Sustainability thought 173: Using the sustainability market price to derive the three perfect market ways to correct distorted traditional market pricing mechanisms under externality cost internalization

By

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Abstract

The perfect sustainability market price accounts for all costs of production at a profit. If social and environmental costs of production are not accounted for we have the pricing mechanism of the perfect traditional market at a profit. If only the social costs associated with production are not accounted for, then we have the pricing mechanism of the perfect green markets at a profit. And, if only environmental costs are left out of the pricing mechanism, then we have the pricing mechanism of the perfect red markets at profit. Hence, all these perfect markets, the sustainability market, the traditional market, the green market and the red market, are different forms of capitalism based markets, where the perfect traditional market is the most irresponsible market in terms of social and environmental concerns while the sustainability market is the most responsible one. This means that the sustainability market, the green market, and the red market can be seen as three different perfect paradigm shift ways in which the distorted pricing mechanism of the traditional market can be corrected through perfect market thinking and externality cost internalization. Notice that once all these perfect markets are in place, they tend towards producing at the lowest cost possible as there is a profit incentive to do so. And this raises the questions, how can we use the sustainability market price to derive the three perfect market ways to correct distorted traditional market pricing mechanisms under externality cost internalization? What are the implications of this? One of the goals of this paper is to provide answers to those questions.

Key words

Perfect traditional markets, perfect red markets, perfect green markets, perfect sustainability markets, sustainability gaps, social sustainability gap, environmental sustainability gap, socio-environmental sustainability gap, externality margin, paradigm shift, cost externalization, cost internalization.

Introduction

a) The perfect sustainability market and price

When the social(A), economic(B) and environmental(C) components of a system are equally relevant we have a perfect sustainability market(S); and therefore, the sustainability market price(SMP) accounts for all costs of production at a profit(i). The structure of the production price of the sustainability market(S) at a profit in terms of cost margins has been pointed out recently(Muñoz 2016) as indicated below:

1) SP = SMP = ECM + i + SM + EM

Hence, the sustainability market price mechanism(SP = SMP) accounts for economic costs(ECM), social costs(SM) and environmental costs(EM) of production at a profit i.

Implication 1:

Expression 1 above shows the structure of the sustainability market based capitalism or yellow capitalism or socially and environmentally friendly capitalism.

b) The perfect green market and price

When the economic(B) and environmental(C) components of a system are equally relevant we have the perfect green market(GM); and hence, the green market price(GMP) accounts for all economic costs(ECM) and environmental costs(EM) of production at a profit(i). Therefore, if we externalized all social costs(SM = 0), the expression 1 above becomes the green market price(GMP):

2) GMP = ECM + i + EM

Therefore, the green market price mechanism(GMP) accounts for economic costs(ECM) and environmental costs(EM) of production at a profit i. We know that in 2012 the Rio +20 conference the whole world was going green markets(UNCSD 2012a; UNCSD 2012b) tackling only the environmental issues associated with traditional economic development as pointed out in 1987 by the Brundtland Commission(WCED 1987).

Implication 2:

Expression 2 above shows the structure of green market based capitalism or green capitalism or fully environmentally friendly capitalism.

c) The perfect red market and price

When the economic(B) and social(A) components of a system are equally relevant we have the perfect red market(RM); and therefore, the red market price(RMP) accounts for all economic costs(ECM) and social costs(SM) of production at a profit(i). Therefore, if we

externalized all environmental costs(EM = 0), the expression 1 above becomes the red market price(RMP):

3) RMP = ECM + i + SM

So the red market price mechanism(RMP) accounts for economic costs(ECM) and social costs(SM) of production at a profit i.

Implication 3:

Expression 3 above shows the structure of red market based capitalism or red capitalism or fully socially friendly capitalism.

d) The perfect traditional market and price

When only the economic(B) component matters in a system we have the perfect traditional market(TM); and therefore, the traditional market price(TMP) accounts only for all economic costs(ECM) of production at a profit(i). Therefore, if we externalized all social and environmental costs(SM = EM = 0), the expression 1 above becomes the traditional market price(TMP):

4) TMP = ECM + i = P

Therefore, the traditional market price mechanism(TMP = P) accounts only for economic costs(ECM) of production at a profit i. We know that in Adam Smith's world(Smith 1776) the traditional market price clears the traditional market.

Implication 4:

Expression 4 above shows the structure of traditional market based capitalism or raw capitalism or fully socially and environmentally unfriendly capitalism.

e) Perfect market structure and responsibility in terms of cost externalization

Perfect markets have different levels of responsibility attached to them based on the nature of their cost externalization behavior as summarized in Table 1 below:

Table 1

Perfect Market Name	Market Structure	Price Structure	Cost Responsibility

The traditional market	**TM = aBc**	**TMP = ECM + i**	**Fully irresponsible**
The green market	**GM = aBC**	**GMP = ECM + i + EM**	**Partially responsible**
The red market	**RM = ABc**	**RMP = ECM + i + SM**	**Partially responsible**
The sustainability market	**S = ABC**	**SMP = ECM + i + SM + EM**	**Fully responsible**

Table 1 above shows that each perfect markets has a different model structure and each model structure is directly associated with specific type of cost externalization; and therefore, each model structure is linked to a specific type of cost responsibility. Notice too that only the cost of production associated with the components that are in dominant form are accounted for at a profit in each perfect market. For example, the traditional market is an economy only market so it accounts for only economic costs of production at a profit while green markets have dominant economy and dominant environment so they account for both economic and environmental costs of production at a profit.

Implication 5:

The structure of perfect markets in column 1 in Table 1 above shows that i) green markets, red markets and sustainability markets are all partnership based markets and that the perfect market is a non-partnership based market; and ii) that the traditional perfect market is the most cost irresponsible market among all those perfect markets in terms of cost externalization.

f) The cost margins that separate the perfect traditional market from other perfect markets

As all perfect markets have different cost externalization behavior, then the traditional perfect market can be seen as being separated by a different cost margin from each of the other perfect markets as indicated in Table 2 below:

Table 2

The traditional market	**The cost margin separating it from other perfect markets**	**The other perfect markets**

TMP = ECM + i = P	**EM**	**GMP = ECM + i + EM**
TMP = ECM + i = P	**SM**	**RMP = ECM + i + SM**
TMP = ECM + i = P	**SM + EM**	**SMP = ECM + i + SM + EM**

We can appreciate in Table 2 above that an environmental margin(EM) separates the traditional market price TMP from the green market price GMP while a social margin(SM) and environmental margin(EM) separates it from the sustainability market price SMP.

Implication 6:

The information in Table 2 above suggest that between perfect traditional market prices TMP and the other perfect market prices, namely the perfect green market price, the perfect red market price, and the perfect sustainability market price there are specific cost margins that separates them.

e) The need to understand the perfect market ways to correct distorted traditional market prices

As indicated above and summarized in Table 2 above, the perfect sustainability market price accounts for all costs of production at a profit. If social and environmental costs of production are not accounted for we have the pricing mechanism of the perfect traditional market at a profit. If only the social costs associated with production are not accounted for, then we have the pricing mechanism of the perfect green markets at a profit. And, if only environmental costs are left out of the pricing mechanism, then we have the pricing mechanism of the perfect red markets at profit. Hence, all these perfect markets, the sustainability market, the traditional market, the green market and the red market, are different forms of capitalism based markets, where the perfect traditional market is the most irresponsible market in terms of social and environmental concerns while the sustainability market is the most responsible one. This means that the sustainability market, the green market, and the red market can be seen as three different perfect paradigm shift ways in which the distorted pricing mechanism of the traditional market can be corrected through perfect market thinking and externality cost internalization. Notice that once all these perfect markets are in place, they tend towards producing at the lowest cost possible as there is a profit incentive to do so. And this raises the questions, how can we use the sustainability market price to derive the three perfect market ways to correct distorted traditional

market pricing mechanisms under externality cost internalization? What are the implications of this? One of the goals of this paper is to provide answers to those questions.

Goals of this paper

a) To point out analytically and graphically the nature of sustainability gaps created when the traditional market pricing mechanism does not account for social and/or environmental costs of production; b) To highlight analytically and graphically the nature of perfect markets that come along when the traditional market pricing mechanism accounts for social and/or environmental costs of production; and c) To stress and compare the nature of working of perfect markets, be it the traditional perfect market or the perfect red market or the perfect green market or the perfect sustainability market.

Methodology

First, the terminology and operational concepts, merging rules, externalization and internalization, and sustainability gap rules are shared. Second, the sustainability gaps separating the perfect traditional market from the other perfect markets is pointed out both analytically and graphically. Third, how the closing of the sustainability gaps leads to the 3 perfect ways to correct the distorted traditional market price shifting the traditional market towards red markets, green markets, and sustainability markets is indicated both analytically and graphically. Fourth, how the traditional market, the red market, the green market, and the sustainability market once in place work is stressed and compared. And finally, some food for thoughts and relevant conclusions are listed.

Terminology

A = Dominant society system	a = Passive society system
B = Dominant economy system	b = Passive economic system
C = Dominant environmental system	c = Passive environmental system
S = Perfect sustainability market	SMP = Sustainability market price
RM = Perfect red market	RMP = Red market price
GM = Perfect green market	GMP = Green market price

TM = Perfect traditional market TMP = Traditional market price

E[ ] = Externalization venue I[ ] = Internalization venue

SG = Sustainability gap SSG = Social sustainability gap

ESG = Environmental sustainability gap SESG = Socio-environmental sustainability gap

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Operational concepts, model structures; and internalization, externalization and sustainability gap opening and closing rules.

A) Operational concepts

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

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

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

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

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

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

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

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

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

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

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

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

13) Flawed paradigm, one that creates abnormalities.

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

15) The perfect traditional market, the market cleared by the traditional market price(TMP = P), an economy only market at the heart of raw capitalism.

16) The perfect red market, the market cleared by the red market price(RMP = P + SM), a society and economy market at the heart of red capitalism.

17) The perfect green market, the market cleared by the green market price(GMP = P + EM), an environment and economy market at the heart of green capitalism.

18) The perfect sustainability market, the market cleared by the sustainability market price(SMP = P + SM + EM), a society and environment and economy market at the heart of yellow capitalism.

B) Paradigm structures

1) A golden paradigm

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

i) GOM = R

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

2) A flawed paradigm

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

ii) FLM = R(A1, A2,….An)

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

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

1) Impact on the golden paradigm

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

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

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

2) Impact on the flawed paradigm

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

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

The expression iv) above tells us that the TKTL loop process transforms flawed dominant paradigms FLM in the end into golden paradigms GOM by correcting the abnormalities A1…..An affecting them and shifting them in the process.

D) Relevant market structures

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

1) The traditional market as a golden model

i) TM = B

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

2) The traditional market under social abnormalities(a)

ii) TM = aB

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

3) The traditional market under environmental abnormalities(c)

iii) TM = Bc

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

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

iv) TM = aBc

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

5) The red market under environmental abnormalities(c)

v) RM = ABc

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

6) The green market under social abnormalities(a)

vi) GM = aBC

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

7) The sustainability market has no abnormalities

vii) SM = ABC

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

E) Abnormality externalization and internalization rules

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

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

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

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

F) Sustainability gap creation and closing rules

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

a) $E[Y] = SG_Y$ **b) $E[X] = SG_X$** **c) $E[Z] = SG_Z$**

d) $I[SG_Y] = Y$ **e) $I[SG_X] = X$** **f) $I[SG_Z] = Z$**

g) $I\{E[Y]\} = Y$ **h) $I\{E[X]\} = X$** **i) $I\{E[Z] = Z$**

j) $E[YX] = SG_{YX}$ **k) $I\{SG_{YX}\} = YX$** **l) $I\{E[YX]\} = YX$**

The sustainability gaps separating the traditional market from other markets

If we take the costs margins left out of the perfect traditional market price in Table 2 and column 2 above in the introduction and we take them as cost margins being externalized(E[cost margin]), then we create sustainability gaps(SG) so that E[Cost margin] = SG. For example, if the traditional market price TMP externalizes environmental costs EM, then it creates an environmental sustainability gap ESG since E[EM] = ESG, a situation shown in Table 3 below:

Table 3

The traditional market	**The sustainability gaps created when externalizing costs**	**The other markets after full cost corrections**
TMP = ECM + i = P	**E[EM] = ESG**	**GMP = ECM + i + EM**
TMP = ECM + i = P	**E[SM] = SSG**	**RMP = ECM + i + SM**
TMP = ECM + i = P	**E[SM + EM] = SESG**	**SMP = ECM + i + SM + EM**

Therefore, when cost margins are externalized and hence, they are left out of the pricing mechanism of the perfect traditional market(TM), we create sustainability gaps(SG) that separate the perfect traditional market from the other perfect markets.

Implication 7:

The information in Table 3 above tells us that there is a different cost margin externality problem(E[cost]) leading to sustainability gaps(SG) separating the traditional market price TMP = P from the other market prices, namely an environmental sustainability gap ESG separating perfect traditional markets to perfect green markets, a social sustainability gap SSG separating it from red markets, and a socio-environmental sustainability gap SESG separating it from a sustainability market.

The nature of the sustainability gaps separating the traditional market from the other perfect markets shown in Table 3 above can be appreciated graphically in Figure 1 below:

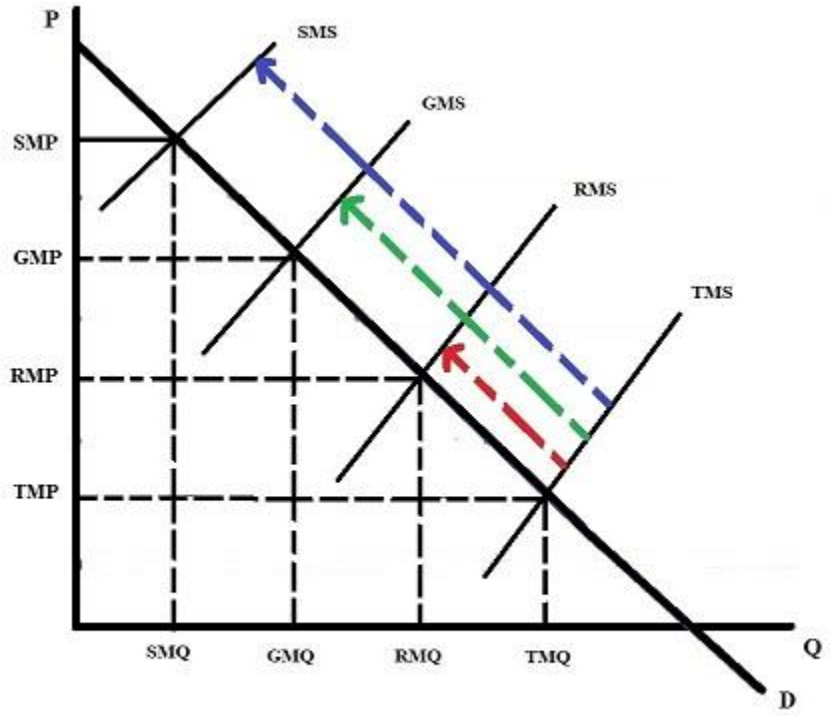

Figure 1 The sustainability gaps(SG) separating the perfect traditional market price(TMP) from the perfect red market price(RMP), the perfect green market price(GMP), and the perfect sustainability market price(SMP)

We can appreciate based on Figure 1 above that i) there is a social sustainability gap SSG separating the perfect traditional market and the perfect red market as indicated by the broken red arrow; ii) there is an environmental sustainability gap ESG separating the perfect traditional market and the perfect green market as indicated by the broken green arrow; and iii) there is a socio-environmental sustainability gap SESG separating the perfect traditional market from the perfect sustainability market as indicated by the broken blue arrow. Notice that the lowest the price the most it is produced and consumed so that TMQ > RMQ > GMQ > SMQ since TMP < RMP < GMP < SMP.

The closing of the sustainability gaps separating traditional market from other markets leads to the 3 perfect ways to correct distorted perfect traditional market prices

If we internalize the cost externalization process leading to sustainability gaps shown in Table 3 above in column 2 we induce a shift from the perfect traditional market to the other perfect markets as when doing that we are closing sustainability gaps in the process. For example, if we internalized the environmental cost externalization process we internalized the environmental sustainability gap problem leading to a paradigm shift from traditional markets to green markets as I(E[EM]) = I[ESG] induces a shift from traditional market price TMP to green market price GMP, a highlighted in Table 4 below.

Table 4

The traditional market	**Closing sustainability gaps when internalizing costs**	**The other markets after full cost corrections**
	I(E[EM]) = I[ESG]	
TMP = ECM + i = P	**----------→**	**GMP = ECM + i + EM**
	I(E[SM]) = I[SSG]	
TMP = ECM + i = P	**----------→**	**RMP = ECM + i + SM**
	I(E[SM + EM]) = I[SESG]	
TMP = ECM + i = P	**----------→**	**SMP = ECM + i + SM + EM**

Notice that cost internalization in Table 4 above shift the perfect traditional perfect market to another perfect market depending on which type of cost margin is internalized, and therefore, depending on which type of sustainability gap is closed. For example, when the environmental margin is internalized{I(E[EM] = I[ESG] = EM}, the traditional market price TMP = P = ECM + i shifts to the green market price GMP = P + EM = ECM + i + EM.

Implication 8:

The information in Table 4 above tells us that correcting distorted traditional market prices TMP = P to reflect social costs SM and/or environmental costs EM of production through externality cost internalization leads to paradigm shift.

The closing of sustainability gaps separating the traditional market from the other perfect markets through cost internalization shown in Table 4 above can be indicated graphically as in Figure 2 below:

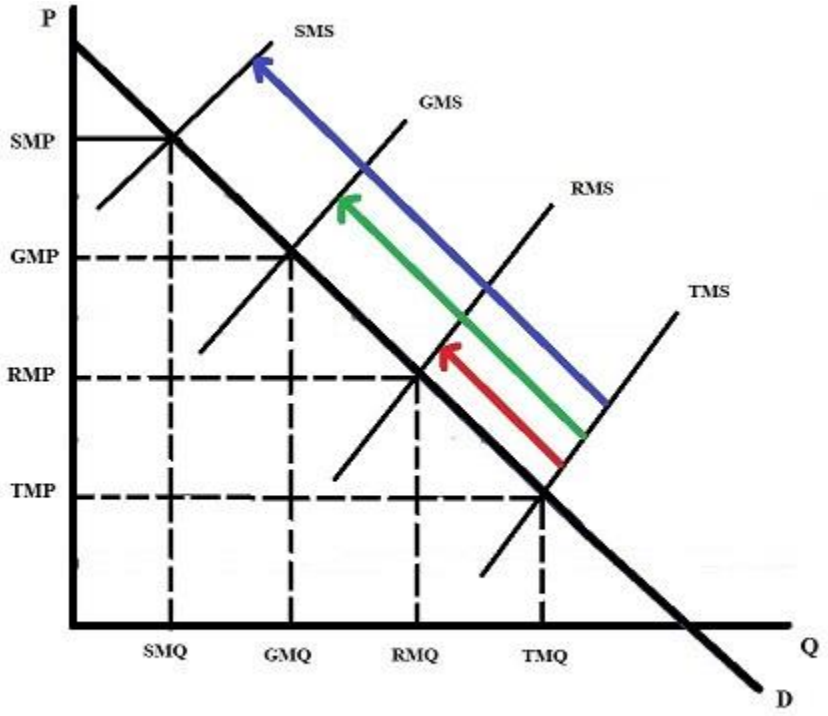

Figure 2 **The three perfect ways to correct the distorted perfect traditional market price(TMP) are to shift it to red market prices(RMP), to shift it to green market prices(GMP), and to shift it to sustainability market pricing(SMP).**

We can indicate based on Figure 2 above that i) when the social sustainability gap SSG is closed through social cost internalization, then the perfect traditional market shift to the perfect red market as indicated by the red arrow; ii) when the environmental sustainability gap ESG is closed through environmental cost internalization, then the perfect traditional market shift to the perfect green market as indicated by the green arrow; and iii) when the socio-environmental sustainability gap SESG is closed through socio-environmental cost internalization, then perfect traditional market shifts to the perfect sustainability market as indicated by the blue arrow. Again, notice that the lowest the price the most it is produced and consumed so that TMQ > RMQ > GMQ > SMQ since TMP < RMP < GMP < SMP.

The working of all perfect markets

When perfect markets are in place, then the drive to produce and consume at the lowest cost possible will provide the rational for constantly seeking to maximize profits as the lowest the price the more production and consumption is possible, and hence, more profits, as shown in Figure 3 below:

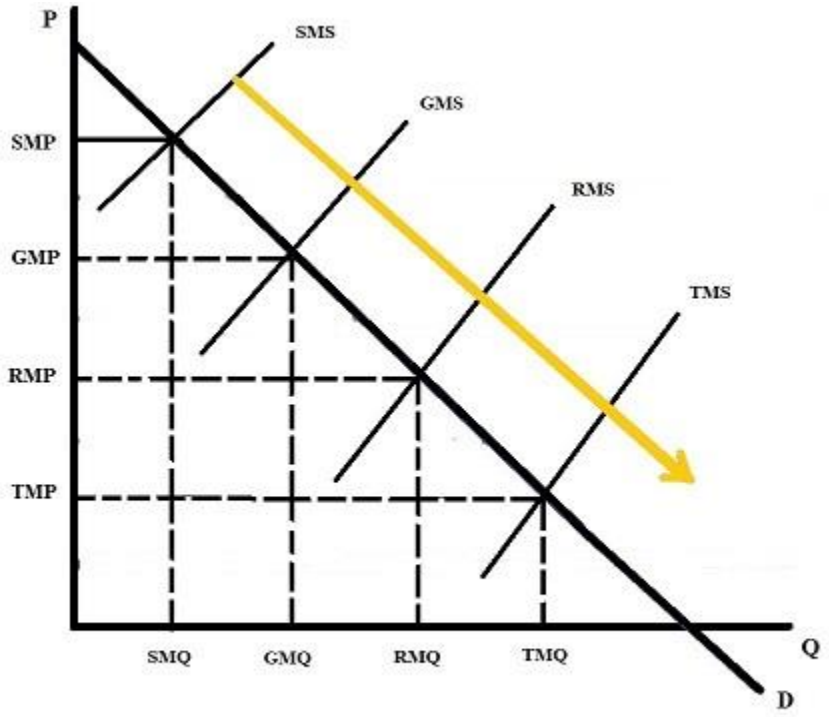

Figure 3 The working of all perfect markets once in place, perfect traditional market(TM), perfect red market(RM), perfect green market(GM), and perfect sustainability market(S)

We can highlight based on Figure 3 above that the drive to maximize profits moves from left to right as indicated by the yellow arrow once perfect markets are in place as then the drive to produce at the lowest cost possible will take hold in each perfect market.

i) The working of the perfect traditional market

Once in place, perfect traditional markets will drive to produce at the lowest economic cost possible to maximize profits as shown by their market price:

TMP = ECM + i

We can notice that the lower the economic margin ECM, the lower the price, a situation that drives the behavior to produce at the lowest traditional market price TMP possible to maximize profits.

ii) The working of the perfect red market

Once in place, perfect red markets will strive to produce at the lowest socio-economic cost possible to maximize profits as indicated by their market price:

RMP = ECM + i + SM

We can observe that the lower the economic margin ECM and/or the lower the social margin, the lower the price, a situation that drives the behavior to produce at the lowest red market price RMP possible to maximize profits.

iii) The working of the perfect green market

Once in place, perfect green markets will tend to produce at the lowest eco-economic cost possible to maximize profits as indicated by their market price:

GMP = ECM + i + EM

We can see that the lower the economic margin ECM and/or the lower the environmental margin EM, the lower the price, a situation that drives the behavior to produce at the lowest green market price GMP possible to maximize profits.

iv) The working of the perfect sustainability market

Once in place, perfect sustainability markets will move to produce at the lowest socio-eco-economic cost possible to maximize profits as indicated by their market price:

SMP = ECM + i + SM + EM

We can appreciate that the lower the economic margin ECM or the lower the social margin SM or the lower the environmental margin EM or the lower any combination of cost margins, the lower the price, a situation that drives the behavior to produce at the lowest sustainability market price SMP possible to maximize profits.

Food for thoughts

1) Could red markets be seen as poverty reduction markets? I think yes, what do you think?; 2) Are green markets environmental pollution reduction markets? I think yes, what do you think?; 3) Can all perfect markets be seen as profit seeking markets? I think yes, what do you think?; and 4) Can all perfect markets be seen as zero profit markets? I think yes, what do you think?

Conclusions

First, it was pointed out analytically and graphically that externalizing costs, be it social costs and/or environmental costs creates sustainability gaps affecting the working of traditional perfect markets making them different versions of distorted markets. Second, it was highlighted analytically and graphically that closing sustainability gaps through externality cost internalization corrects distorted traditional market prices shifting them towards green market prices or red market prices or sustainability market prices depending on which type of sustainability gap is closed, leading to the perfect green market or the perfect red market or the perfect sustainability market. And third, it was stressed that all perfect markets are expected to tend to produce, just as the perfect traditional market does, at the lowest cost possible to maximize profits.

In general, it was shown that there are 3 types of distorted traditional market prices, those distorted in social terms, those distorted in environmental terms, and those distorted in socio-environmental terms; and therefore, there are 3 perfect ways to correct distorted traditional market prices through externality cost internalization, namely the perfect red market way, the perfect green market way, and the perfect sustainability market way; all of which are driven by profit making behavior at the lowest cost possible.

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