firms will exit the market leading to an increase in P and then profit will rise until it becomes zero.

iv) The perfect market long term cost structure under perfect competition

The following aspects can be highlighted about the traditional perfect market competition in the long term: a) production(Q) is kept at the point where the marginal revenue(MR) equals the marginal cost(MC) equals the average total cost(ATC), MR = MC = ATC; b) where the traditional market price(TMP = P) equals the average revenue(AR) equals the marginal cost(MC), TMP = P = AR = MC; and c) therefore, here profit is always zero since the traditional price(TMP = P) is equal to the average total cost(ATC), TMP = P = ATC, a situation highlighted graphically in Figure 4 below:

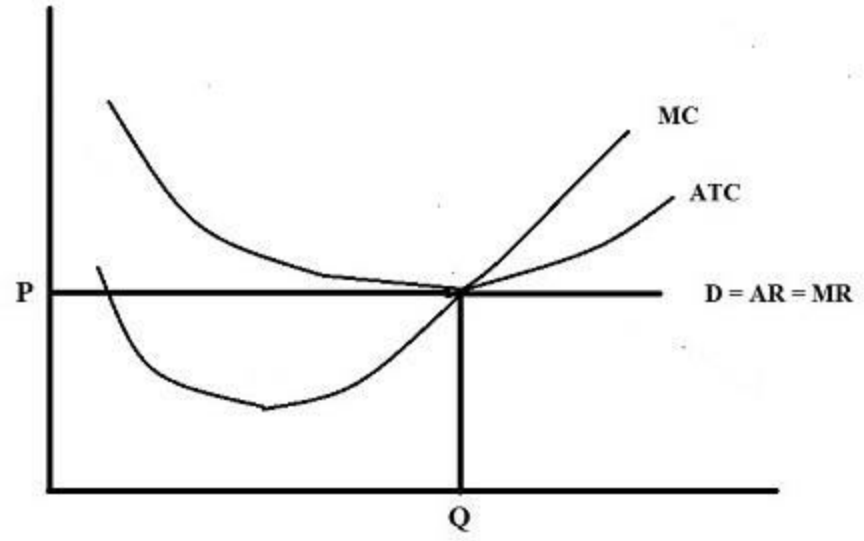

Figure 4 The perfect traditional market long run cost structure under perfect market competition

Figure 4 above highlights the long term cost environment under which perfect market competition operates, where the demand(D) touches the minimum point of the average total cost(ATC).

And based in Figure 4 above we can express the long term price structure of the perfect market at Q as follows:

3) TMP = P = AR = ATC

Notice in Figure 4 above that firms selling at P are operating at zero profits as P = ATC. And we expect that under perfect market competition all firms will operate at zero profits in the long term.

b) The core implications of paradigm shift

Perfect market competition is at the heart of traditional market thinking. So when perfect markets shift, our thinking should perfectly shift too in order to be able to operate in the new perfect market, this is true whether we shift towards a green market(Muñoz 2016a) or a red market(Muñoz 2016b) or a sustainability market(Muñoz 2016c). When there is a paradigm shift, the model structure, the choice structure, the nature of trickle downs, and the price structure shift at the same time, including its cost structure and revenue structure. This is because perfect paradigm shifts, such as the shift from a perfect market to another perfect market maintain optimal higher level conditions and expectations when the cost of being environmentally friendly is internalized in the pricing mechanism of the traditional market(Muñoz 2016d).

c) The 2012 shift to perfect green markets

In 1987 the Brundtland Commission called for correcting the traditional business model to account for both social and environmental concerns so we can go beyond traditional business practices(WCED 1987). This led to a sustainable development process that culminated in 2012 at the Rio +20 conference on sustainable development, where a green development path was

endorsed(UNCSD 2012a; 2012b) even though it was not the only option that existed(Muñoz 2016e). Hence, the 2012 Rio + 20 conference chose to correct the traditional market to account for the environmental cost of doing business only in order to go green; and therefore it chose a shift from perfect traditional market thinking to perfect green market thinking. Interest in green economic thinking to correct the traditional market model grew since then(WB 2012; UNDESA 2012; WB 2013; UNECA 2016), giving meaning to a view shared in 2012 that we indeed were approaching sustainability backwards in terms of economic thinking(Muñoz 2012) as Adam Smith left relevant externality costs out of the pricing mechanism of the traditional market(Muñoz 2015). And this indicated the need to understand the expected behavior of markets under perfect green market competition, a need that appears more pressing now that global plans are being considered in terms of implementing global green markets(WGEO 2018) and in terms of linking the global economy and climate change(GCEC 2018), yet nothing seems to have been written to my knowledge since 2012 about short term and long term perfect green market competition or the theory of the green firm or the theory of the green consumer or the theory of the environmentally friendly economy. The main goal of this paper is to point out how markets should be expected to work under perfect green market competition.

Objectives

a) To highlight the structure of the shift from traditional perfect markets to perfect green markets in terms of assumptions, general market structure, short term cost structure and long term cost structure; and b) to stress the implications of that shift in terms of perfect green market competition.

Methodology

First, the terminology used in this paper is shared. Second, the operational concepts are given. Third, the structure of the perfect shift from traditional market assumptions to the perfect green market assumptions is stressed. Fourth, the basic assumptions of the perfect green market are highlighted. Fifth, the shift of the model structure from perfect traditional market to the perfect green market is pointed out. Sixth, the structure of the perfect green market is shown. Seventh, the shift from the perfect traditional market short term cost structure to the perfect green market short term cost structure is indicated.

Eighth, the structure of the perfect green market short term cost structure under perfect green market competition is described. Ninth, the shift from the perfect traditional market long term cost structure to the perfect green market long term cost structure is presented. Tenth, the structure of the perfect green market long term cost structure under perfect green market competition is discussed. Eleventh, a summary, implications and food for thoughts are listed. And finally, some specific and general conclusions are provided.

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

GS = Green supply GD = Green demand

P = Traditional market price GP = Green market price

Q = Traditional market quantity GQ = Green market quantity

EE = Environmental externality EM = Green margin

TMP = Traditional market price GMP = Green market price

AR = Average revenue GAR = Green average revenue

ATC = Average total cost GATC = Green average total cost

MC = Marginal cost GMC = Green marginal cost

MR = Marginal revenue GMR = Green marginal revenue

Operational concepts

i) Traditional market, *the economy only market.*

ii) Green market, *the environmentally friendly market.*

iii) Sustainability market, *the socially and environmentally friendly market.*

iv) Traditional market price, *general market economic only price or the price that covers the cost of production.*

v) 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.*

vi) Sustainability market price, *the 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.*

vii) Green market knowledge gap, *the knowledge gap created by the paradigm shift from traditional markets to green markets.*

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

ix) Green macroeconomics, *the theory of the environmentally responsible economy.*

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

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

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

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

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

xv) Externalities, *factors assumed exogenous to a model.*

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

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

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

xix) Green margin, *to cover the extra cost of making the business environmentally friendly.*

xx) Social margin, *to cover the extra cost of making the green business socially friendly or of making the traditional market socially friendly.*

xxi) Perfect market competition, *the expected behavior of firms and consumers in the short and long term under perfect market thinking.*

xxii) Perfect green market competition*, the expected behavior of green firms and green consumers in the short and long term under perfect green market thinking.*

xxiii) Market shift, *a move from one market paradigm to another market paradigm.*

xxiv) Perfect market shift*, a move from one perfect market paradigm to another perfect market paradigm.*

xxv) Red markets, *the socially friendly markets*

The structure of the perfect shift from traditional market to the perfect green market assumptions

We can think of a shift from a perfect market to another perfect market as bringing each assumption of the previous model to a higher responsibility level model, a move from exclusion to inclusion as indicated in Figure 5 below:

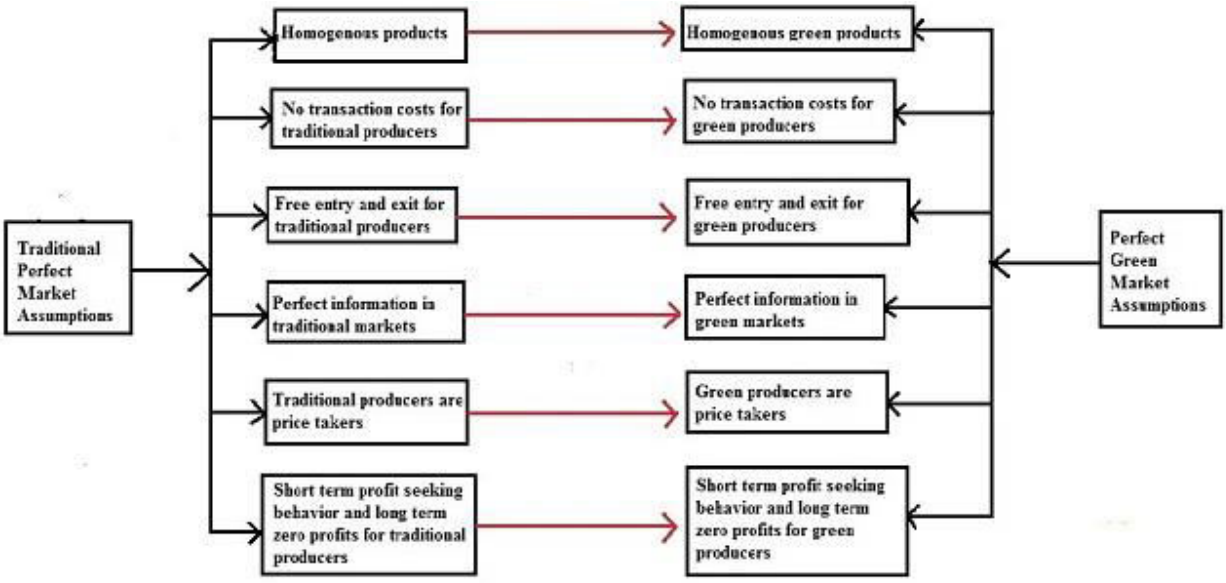

Figure 5 The perfect shift from traditional market assumptions to green market assumptions

The structure in Figure 5 above shows in detail the greening of traditional market to transform it into a green market, a move from only the economy matters to a world where both the economy and the environment matter.

The basic assumptions of the perfect green market

Consistent with the shift structure in Figure 5 above we can can stress the perfect green market assumptions as listed in Figure 6 below:

Figure 6 The perfect green market assumptions

The assumptions summarized in Figure 6 above provide the environment under which perfect green markets operate, many green producers under a perfect green market setting, perfect green substitutes, perfectly elastic green demand, none of them with green production capable of affecting the green market. Hence, this is the world of green producers and green consumers under free green markets as no government intervention is needed, the world of the green economic man.

The model structure shift from perfect traditional market to the perfect green market

When the perfect traditional market price(TMP) depicted in Figure 2 above is corrected to reflect the cost of being environmentally friendly the traditional market model structure(TM) shifts from an economy only model to an economy and environment model, a model now cleared by a green price(GP). In other words, the internalization of the environmental cost or green margin(EM) in the pricing mechanism of the traditional market(TMP) shifts the traditional price structure P towards the green price structure GP as indicated analytically below:

4) TMP + EM = GP = P + EM, and therefore, GP > P

And the price structure shift towards a higher price GP indicated above shifts the traditional supply S towards the green supply GS as represented graphically in Figure 7 below:

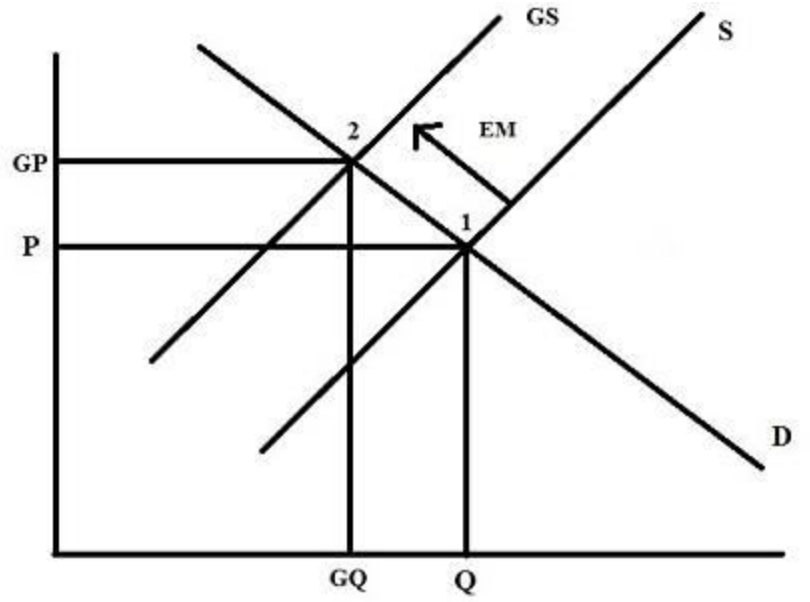

Figure 7 The structure of the perfect shift from traditional markets to green markets

Figure 7 above summarizes the structure of the shift from perfect traditional markets(TM) to perfect green markets(GM), where GP > P, GQ < Q and where GP – P = EM.

The structure of the perfect green market

As indicated at point 2 in Figure 7 above, the perfect green market(GM) is the one where the green supply((GS) and the green demand(GD) interact to determine the perfect green market price(GMP = GP) and the perfect green market quantity(GMQ = GQ) to be consumed and produced, a situation highlighted graphically below:

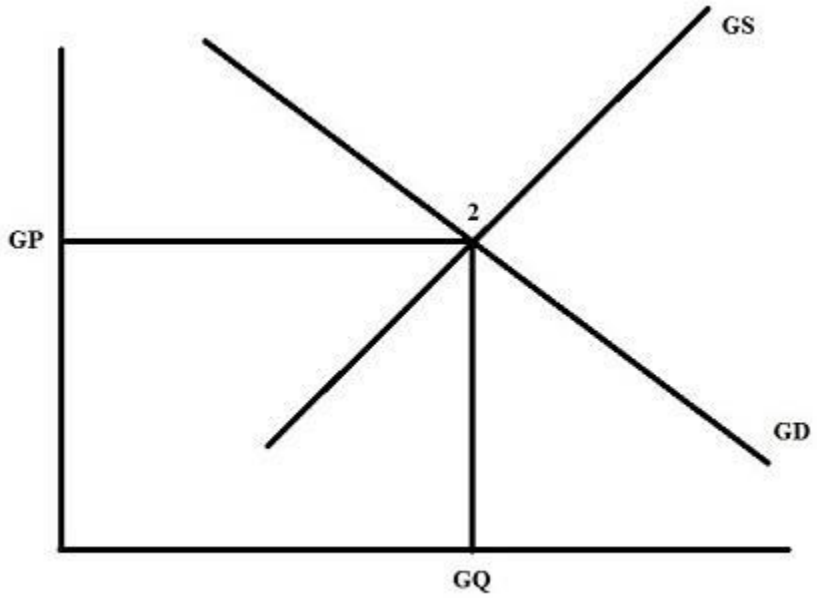

Figure 8 The structure of the perfect green market

We can see in Figure 8 above that at point 2 the green supply(GS) and green demand(GD) determine the green market price(GMP = GP) and the green quantity(GMQ = GQ). We can also see now in Figure 8 above that the choice structure has shifted from independent economy only choices shown in Figure 2 above to codependent eco-economic or green choices, as now both the economy and environment matter. This is because the green market(GM) assumes only social externality neutrality so its structure is GM = aBC. The environment issue(C) here now is an endogenous issue and green Pareto optimality holds as no one can be better off or worse off.

And therefore, the price structure of the perfect green market at GQ can be stated as. follows:

5) GP = TMP + EM = P + EM

And the formula 5 above tells us that the price structure of the perfect traditional market(TMP) has shifted to the price structure of the perfect green market(GMP) shifting also in the process the short term and long term cost and revenue structures of the perfect traditional market as it is shown below in detail:

The shift from the perfect traditional market short term cost structure to the perfect green market short term cost structure

When the traditional market price(TMP) is corrected to internalize the environmental margin(EM) to make it environmentally friendly the traditional short term cost structured depicted in Figure 3 above shifts towards that of green market short term cost structure as indicated in Figure 9 below:

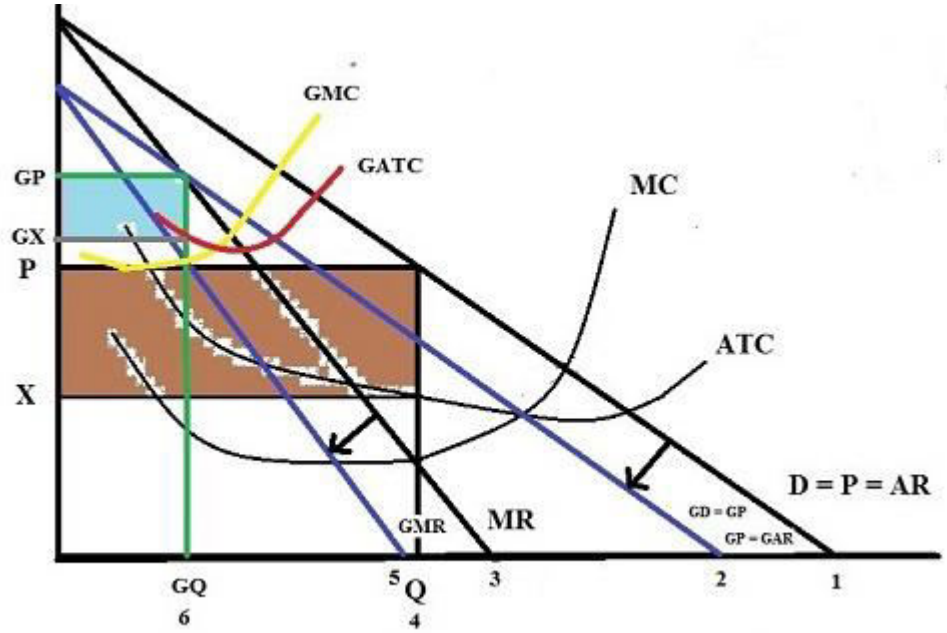

Figure 9 The perfect shift from traditional market short term cost structure to that of the perfect green market

Figure 9 above tells us the following when we shift from the traditional market short term cost structure to the green market short term cost structure: a) The demand shifts down as less is demanded at a higher price GP from point 1 where the traditional market demand(D) is to point 2 where the green demand(GD) is; b) The marginal revenue shifts down from point 3 where the traditional marginal revenue(MR) is to point 5 where the green marginal revenue(GMR) is; and c) the contraction of traditional demand(D) and traditional marginal revenue(MR) shifts the traditional short term cost structure up to the left from traditional marginal cost(MC) to green marginal cost(GMC) and from traditional average total cost(ATC) to green average total cost(GATC).

Figure 9 above also shows that profit seeking exist in both in traditional markets and in green markets as indicated by the colored rectangles associated with each perfect market at point 4 and at point 5 respectively.

The structure of the perfect green market short term cost under perfect green market competition

Based on the shift structure in Figure 9 above the following can be said about perfect green market competition in the short term: a) green production(GQ) is kept at the point where the green marginal revenue(GMR) equals the green marginal cost(GMC), GMR = GMC; b) where the green market price(GMP = GP) equals the green average revenue(GAR), GMP = GP = GAR; and c) depending on the green price(GP) position related to the green average total cost(GATC), green profit can be negative, positive or zero, a situation simplified graphically in Figure 10 below:

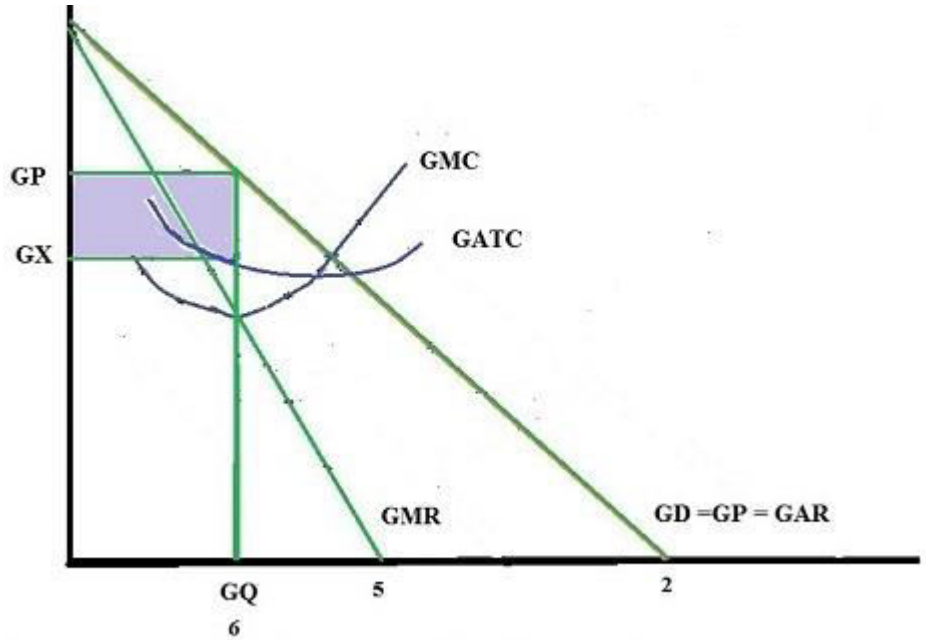

Figure 10 The green market short term cost structure under perfect green market competition

Figure 10 above summarizes the short term cost environment under which perfect green market competition takes place.

And based on Figure 10 above we can express the short term green price structure of the perfect green market at GQ as follows:

6) GMP = GP = GAR

Notice that in the short term under perfect green market competition as reflected in Figure 10 above: a) green firms can make positive green profits if GP > GATC, then new entries will keep coming in and bring the green profit down towards zero; b) green firms can make zero green profit if GP = GX = GATC and as long as that is true they will remain in the green market; and c) green firms can make negative green profits if GP < GATC, then those green firms will exit the green market leading to an increase in GP and then green profit will rise until it becomes zero.

The shift from the perfect traditional market long term cost structure to the perfect green market long term cost structure

When the traditional market price(TMP) is corrected to internalize the environmental margin(EM) to make it environmentally friendly the traditional long term cost structured depicted in Figure 4 above shifts to that of the long term cost structure of perfect green markets as indicated in Figure 11 below:

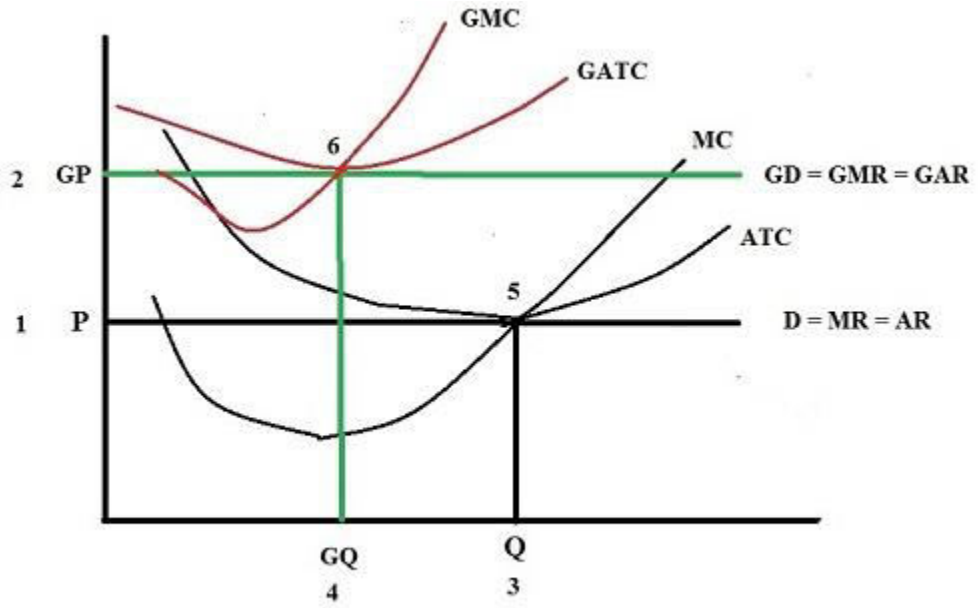

Figure 11 The perfect shift from the traditional market long term cost structure to that of the perfect green market

Figure 11 above tells us the following when we shift from the traditional market long term cost structure to the green market long term cost structure: a) the price structure shifts up from P to GP as GP > P; b) the quantity consume falls from Q at point 3 to GQ at point 4 due to the higher GP; c) The traditional demand(D) at point 1 shifts up to the green demand(GD) at point 2; and d) The traditional market(TM) long term cost structure at point 5 shift up to the left to point 6 where the green market(GM) long term cost structure is.

Figure 11 above also shows that in both perfect markets zero profit prevails in the long term as it can be seen at point 5(P = ATC) and at point 6(GP = GATC).

The structure of the perfect green market long term cost structure under perfect green market competition

Consistent with Figure 11 above, the following aspects can be highlighted about the perfect green market competition in the long term: a) green production(GQ) is kept at the point where the green marginal revenue(GMR) equals the green marginal cost(GMC) equals the green average total cost(GATC), GMR = GMC = GATC; b) where the green market price(GMP = GP) equals the green average revenue(GAR) equals the green marginal cost(GMC), GMP = GP = GAR = GMC; and c) therefore, here green profit is always zero since the green market price(GMP = GP) is equal to the green average total cost(GATC), GMP = GP = GATC, a situation highlighted graphically in Figure 12 below:

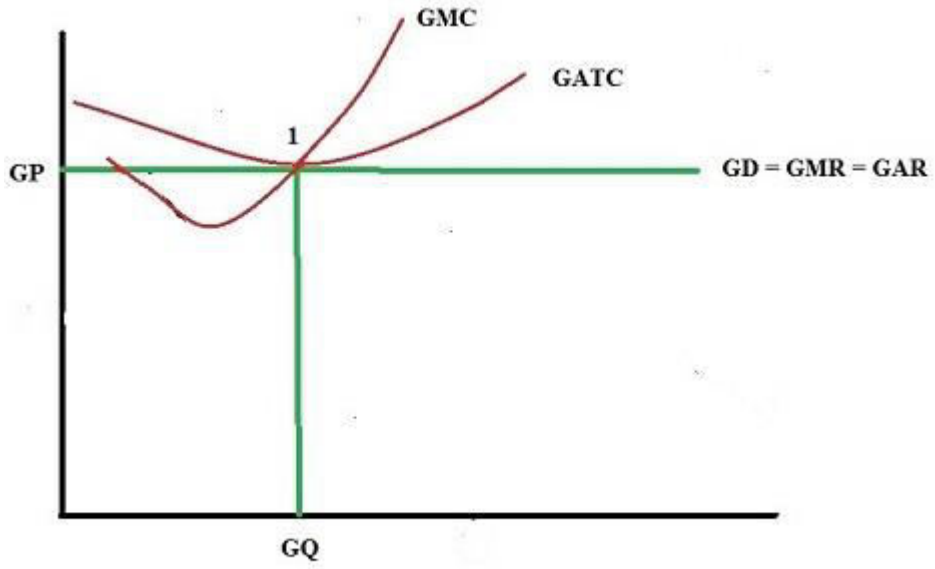

Figure 12 The green market long term cost structure under perfect green market competition

Figure 12 above highlights the long term cost environment under which perfect green market competition operates, where the green demand(GD) touches the minimum point of the green average total cost(GATC).

And based on Figure 12 above we can express the long term green price structure of the perfect green market at GQ as follows:

7) GP = GAR = GATC

Notice in Figure 12 above that green firms selling at GP are operating at zero green profits as GP = GATC. And we expect that under perfect green market competition all green firms will operate at zero green profits in the long term.

Summary:

The shift from one perfect market to another can be seen as a systematic evolution in assumptions, model structure, and cost and revenue structures as shown above. Correcting the traditional market's pricing mechanism to reflect the cost of being environmentally friendly leads to a shift to the green world, where markets are cleared by the green market price; and where green producers and consumers respond to green market price signals guiding the working of perfect green market competition.

Implications:

The expected behavior of green consumers and green producers is different than the expected behavior of traditional consumers and producers as they would not be interested in consuming and producing goods and services that are not environmentally friendly. By greening traditional market assumptions, model, and cost structures we create the conditions needed for green producers and consumers to work under perfect green market competition, a world that falls under green micro-economic and green macro-economic thinking.

Food for thoughts

1) Does perfect traditional market competition thinking holds under perfect green markets?. I think no, what do you think?; 2) Can global warming be addressed properly outside perfect green market thinking?. I think no, what do you think?; 3) Are perfect green markets consistent with ongoing government intervention?. I think no, what do you think?; 4) Can dwarf green market solutions work without ongoing government intervention?. I think no, what do you think?; and 5) Can current ongoing government intervention lead to extreme environmental blow back against the government in the future?. I think yes, what do you think?

Specific conclusions

First, it was stressed that when we recognize that the environment matters and decide to correct the traditional market, then the assumptions of perfect market competition shift towards the assumptions of perfect green market competition. Second, it was indicated that when we internalize the environmental cost of doing business, the price structure and the choice structure of the perfect market shifts towards that of the green market. Third, it was pointed out that a shift in the price structure to green markets means also a shift of the cost and revenue structures, short and long term too to those of green markets. Fourth, the green market assumptions, the green market model structure, the green market short term cost structure and the green market short term cost structure, all were linked to point out how markets should be expected to work under perfect green market competition.

General conclusions

To properly deal with traditional economic issues, we need the microeconomic and macroeconomic thinking behind the expected working of perfect market competition and perfect market thought. To properly deal with green market issues, we need green micro-economic and green macroeconomic thinking behind the expected working of perfect green

market competition and green market thought. As the latter type of thinking does not currently exist, it was shown in this paper how traditional perfect market thinking can be greened in terms of assumptions, model structure, and short and long term cost structures. In other words, it was described in detailed how to transform perfect market competition thinking into perfect green market competition thinking to be able to highlight how markets should be expected to work under perfect green market competition.

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