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Sustainability thought 174: Using the sustainability market price to derive the three imperfect market ways to manage the consequences of distorted traditional market pricing mechanisms under externality cost management

By

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Abstract

The perfect sustainability market price accounts for all costs of production at a profit. If only some of the social costs and some of the environmental costs of production are accounted for, then we have the pricing mechanism of the dwarf sustainability market at a profit. If all social and environmental costs of production are not reflected in the market price, then we have the pricing mechanism of the perfect traditional market at a profit. If the social costs associated with production are not accounted for, but some environmental costs are, then we have the pricing mechanism of the dwarf green markets at a profit. And if environmental costs are left out, but some social costs are included in the pricing mechanism, then we have the pricing mechanism of the dwarf red markets at profit. Hence, all these dwarf markets, the dwarf sustainability market, the dwarf green market and the dwarf red market, are different forms of dwarf capitalism based markets that come along when managing the consequences of the price distortions of traditional markets, where the perfect traditional market is the most irresponsible market in terms of social and environmental concerns while the dwarf sustainability market is a more responsible market as some social and some environmental costs of production are accounted for then. This means that the dwarf sustainability market, the dwarf green market, and the dwarf red market can be seen as three different imperfect paradigm shift ways in which the consequences of the distorted pricing mechanism of the traditional market can be managed through dwarf market thinking and externality cost management. Notice that once all these dwarf markets are in place, they will produce at the price that covers the externality management cost, they will not tend towards producing at the lowest cost possible as perfect markets do as

they do not have the profit incentive to do so. And this brings the questions, how can we use the sustainability market price to derive the three imperfect market ways to manage the consequences of distorted traditional market pricing mechanisms under externality cost management? What are the implications of this?

Key words

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

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 dwarf sustainability market and price

When the social(A) and environmental(C) components are not equally relevant to the economic component(B), then we have the dwarf sustainability market(DSM); and therefore, the dwarf sustainability market price(DSP = DSMP) accounts for all economic cost of production at a profit, but not all social and not all environmental costs of production as stated below:

2) DSP = DSMP = ECM + i + DSM + DEM

Expression 2 above shows the structure of the dwarf sustainability market based capitalism or dwarf yellow capitalism or dwarf socially and environmentally friendly capitalism.

Notice here that SM > DSM and EM > DEM as not all social(A) and environmental(C) costs associated with production are accounting for in the dwarf sustainability market price, and hence; the SP = SMP > DSP = DSMP.

c) The dwarf green market and price

When the economic(B) component is fully relevant and the environmental(C) component of a system is partially relevant we have the dwarf green market(DGM); and hence, the dwarf green market price(DGMP) accounts for all economic costs(ECM) of production and some environmental costs(DEM) of production at a profit(i). Therefore, if we externalized all social costs(DSM = 0), the expression 2 above becomes the dwarf green market price(DGMP):

3) DGMP = ECM + i + DEM

Hence, the dwarf green market price mechanism(DGMP) accounts for all economic costs(ECM) and some environmental costs(DEM) 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), but in the end they went the way of dwarf green markets a la environmental pollution management(Muñoz 2017).

Implication 3:

Expression 3 above shows the structure of dwarf green market based capitalism or dwarf green capitalism or dwarf environmentally friendly capitalism.

d) The dwarf red market and price

When the economic(B) component is fully relevant and the social(A) component of a system is partially relevant we have the dwarf red market(DRM); and therefore, the dwarf red market price(DRMP) accounts for all economic costs(ECM) of production and some social costs(DSM) of production at a profit(i). Therefore, if we externalized all environmental costs(DEM = 0), the expression 2 above becomes the dwarf red market price(DRMP):

4) DRMP = ECM + i + DSM

So the dwarf red market price mechanism(DRMP) accounts for all economic costs(ECM) of production and some social costs(DSM) of production at a profit i.

Implication 4:

Expression 4 above shows the structure of dwarf red market based capitalism or dwarf red capitalism or dwarf socially friendly capitalism.

e) 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(DSM = DEM = 0), the expression 2 above becomes the traditional market price(TMP):

5) 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 5:

Expression 5 above shows the structure of traditional market based capitalism or raw capitalism or fully socially and environmentally unfriendly capitalism.

f) Linking the patching of the sustainability market price with the dwarf sustainability market price

If we patch(F) the sustainability market price SP = SMP at a profit "i" in expression 1 above to reflect only some social costs(DSM) and only some environmental costs(DEM) associated with economy only development(B) at a profit(ECM + i), then we transform it into the dwarf sustainability market price DSM = DSMP as indicated in expression 6 below:

6) F(SP) = F(SMP) = ECM + i + F(SM) + F(EM) = DSP = DSMP

Expression 6 above tells us that if we patch the sustainability market price{F(SP) = F(SMP)} we arrive to the dwarf sustainability market price DSP = DSMP. And therefore, if we compared expression 2 above with expression 6 we see the following: i) the patching(F) of the sustainability market price leads to the dwarf sustainability market price so that F(SP) = F(SMP) = DSP = DSMP; ii) the patching(F) of the social margin SM leads to the dwarf social margin DSM so that F(SM) = DSM; iii) the patching(F) of the environmental margin EM leads to the dwarf environmental margin DEM so that F(EM) = DEM; and hence, iv) we can see the dwarf sustain inability market price DSMP as a distorted sustainability market price SMP to reflect some social and some environmental concerns at the same time at a profit or we can see the sustainability market price SMP as a correction of the dwarf sustainability market price to reflect fully social and environmental concerns.

Implication 6:

We can use expression 6 above arrived using market patching theory(F) to point out the three different imperfect market ways or dwarf market ways in which the traditional market price's distortions can be patched using externality cost management thinking.

g) Dwarf market structure and responsibility in terms of management costs

Perfect markets and dwarf markets have different levels of responsibility attached to them based on the nature of their cost externalization behavior, full or partial, 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 dwarf green Market	**DGM = aBC_M**	**DGMP = ECM + i + DEM**	**Partial dwarf responsibility**
The dwarf red Market	**DRM = A_MBc**	**DRMP = ECM + i + DSM**	**Partial dwarf responsibility**
The dwarf sustainability Market	**DS = A_MBC_M**	**DSMP = ECM + i + DSM + DEM**	**Full dwarf responsibility**

Table 1 above shows that all markets, perfect markets and dwarf markets, have a different model structure and each model structure is directly associated with specific type of cost externalization, partially or fully; and therefore, each model structure is linked to a specific type of cost responsibility, full, partial dwarf, and full dwarf. Notice too that only the cost of

production associated with the component that is in dominant form and those that are given some relevant form are accounted for at a profit in each dwarf market. But only the economic costs of production at a profit are accounted for in perfect traditional markets TM. For example, the traditional market is an economy only market(TM = aBc) so it accounts for only economic costs of production at a profit while dwarf green markets(DGM = aBC_M) have dominant economy and an environment under management so dwarf green markets account for both all the economic costs(ECM) and some environmental costs of production(DEM) at a profit.

Implication 7:

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

g) The patched cost margins or dwarf cost margins that separate the perfect traditional market from dwarf markets

As all dwarf markets have different management cost behavior consistent with a specific patching process(F), then the traditional perfect market TM can be seen as being separated by a different dwarf cost margin from each of the dwarf markets coming from patching cost externality problems embedded in the traditional market price TMP as indicated in Table 2 below:

Table 2

The traditional market	The dwarf cost margin separating these markets	The dwarf markets
TMP = ECM + i = P	**F(EM]) = DEM**	**DGMP = ECM + i + DEM**
TMP = ECM + i = P	**F(SM]) = DSM**	**DRMP = ECM + i + DSM**
TMP = ECM + i = P	**F(SM + EM) = DSEM**	**DSMP = ECM + i + DSM + DEM**

We can appreciate in Table 2 above that a dwarf environmental margin(DEM) separates the traditional market price TMP from the dwarf green market price DGMP while a dwarf social margin(DSM) and dwarf environmental margin(DEM) or the dwarf socio-environmental margin(DSEM) separates it from the dwarf sustainability market price DSMP. Notice the following: i) that the patching of the environmental margin leads to the dwarf environmental margin F(EM) = DEM, ii) the patching of the social margin leads to the dwarf social margin F(SM) = DSM; and iii) the patching of the social and environmental margins leads to the dwarf socio-environmental margin F(SM + EM) = DSEM = DSM + DEM; and hence, iii) all dwarf margins come from patching margins, so they are determined externally to the dwarf market.

Implication 8:

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

h) The need to understand the imperfect market ways to address distorted traditional market prices

As indicated above the perfect sustainability market price accounts for all costs of production at a profit. If only some of the social costs and some of the environmental costs of production are accounted for, then we have the pricing mechanism of the dwarf sustainability market at a profit. If all social and environmental costs of production are not reflected in the market price, then we have the pricing mechanism of the perfect traditional market at a profit. If the social costs associated with production are not accounted for, but some environmental costs are, then we have the pricing mechanism of the dwarf green markets at a profit. And if environmental costs are left out, but some social costs are included in the pricing mechanism, then we have the pricing mechanism of the dwarf red markets at profit. Hence, all these dwarf markets, the dwarf sustainability market, the dwarf green market and the dwarf red market, are different forms of dwarf capitalism based markets that come along when managing the consequences of the price distortions of traditional markets, where the perfect traditional market is the most irresponsible market in terms of social and environmental concerns while the dwarf sustainability market is a more responsible market as some social and environmental costs are accounted for then. This means that the dwarf sustainability market, the dwarf green market, and the dwarf red market can be seen as three different imperfect paradigm shift ways in which the consequences of the distorted pricing mechanism of the traditional market can be managed through dwarf market thinking and externality cost management. Notice that once all these dwarf markets are in place, they will produce at the price that covers the externality management cost, they will not tend towards producing at the lowest cost possible as perfect markets do as they do not have the profit incentive to do so. And this brings the questions, how can we use the sustainability market price to derive the three imperfect market ways to manage the

consequences of distorted traditional market pricing mechanisms under externality cost management? What are the implications of this?

Goals of this paper

a) To point out analytically and graphically the nature of dwarf sustainability gaps created when the traditional market pricing mechanism account for only some social and/or only some environmental costs of production; b) To highlight analytically and graphically the nature of dwarf markets that come along when the traditional market pricing mechanism accounts for only some social and/or only some environmental costs of production; c) To stress the nature of the working associated with each dwarf market and compare it with the nature of the working of perfect traditional market.

Methodology

First, the terminology and operational concepts, merging rules, externalization and internalization, and sustainability gap rules and closing rules are shared. Second, the dwarf sustainability gaps separating the perfect traditional market from dwarf markets are pointed out both analytically and graphically. Third, how the closing of dwarf sustainability gaps leads to the 3 imperfect ways to address the distorted traditional market price shifting it towards dwarf red markets, dwarf green markets, and dwarf sustainability markets is indicated both analytically and graphically. Fourth, how the dwarf red market, the dwarf green market, and the draft sustainability market actually work once in place is stressed. Sixth, how the working of the traditional perfect market compares to the working of dwarf markets is indicated. 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

DRM = Dwarf red market DGM = Dwarf green market

DS = Dwarf sustainability market DSSG = Dwarf social sustainability gap

DESG = Dwarf environmental sustainability gap E(Y) = Externality Y

DSESG = Dwarf socio-environmental sustainability gap F(E[Y]) = Patched externality Y

SM = Social margin DSM = Dwarf social margin

GM = Green margin DGM = Dwarf green margin

SEM = Socio-environmental margin DSEM = Dwarf socio-environmental margin

DGMP = Dwarf green market price DSEMP = Dwarf socio-environmental market price

DRMP = Dwarf red market price DSMP = Dwarf sustainability market price

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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.

19) The dwarf red market, the market cleared by the dwarf red market price(DRMP = P + DSM), a patched red market at the heart of dwarf socially friendly capitalism.

20) The dwarf green market, the market cleared by the dwarf green market price(DGMP = P + DEM), a patched green market at the heart of dwarf green market based capitalism.

21) The dwarf sustainability market, the market cleared by the dwarf sustainability market price(DSP = P + DSM + DEM), a patched sustainability market at the heart of dwarf yellow capitalism.

22) The dwarf social margin, the cost that reflects the assigned social cost of production(DSM) in the social externality management based market.

23) The dwarf environmental margin, the cost that reflects the assigned social cost of production(DEM) in the environmental externality management based market.

24) The dwarf sustainability margin, the cost that reflects the assigned social(DSM) and environmental(DEM) cost of production in the socio-environmental externality management based market.

B) Paradigm structures

1) A golden paradigm

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

i) GOM = R

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

2) A flawed paradigm

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

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**

G) Remaining sustainability gaps

If we have two dominant components Y and X and we have a cost margin $CM_Y = E[Y] = SG_Y$ and $CM_X = E[X] = SG_X$ plus we have a dwarf cost margin $DCM_Y = T_Y$ and $DCM_X = T_X$, where $CM_Y > DCM_Y$, $CM_X > DCM_X$ and hence, $E[Y] > T_Y$ and $E[X] > T_X$, then the remaining sustainability gap RSG for each variable comes as follows:

a) $RSG_Y = CM_Y - DCM_Y = E[Y] - T_Y = SG_Y - T_Y$

b) $RSG_X = CM_X - DCM_X = E[X] - TY = SG_X - T_X$

H) Patching of sustainability gaps

If we have two dominant components Y and X and we have a cost margin $CM_Y = E[Y] = SG_Y$, $CM_X = E[X] = SG_X$, and $CM_{YX} = E[YX] = SG_{YX}$; and we have dwarf market patches T_Y, T_X, and T_{YX}, then the patching(F) of sustainability gaps SG leading to dwarf sustainability gaps DSG works as follows:

a) $F(CM_Y) = F(E[Y]) = F(SG_Y) = DSG_Y = T_Y$

b) $F(CM_X) = F(E[X]) = F(SG_X) = DSG_X = T_X$

c) $F(CM_{YX}) = F(E[YX]) = F(SG_{YX}) = DSG_{YX} = T_{YX}$

d) $F(E[YX]) = F(E[Y] + E[X]) = DSG_{YX} = T_{YX}$

E) Internalizing patched sustainability gap to close them

If we have a two dominant components Y and X and we have patched cost margins such that $F(CM_Y) = F(E[Y]) = F(SG_Y) = DSG_Y = T_Y$ or $F(CM_{YX}) = F(E[YX]) = F(SG_{YX}) = DSG_{YX} = T_{YX}$, then the dwarf cost internalization process to shift markets to dwarf markets works as follows:

a) $I[F(CM_Y)] = I[F(E[Y])] = I[F(SG_Y)] = I[DSG_Y] = I[T_Y] = T_Y$

b) $I[F(CM_{YX})] = I[F(E[YX])] = I[F(SG_{YX})] = I[DSG_{YX}] = I[T_{YX}] = T_{YX}$

The dwarf sustainability gaps separating the traditional market from dwarf markets

When cost margins CM are patched(F) to create dwarf cost margins DCM, we create dwarf sustainability gaps DSG so that F(CM) = DCM = DSG, a situation shown in Table 3 below in the case of the dwarf environmental margin DEM, the dwarf social margin DSM, and the dwarf socio-environmental margin DSEM separating the perfect traditional market from dwarf markets:

Table 3

The traditional market	**The dwarf sustainability gaps Separating these markets**	**The dwarf markets**
TMP = ECM + i = P	**F(EM]) = DEM = DESG**	**DGMP = ECM + i + DEM**
TMP = ECM + i = P	**F(SM]) = DSM = DSSG**	**DRMP = ECM + i + DSM**
TMP = ECM + i = P	**F(SM + EM) = F(SESG) = DSEM = DSESG**	**DSMP = ECM + i + SM + EM**

Therefore, when specific cost margins are patched to create corresponding dwarf cost margins we create dwarf sustainability gaps(DSG) such as the dwarf environmental sustainability gap DESG, the dwarf social sustainability gap DSSG, and the dwarf socio-environmental sustainability gap DSESG that separate the perfect traditional market from dwarf green markets, from dwarf red markets, and from dwarf sustainability markets respectively.

Implication 9:

The information in Table 3 above tells us that there is a different cost margin patching procedures leading to dwarf sustainability gaps(DSG) that are separating the traditional market price TMP = P from dwarf market prices, namely a dwarf environmental sustainability gap DESG separating perfect traditional markets from dwarf green markets, a dwarf social sustainability gap DSSG separating it from dwarf red markets, and a dwarf socio-environmental sustainability gap DSESG separating it from the dwarf sustainability market.

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

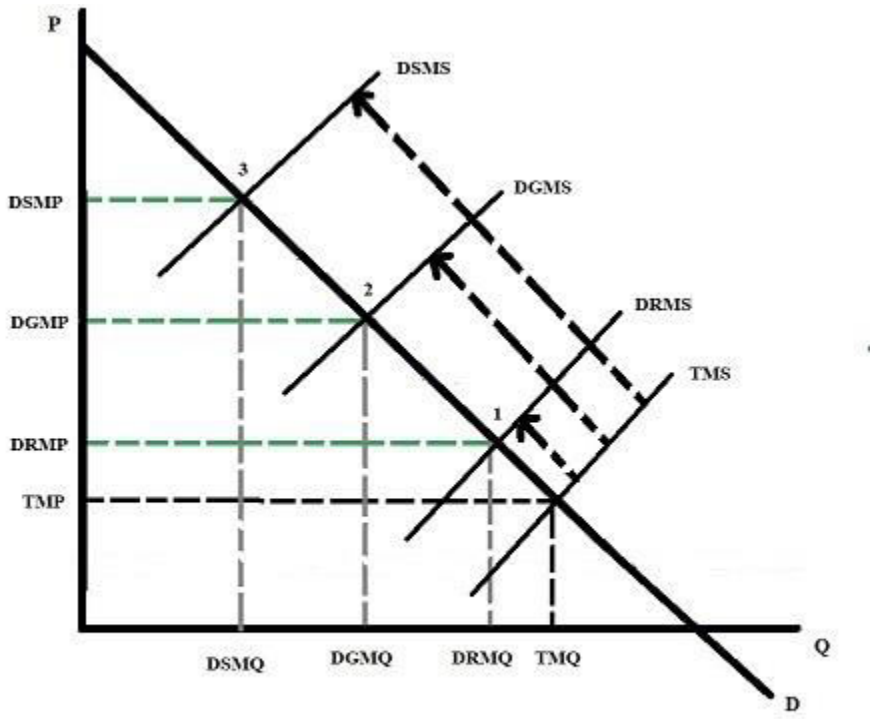


Figure 1 The dwarf sustainability gaps separating the traditional market TM from dwarf markets such as the dwarf social sustainability gap DSSG at point 1, the dwarf environmental sustainability gap DESG at point 2, and the dwarf socio-environmental sustainability gap DSESG at point 3.

We can appreciate based on Figure 1 above that i) there is a dwarf social sustainability gap DSSG separating the perfect traditional market and the dwarf red market as indicated by the broken arrow from TMS to DRMS; ii) there is a dwarf environmental sustainability gap DESG separating the perfect traditional market and the dwarf green market as indicated by the broken arrow from TMS to DGMS; and iii) there is a dwarf socio-environmental sustainability gap DSESG separating the perfect traditional market from the dwarf sustainability market as indicated by the broken arrow from TMS to DSMS. Hence, there is a dwarf social sustainability gap DSSG at point 1, there is a dwarf environmental sustainability gap DESG at point 2, and there is a dwarf socio-environmental sustainability gap DSESG at point 3 in |Figure 1 above. Notice in Figure 1 above that the lowest the price the most it is produced and consumed so that TMQ > DRMQ > DGMQ > DSMQ since TMP < DRMP < DGMP < DSMP.

The closing of dwarf sustainability gaps separating traditional market from dwarf markets leads to the 3 imperfect ways to address distorted perfect traditional market prices through externality cost management

If we internalize the process of patching of cost margin leading to dwarf sustainability gaps shown in Table 3 above in column 2 we induce a shift from the perfect traditional market to the dwarf markets, which are imperfect markets, as when doing that we are closing dwarf sustainability gaps in the process. For example, if we internalized the dwarf environmental cost patching process we internalized the dwarf environmental sustainability gap problem leading to an imperfect paradigm shift from traditional markets to dwarf green markets as I[F(EM]) = I[DEM]) = I[DESG] induces a shift from traditional market price TMP to dwarf green market price DGMP, as highlighted in Table 4 below.

Table 4

The traditional market	**Closing dwarf sustainability gaps when adding management costs**	**The dwarf markets after adding dwarf costs**
	I[F(EM) = I(DEM) = I[DESG]	
TMP = ECM + i = P	**----------→**	**DGMP = ECM + i + DEM**
	I[F(SM)] = I(DSM]) = I[DSSG]	
TMP = ECM + i = P	**----------→**	**DRMP = ECM + i + DSM**
	I[F(SM + EM)] = I(DSM + DEM) = I[DSESG]	
TMP = ECM + i = P	**----------→**	**DSMP = ECM + i + DSM + DEM**

Notice that the internalization of the externality cost patching process summarized in Table 4 above shifts the perfect traditional perfect market to a dwarf market depending on which type of patched cost margin is internalized, and therefore, depending on which type of dwarf sustainability gap is closed. For example, when the dwarf environmental margin is internalized(I[F[EM]) = I[DEM] = I[DESG]), the traditional market price TMP = P = ECM + i shifts to the dwarf green market price DGMP = P + DEM = ECM + i + DEM.

Implication 10:

The information in Table 4 above tells us that patching the distorted traditional market prices TMP = P to reflect some social costs DSM and/or some environmental costs DEM of production through externality cost management or dwarf cost internalization leads to imperfect paradigm shifts.

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

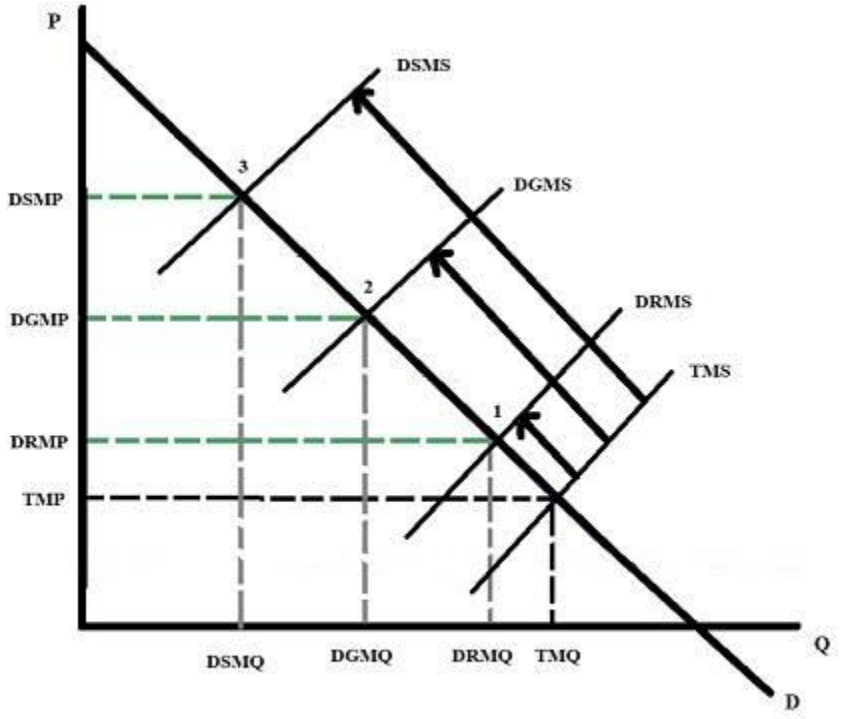


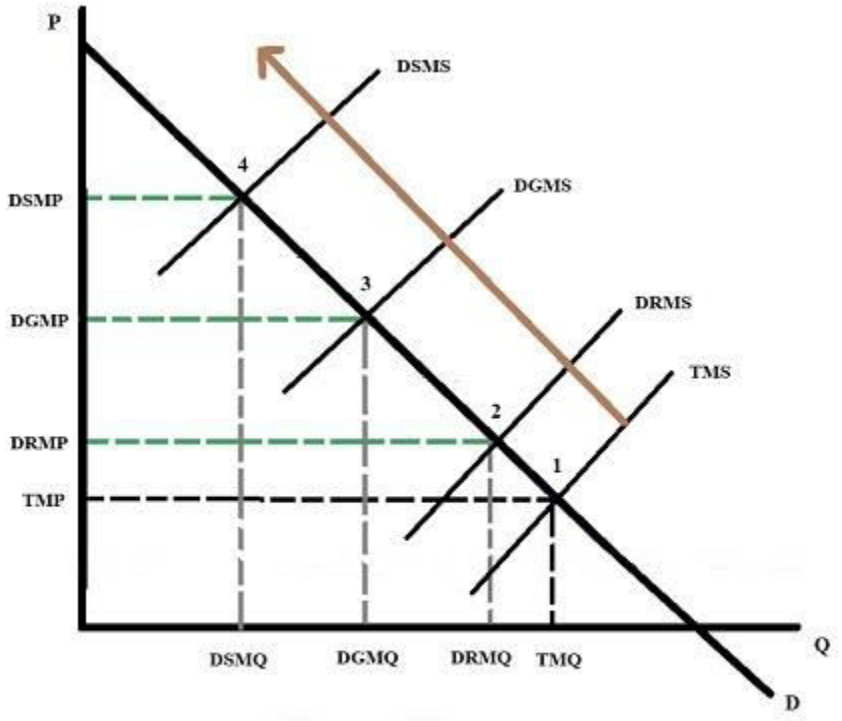
Figure 2 The dwarf markets that come along when closing the dwarf sustainability gaps separating traditional markets TM from dwarf markets such as the dwarf red market at point 1, the dwarf green market DGM at point 2, and the dwarf sustainability market DS at point 3.

We can indicate based on Figure 2 above that i) when the dwarf social sustainability gap DSSG is closed through dwarf social cost internalization, then the perfect traditional market shift to the dwarf red market as indicated by the continuous arrow from TMS to DRMS; ii) when the dwarf environmental sustainability gap DESG is closed through dwarf environmental cost internalization, then the perfect traditional market shift to the dwarf green market as indicated by the continuous arrow from TMS to DGMS; and iii) when the dwarf socio-environmental sustainability gap DSESG is closed through dwarf socio-environmental cost internalization, then perfect traditional market shifts to the dwarf sustainability market as indicated by the continuous arrow from TMS to DSMS. Hence, there is a dwarf red market DRM at point 1, there is a dwarf green market DGM at point 2, and there is a dwarf sustainability market DS at point 3 in Figure 2 above, which are three imperfect market ways to manage the consequences of distorted traditional market pricing mechanisms under externality cost management. Again, notice in

Figure 2 above that the lowest the price the most it is produced and consumed so that TMQ > DRMQ > DGMQ > DSMQ since TMP < DRMP < DGMP < DSMP.

The working of dwarf markets

When dwarf markets are in place, they do not drive to produce and consume at the lowest dwarf cost possible, they will produce at a profit at the given dwarf cost as they do not have an incentive to produce at a lower or higher price than the price made up by the given dwarf cost, which they happily will pass on consumers. And hence, the behavior of dwarf markets once in place can be seen as one that aims at creating production and consumption contracting markets to reduce social and/or environmental pollution by slowly or constantly increasing the dwarf cost or pollution management costs of dwarf markets as shown in Figure 3 below:



Figue 3 The working of dwarf markets once in place: i) they produce at the dwarf price determined by the assigned dwarf cost margin such as a point 2, point 3 and point 4; and ii) they only reduce pollution when the assigned dwarf cost margin is increased externally,

We can highlight based on Figure 3 above that there is no incentive to maximize profits by producing at the lowest dwarf cost margin possible as dwarf markets will continue to produce and consume at the given dwarf cost margin, and production and consumption, and therefore, social and/or environmental pollution can only be reduced if we increase the dwarf cost margin as indicated by the continuous brown arrow going from right to left from point 2 once dwarf markets are in place.

i) The working of the dwarf red market

Once in place, dwarf red markets will strive to produce at the dwarf red market price DRMP that reflects the dwarf social margin DSM as indicated by their market price:

DRMP = ECM + i + DSM

We can observe that the dwarf red market price DRMP reflects the given dwarf social margin DSM so it will produce and consume at point 2 in Figure 3 above. They will make money by simply passing the dwarf social margin to consumers, and they have no incentive to produce below that given dwarf social margin such as for example producing at point 1 or at point 3. They will reduce production, and therefore, social pollution, only when the given dwarf social margin is increased as indicated by the continuous brown arrow going from right to left from point 2 in Figure 3 above. Social pollution reduction is disconnected with the idea of socially clean markets.

ii) The working of the perfect green market

Once in place, dwarf green markets will strive to produce at the dwarf green market price DGMP that reflects the dwarf green margin DGM as indicated by their market price:

DGMP = ECM + i + DEM

We can see that the dwarf green market price DGMP reflects the given dwarf environmental margin DEM so it will produce and consume at point 3 in Figure 3 above. They will make money by simply passing the dwarf environmental margin to consumers, and they have no incentive to produce below that given dwarf green margin such as for example producing at point 2 or at point 4. They will reduce production, and therefore, environmental pollution, only when the given dwarf environmental margin is increased as indicated by the continuous brown arrow going from right to left from point 3 in Figure 3 above. Environmental pollution reduction is disconnected with the idea of environmentally clean markets.

iii) The working of the perfect sustainability market

Once in place, dwarf sustainability markets will strive to produce at the dwarf sustainability market price DSMP that reflects the dwarf social margin DSM and the dwarf environmental margin DEM as indicated by their market price:

DSMP = ECM + i + DSM + DEM

We can observe that the dwarf sustainability market price DSMP reflects the given dwarf social margin DSM and dwarf environmental margin DEM so it will produce and consume at point 4 in Figure 3 above. They will make money by simply passing the dwarf social margin and dwarf environmental margin to consumers, and they have no incentive to produce below that given dwarf social margin and dwarf environmental such as for example producing at point 3 or

beyond point 4. They will reduce production, and therefore, social and/or environmental pollution, only when the given dwarf social margin and/or the dwarf environmental margin are increased as indicated by the continuous brown arrow going from right to left from point 4 in Figure 3 above. Socio-environmental pollution reduction is disconnected with the idea of socio-environmentally clean markets.

Implication 11

Dwarf markets produce and consume at the given dwarf margin and they only move to reduce production and consumption, and therefore, reduce pollution, only when the dwarf margin is increased, making them pollution contraction markets.

Comparing the working of dwarf markets with that of the perfect traditional market

Once in place, perfect traditional markets TM will drive to produce at the lowest economic cost possible ECM to maximize profits "i" 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 as indicated by the continuous yellow arrow going from left to right from point 1 in Figure 4 below indicates:

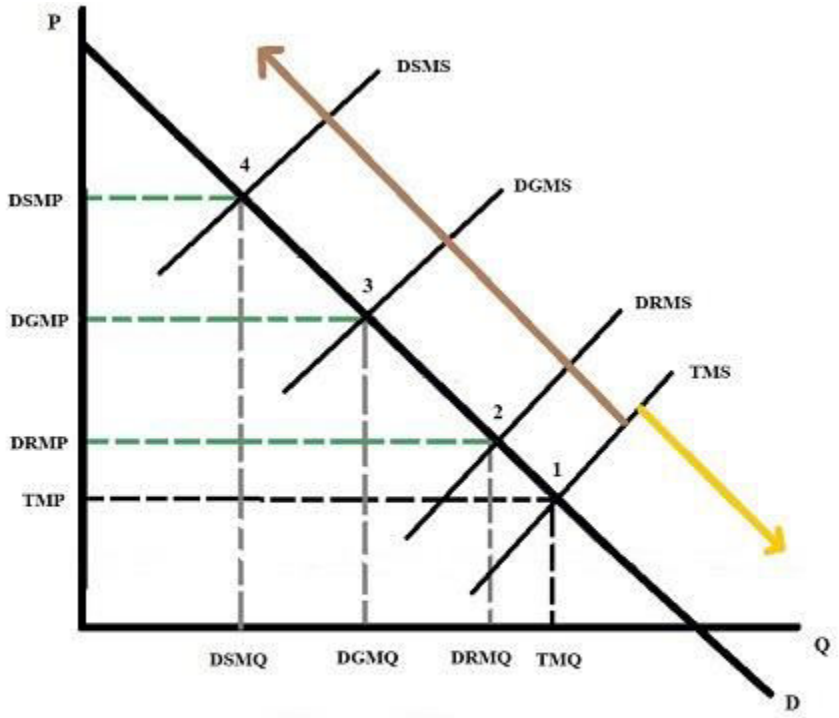


Figure 4 Comparing the working of dwarf markets with the working of the perfect traditional market: i) reducing pollution through externality cost managment or dwarf margins is based on contracting production and consumption as shown by the brown arrow going from right to left; and ii) Traditional economic expansion moves from left to right as it tend to produce at the lowest traditional market price possible expanding pollution.

Notice in Figure 4 above that the expected behavior of perfect traditional markets TM operating at point 1 to maximize profits "i" is to produce at the lowest traditional market price possible TMP moving to the right as indicated by the yellow arrow. Hence, the production behavior of perfect traditional markets TM goes in opposite direction than the production behavior of dwarf markets and they have opposite impact on pollution problem. More traditional market production means more pollution and less production led by pollution reduction management through dwarf markets means less pollution than in traditional markets. In other words, the production behavior and therefore, pollution generating behavior of the perfect traditional market as compared to that of dwarf markets works in the opposite way, expansion of production in traditional markets means more pollution and contraction of production in dwarf markets means less pollution, the interplay of production expansion and contraction explains the behavior of traditional markets expanding to the right as indicated by the yellow arrow while dwarf markets contract to the left as indicated by the brown arrow.

Implication 12

As the facts suggest if left as it is the traditional market will drive to produce at the lowest price possible to maximize profits creating in the process social and environmental pollution crises as it works under social and environmental externality neutrality assumptions while dwarf

market based production contractions lead to dwarf social and/or dwarf environmental pollution reduction.

Food for thoughts

1) Could dwarf red markets be seen as poverty reduction markets? I think No, what do you think?; 2) Are dwarf green markets environmental pollution reduction markets? I think No, what do you think?; 3) Can all dwarf markets be seen as pollution management markets? I think yes, what do you think?; and 4) Can all dwarf markets be seen as zero profit markets? I think yes, what do you think?

Conclusions

First, it was pointed out analytically and graphically that patching externality margins leads to dwarf cost margins and dwarf sustainability gaps that separate the traditional market from dwarf markets. Second, it was highlighted analytically and graphically that closing dwarf sustainability gaps through the internalization of patched cost margins or dwarf margins leads to different dwarf markets, namely the dwarf red market, the dwarf green market and the dwarf sustainability market. Third, it was stressed that there is no incentive for dwarf markets to produce at lower that the assigned pollution management margin or dwarf margin, and that they will reduce production, and therefore, reduce pollution, only if the dwarf margins are increased leading to higher dwarf market prices. Fourth, it was indicated that the traditional market once in place leads to producing at the lowest market price possible to maximize profits increasing the production of social and environmental pollution at the same time. And fifth, it was said that the working of dwarf markets and of perfect traditional markets in terms of production and profit seeking go in opposite direction as dwarf markets are production, and hence, pollution contraction markets while the traditional markets are production expansion, and therefore, pollution expansion markets.

In general we can say the following: i) it was shown that there are 3 types of dwarf markets, the dwarf red market, the dwarf green market, and the dwarf sustainability market, which are three imperfect market ways to manage the consequences of distorted traditional market pricing mechanisms under externality cost management; ii) It was mentioned that traditional markets are profit seeking free perfect markets that aim at producing at the lowest traditional market price possible, which makes them pollution generation based markets; and iii) it was indicated that we cannot expect traditional markets to pollute less if left alone; and we cannot expect dwarf markets to produce at levels different than the one determined by the assigned pollution cost or assigned dwarf margin as there is not a profit incentive for them to reduce pollution by producing below that dwarf market price.

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