

## The road towards sustainability markets: Linking cost externalization to market structure and price structure using qualitative comparative means

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**Abstract:** It can be said that any non-full sustainability market requires some form of cost externalization to exist and persist as maximization is the rule. The type of cost externalization on which a market model depends on determines the market structure and the price structure of that market as well as its level of responsibility. As cost externalization tends to full cost externalization, the market structure and the price structure tend towards the market structure and price structure of full unsustainability: this is a world of fully irresponsible markets. On the other hand, as the cost externalization tends to zero the market structure and price structure of markets tend towards the market structure and the price structure of sustainability markets: this is a world of fully responsible markets. Therefore, there is a need to understand how cost externalization is linked to market structure and price structure so as to be able to figure out for example how cost externalization is linked to distorted market prices or linked to the nature of paradigm mergers or linked to the nature of sustainability markets. Among the goals of this paper are: a) to link cost externalization to all possible market structures and price structures using qualitative comparative means; and b) to show that only when there is no cost externalization there are sustainability markets and sustainability prices.

**Key concepts:** Sustainability, sustainability markets, market structure, price structure, cost externalization, distorted prices, responsible markets, irresponsible markets, unsustainability, sustainability gaps, market models, maximization.

### Introduction

#### a) Cost externalization and unsustainability

It can be said that any non-full sustainability market requires some form of cost externalization to exist and persist as maximization is the rule. The type of cost externalization on which a market model depends on determines the market structure and the price structure of that market as well as its level of responsibility. How different market structures and price structures are linked to specific externality assumptions has been recently highlighted (Muñoz 2016a) as well as the fact that less cost externalization in markets means higher level of development model responsibility has been pointed out (Muñoz 2016b). As cost externalization tends to full cost externalization, the market structure and the price structure tend towards the market structure and price structure of full unsustainability: this is a world of fully irresponsible markets. On the other hand, as the cost externalization tends to zero the market structure and the price structure of markets tend towards the market structure and the price structure of sustainability markets: this is a world of fully responsible markets. This situation can be appreciated with the help of the cost externalization-sustainability inversegram shown in Figure 1 below:

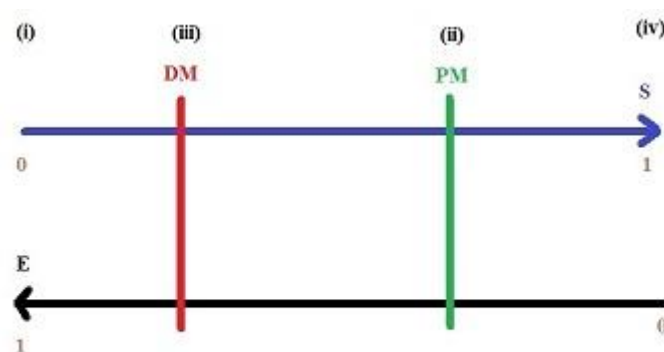


Figure 1. The cost externalization-sustainability inversegram: It allows us to see the points of cost externalization and link them to varying levels of sustainability.

We can appreciate based on Figure 1 above the following: a) Sustainability moves from left to right from full unsustainability ( $S = 0$ ) to full sustainability ( $S = 1$ ) as indicated by the blue arrow or right gram; and b) Cost externalization moves from right to left from no cost externalization ( $E = 0$ ) to full externalization ( $E = 1$ ) as indicated by the black arrow or left gram. Hence, Figure 1 tells us that as cost externalization increases unsustainability increases as model irresponsibility increases; and as cost externalization decreases the sustainability of the system increases as model responsibility increases. In other words, as cost externalization increases market distortions increase; and as cost externalization decreases market distortions decrease.

#### **b) Cost externalization and levels of sustainability**

Figure 1 above also helps us to link cost externalization or market distortions to levels of sustainability as indicated the following four types of markets: a) there are fully unsustainable markets at point (i), where there is full cost externalization: fully irresponsible markets; b) there are partially sustainable markets of the deep market type at point (ii) such as the traditional market, where all but economic costs are externalized: partially responsible markets; c) there are partially sustainable markets of the partnership type at point (iii) such as green markets, where all but economic and environmental costs are externalized: a partially responsible, but more responsible market than the traditional market; and d) there are fully sustainable markets at point (iv) such as the sustainability market, where no externality costs exist: a fully responsible market. Notice in Figure 1 above that as we move away from sustainability markets or as we move to the left of point "iv" in this figure, the level of model responsibility decreases as more cost externalization take place.

It can be said that that the Brundtland Commission in 1987(WCED 1987) was focused on addressing the social and environmental cost externalization aspects associated with the traditional market model in order to lead it towards a more sustainable development structure. In other words, the Brundtland commission was calling for the transformation of the traditional market model into a fully socially and environmentally friendly model, it was calling for a fully responsible development model. Hence, this 1987 Brundtland Commission report started a solution finding process that in 2012 Rio plus 20(UNCSD 2012a; UNCSD 2012b) culminated with the decision to go the way of green markets to account for the environmental costs of doing business, leaving that way the traditional business as usual model behind and moving now towards the adoption and promotion of green economies as stressed by the United Nations Department of Economic and Social Affairs (UNDESA 2012).

Therefore, the 2012 green market solution to the traditional market problem addresses only the environmental cost externalization issue pointed out by the Brundtland commission as only the environmental cost of doing business cannot be externalized anymore. How Adam Smith's traditional market model was affected and left behind by going green was stressed recently(Muñoz 2016c). Hence, the 2012 Rio + 20 conference stressed the urgent need to move away from environmental cost externalization and towards accountability and inclusion by using green market thinking or environmentally friendly market thinking when dealing with or addressing the environmental issues at hand: i) a decision that was welcomed by international organizations such as the World Bank(WB 2012; WB 2015), the United Nations(UN 2012; UN 2015) and the Organisation for Economic Co-operation and Development(OECD 2012; OECD 2014) as well as by key government organizations such as the United States Agency for International Development (USAID 2012) and by global personalities like the Pope(Vatican 2015); and ii) a decision that was later formalized in the 2015 Paris Agreement crafted to address the climate issue(UNFCCC 2015), a green market related issue.

However, the green market solution to the environmental cost externalization problem associated with the traditional market according to perfect green market thinking was environmental cost internalization to close environmental sustainability gaps associated with the pricing mechanism of the traditional market to shift it to green markets, not externality management. But in practice the world has moved away from perfect green market thinking and it has endorsed dwarf green market thinking as the solution to green market problems as we are using externality management programs and policies like carbon pricing to deal with green market issues despite apparently knowing that those are not green market based tools and therefore, apparently knowing that these programs or policies leave the environmental sustainability gap affecting the development issue we are trying to correct still open, remaining as an ongoing source of unsustainability. The fact that academics and policy makers may have started trying to deal with the environmental issue using the wrong green foot soon after 2012 has been recently indicated(Muñoz 2016d); and when they did this, a process of flipping traditional economic thinking in order to fit to the dwarf green market reality was started(Muñoz 2019).

#### **c) The need to understand the link between cost externalization and market structure and market price structure**

As indicated in Figure 1 above the type of cost externalization determines the type of market structure and the price structure of that type of market as well as its degree of responsibility of that market, yet not much

seems to be writing about the market structure and price structure from the cost externalization angle. Therefore, there is a need to understand how cost externalization is linked to market structure, price structure, and market responsibility so as to be able to figure out for example how cost externalization is linked to distorted market prices or linked to the nature of paradigm mergers or linked to the nature of sustainability markets.

Among the goals of this paper are: a) to link cost externalization to all possible market structures and price structures using qualitative comparative means; and b) to show that only when there is no cost externalization there are sustainability markets and sustainability prices.

### Objectives

a) To introduce a cost externalization market structure variability model using qualitative comparative means; b) To link cost externalization to all market structures and price structures possible using this qualitative comparative variability model; c) To show, both analytically and graphically, that when cost externalization increases the unsustainability of the market and its market price increases; d) To stress, both analytically and graphically, that when we move away from cost externalization the sustainability of the market and its market price increases; e) To highlight that market mergers keep the externalized component they have in common as well as the not externalized components in each market when they form a higher level market model; f) To stress that market price mergers keep only the costs of the components that are not externalized only when they form a higher level market price model; and g) To point out that only when there is no cost externalization there are sustainability markets and sustainability prices.

### Methodology

First, the terminology and operational concepts used in this paper are listed. Second, the market structure and cost externalization variability model using qualitative comparative means is introduced. Third, the different types of market structure consistent with this cost externalization variability model are given, both analytically and graphically. Fourth, the different market price structures consistent with each market structure derived from the cost externalization variability model are indicated, both analytically and graphically.

Fifth, the way market structure and price structure are expected to behave or change when there are market and price mergers is stressed analytically and graphically. Sixth, the expectation that as cost externalization tend to zero in any market paradigm we move towards sustainability market structures and sustainability pricing is highlighted. Finally, some food for thoughts and relevant conclusions are shared.

### Terminology

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a = Social cost externalized	A = Social cost not externalized
b = Economic cost externalized	B = Economic cost not externalized
c = Environmental cost externalized	C = Environmental cost not externalized
M = Market	MP = Market price
$M_i$ = Market "i"	$MP_i$ = Market price "i"
SM = Social margin	ECM = Economic margin
EM = Environmental margin	i = Profits
P = Traditional market price	$P = ECM + i$

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### Operational concepts and cost externalization expectation rules

#### A) Operational concepts

1) **Cost externalization**, the leaving out of the pricing mechanism of the market relevant costs associated with production.

2) **Social cost externalization**, the leaving out of the pricing mechanism of the market the social costs associated with production.

- 3) **Environmental cost externalization**, the leaving out of the pricing mechanism of the market the environmental costs associated with production.
- 4) **Economic cost externalization**, the leaving out of the pricing mechanism of the market the economic costs associated with production.
- 5) **Cost externalization assumption neutrality**, the assumption that production has minimal or no cost impact on external factors to a market model.
- 6) **Traditional market**, the economy only market
- 7) **Green market**, the environmentally friendly market
- 8) **Red market**, the socially friendly market
- 9) **Sustainability market**, the socially and environmentally friendly market.
- 10) **Traditional market price**, general market economic only price or the price that covers the cost of production at profit( $TMP = ECM + i = P$ ) or zero profit( $TMP = ECM = P$ ).
- 11) **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.
- 12) **Red market price**, the price that reflects both the economic and social cost of production or the price that covers the costs of socially friendly production.
- 13) **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.
- 14) **Full costing**, the reflecting in the pricing mechanism of the market all cost associated with production; there are no market distortions.
- 15) **Partial costing**, not reflecting in the pricing mechanism of the market all cost associated with production; there are partial market distortions.
- 16) **No costing**, not reflecting in the pricing mechanism of the market any costs associated with production; there is full market distortion.
- 17) **Full inclusion**, all factors are endogenous to the model, there are no exclusions.
- 18) **Partial inclusion**, some factors are exogenous to the model, there are some exclusions.
- 19) **Fully independent development choices**, when we have individual development choices unrelated to each other or pure choices such as society only(A), economy only(B), and environment only(C). In this world only fully independent development choices exist so the set = {A, B, C}. This is the world of the Arrow Impossibility theory and theorem.
- 20) **Partially codependent development choices**, when we have mixed/paired development choices such as socio-economy(AB), socio-environment(AC), and eco-economy(BC). In this universe only codependent development choices exist so the set = {AB, AC, BC}. This is outside the normal world of the Arrow Impossibility theory and theorem.
- 21) **Fully codependent development choices**, when all development choices are mixed together such as the socio-economy-environment(ABC) model. In this paradigm only fully codependent development choices exist so the set = {ABC}. This is outside the world of the Arrow Impossibility theory and theorem.
- 22) **Externalities**, factors assumed exogenous to a model

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

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

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

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

**27) Social margin**, to cover the extra cost of making the business socially friendly.

**28) Economic margin**, to cover only the economic cost of production

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

**B) Cost externalization based expectation rules**

Let us assume that there are three components in market model, social, economic, and environmental components; and therefore, this model has social, economic, and environmental costs associated with production. The externalization or not of these cost of production leads to specific type of market models, and hence, it determines the type of price that clears that market.

Lets the following qualitative comparative information hold true:

d = social cost externalization

D = No social cost externalization

e = Economic cost externalization

E = No economic cost externalization

f = Environmental cost externalization

F = No environmental cost externalization

MSC = Social margin

MECC = Economic margin

MEC = Environmental margin

T<sub>i</sub> = Market T type i

PT<sub>i</sub> = Market price for market T type i

**i) Market model structure expectation**

**Expectation 1:** *The structure of a market T<sub>i</sub> reflects the components of the market where the costs are externalized and as well as the components of the market where the cost that are not externalized.*

Example:

**T<sub>1</sub> = deF-----→ market where only environmental costs are not externalized**

**T<sub>2</sub> = Def-----→ market where only social costs are not externalized**

In other words, the externalization or not of costs in the components of the market determines the structure of a market.

**ii) Market model price structure expectation**

**Expectation 2:** *The price structure PT<sub>i</sub> of a market reflects only the structure of the costs associated with the components that are not externalized.*

Example:

**PT<sub>1</sub> = MEC-----→ Only environmental costs(MEC) are reflected in the pricing mechanism of market T<sub>1</sub>**

**PT<sub>2</sub> = MSC-----→ Only social costs(MSC) are reflected in the pricing mechanism**

**of market T<sub>2</sub>**

In other words, only the costs of components not externalized in a market make up the market price clearing that market.

**iii) Model structure merger expectation**

**Expectation 3:** *When market paradigms merge, the new paradigm structure reflects the components in each model where costs are not externalized as well as the common component present in all models where cost are externalized.*

Example : the case the merger of model T<sub>1</sub> and T<sub>2</sub>:

$$T_3 = T_1.T_2 = (lmN)(Lmn) = LmN$$

Model T<sub>3</sub> reflects the component not externalized in market T<sub>1</sub> and in market T<sub>2</sub>(N and L) as well as the externalized component “m” present or common in both markets.

**iv) Market model price structure merger expectation**

**Expectation 4:** *When market paradigms merge, the new paradigm price structure reflects only the costs associated with the components that are not externalized in the individual markets as the costs of the externalized components in all markets does not matter.*

Example: The market price of the merger of model T<sub>1</sub> and T<sub>2</sub> is PT<sub>3</sub>, which accounts only the cost not externalized in each of them, MSC and MEC respectively.

$$PT_3 = MSC + MEC \text{ since the economic cost of component "m" is externalized.}$$

In other words, the market price of the merger T<sub>3</sub> reflects only the cost of not externalized components in each of the merging markets.

**Market structure and cost externalization variability model**

Based on the existence of cost externalization or not, we can summarize all possible markets with the following formula M:

$$M = a + b + c$$

The formula M above simple says that there is a market M<sub>i</sub> when there is cost externalization in one component only or when there is cost externalization in two components only or when there is cost externalization in all components at the same time. Hence, formula M can be linked to different types of levels of market responsibility or market distortions as indicated below.

**Different forms of market model structure based on variability model M**

The different forms markets can take depends on which type of cost externalization exist affecting the formula M above as explained below, both analytically and graphically.

**a) Analytically:**

There are four types of market structure that can be pointed out based on the type of cost externalization affecting the formula M above: a) Fully unsustainable market structures, if all cost components in formula M are externalized; b) Deep market model structures, if two of the components in formula M are externalized; c) Partial partnership based market structures, if only one component in formula M is externalized; and c) Full partnership based market models, when no component in formula M is externalized, and all these information is summarized in Table 1 below:

**Table 1: Cost externalization and market model structure**

	Type of cost externalized	Model structure
a) Fully unsustainable market structure	a,b,c	$M_1 = abc$
b) Deep market model structures		
Deep socialism model	b,c	$M_2 = Abc$
Deep capitalism model	a,c	$M_3 = aBc$
Deep ecology model	a,b	$M_4 = abC$
c) Partial partnership based models		
Socio-economic model	c	$M_5 = ABc$
Eco-economic model	a	$M_6 = aBC$
Socio-environmental model	b	$M_7 = AbC$
d) Full partnership based models		
True sustainability market model	None	$M_8 = ABC$

The market model information in Table 1 above helps us see i) that as we externalized all cost we create full unsustainability ( $M_1 = abc$ ), a fully distorted market, where chaotic choices rule; and ii) that as we move away from cost externalization from full cost externalization, to two component cost externalization, to one component cost externalization, and then to no externalization we move towards the sustainability market structure ( $M_8 = ABC$ ), markets with no distortions, where fully codependent choices rule; and c) that this information is consistent with the expectations created by the cost externalization-sustainability inversegram shared in Figure 1 in the introduction above: the less cost externalization takes place the more sustainable the markets are (going from  $M_1$  to  $M_8$ ); and the more cost externalization takes place the more unsustainable the systems are as there are more distortions (going from  $M_8$  to  $M_1$ ).

We can also see that only when there is no cost externalization we have sustainability markets ( $M_8 = ABC$ ), fully responsible markets; and only when we have full externalization we have fully unsustainable markets ( $M_1 = abc$ ), fully irresponsible markets.

**b) Graphically**

The different forms of market structures listed in Table 1 above can be represented graphically as done in Figure 2 below:

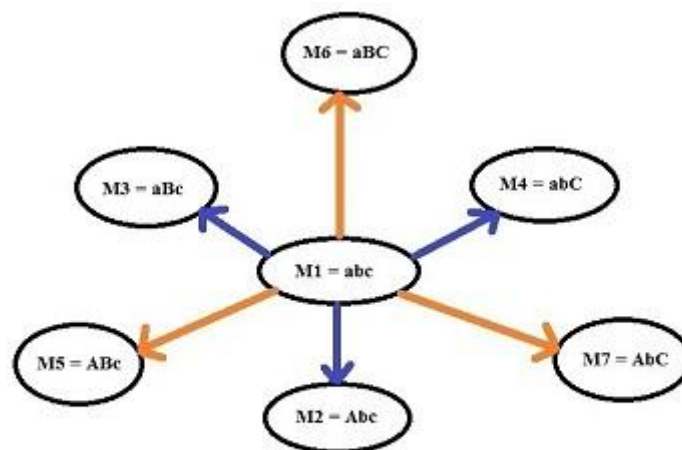


Figure 2 The world of cost externalization and model structure: There is full externalization at the center; there is deep paradigms externalization in models linked by blue arrows; and there is partnership based externalization in models linked by the red arrows.

We can see the following in Figure 2 above: a) there is full externalization and therefore full unsustainability at the centre ( $M_1 = abc$ ); this is the world of chaotic choices; b) there are three models connected

by blue arrows which are deep market thinking based models, where two types of cost are externalized, the red socialist model( $M_2 = Abc$ ), the traditional economic model( $M_3 = aBc$ ), and the deep ecology or environmental model( $M_4 = abC$ ): these are worlds of independent choices; and c) there are three partial partnership based model, where only one type of cost is externalized, the socio-economic model ( $M_5 = ABC$ ), the eco-economic model or green market model( $M_6 = aBC$ ) and the socio-ecology or socio-environmental model( $M_7 = AbC$ ): these are worlds of partially codependent choices.

Finally, we appreciate in Figure 2 above that as we move away from full unsustainability at the centre  $M_1 = abc$  towards the deep thinking models associated to blue arrows and/or towards the partial partnership models associated to red arrows we move towards more sustainable market model configurations. In other words, we can see in Figure 2 the following: i) that more externalization means more distortions and therefore, more unsustainability, and ii) that less cost externalization indicates less distortions and hence, more sustainability.

**Linking market structure and market pricing**

The different forms of market structure in Table 1 above can be linked to price structure by observing that the costs that are externalized are not reflected in the pricing mechanism of a market, and that only the costs that are not externalized form the body of the market price, which is consistent with expectation 4: Market price merging expectation, and how this works is indicated below, both analytically and graphically:

**a) Analytically**

Table 2 below links analytically each model structure in Table 1 above with its corresponding market price, where the price of each markets reflects only the costs associated with the components of that market that are not externalized, they are the costs that are accounted for in each market.

**Table 2: Market model structure and price structure**

	Model structure	Price Structure
a) Fully unsustainable market structure	$M_1 = abc$	$PM_1 = 0$
b) Deep market model structures		
Deep socialism model	$M_2 = Abc$	$PM_2 = SM$
Deep capitalism model	$M_3 = aBc$	$PM_3 = P$
Deep ecology model	$M_4 = abC$	$PM_4 = EM$
c) Partial partnership based models		
Socio-economic model	$M_5 = ABC$	$PM_5 = SM + P$
Eco-economic model	$M_6 = aBC$	$PM_6 = P + EM$
Socio-environmental model	$M_7 = AbC$	$PM_7 = SM + EM$
d) Full partnership based models		
True sustainability market model	$M_8 = ABC$	$PM_8 = SM + P + EM$

The market model information in Table 2 above helps us see what costs need to be left out and which cost must be accounted for in the pricing mechanism of each market. For example, when there is full externalization( $M_1 = abc$ ), the market price is zero( $MP_1 = 0$ ); and when there is no externalization( $M_8 = ABC$ ), the market price is a full price( $MP_8 = SM + P + EM$ ).

We can also appreciate from the information in Table 2 above that when we move from full externalization to no externalization(from  $M_1$  to  $M_8$ ) the market price increases and the sustainability of the system increases as cost distortions are corrected; and when we go from no externalization to full externalization(from  $M_8$  to  $M_1$ ) the market price decreases and the unsustainability of the system increases as cost distortions are introduced. In other words, less cost externalization means higher market prices; and more cost externalization means lower market prices.



**b) Graphically**

The different forms of market structures and their associated market prices shared in Table 2 above can be represented graphically as shown in Figure 3 below:

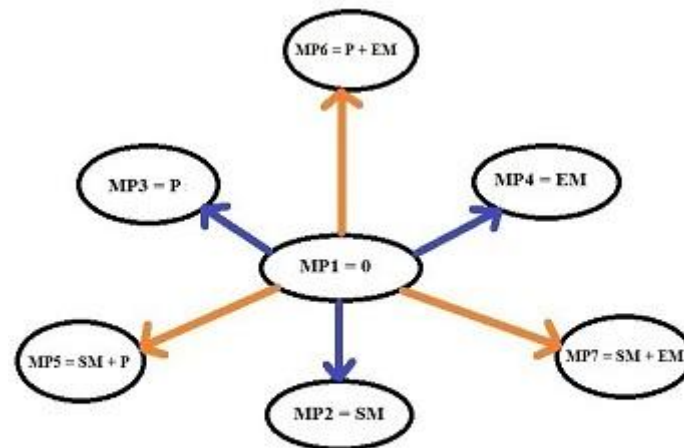


Figure 3 The world of cost externalization and price structure: There is zero price at the center; there is deep paradigm pricing in models linked by blue arrows; and there is partnership based pricing in models linked by red arrows

We can extract from Figure 3 above the following information: a) that there is full externalization, full irresponsibility, and therefore, full unsustainability at the center ( $M_1 = abc$ ), where the market price is zero ( $MP_1 = 0$ ); b) that there are three models connected by blue arrows and they are all deep market thinking based models, where two types of cost are externalized, and therefore, only one cost is accounted for, the red socialist model ( $M_2 = Abc$ ), where the market price is  $MP_2 = SM$ , the traditional economic model ( $M_3 = aBc$ ), where the market price is  $MP_3 = P$ , and the deep ecology or environmental model ( $M_4 = abC$ ), where the market price is  $MP_4 = EM$ ; and c) that there are three partial partnership based models connected by red arrows, where only one type of cost is externalized, the socio-economic model ( $M_5 = ABc$ ), where the market price is  $MP_5 = SM + P$ , the eco-economic model or green market model ( $M_6 = aBC$ ), where the market price is  $MP_6 = P + EM$ ; and the socio-ecology or socio-environmental model ( $M_7 = AbC$ ), where the market price is  $MP_7 = SM + EM$ .

Finally, we appreciate in Figure 3 above that as we move away from full unsustainability at the center  $M_1 = abc$ , where market price is  $MP_1 = 0$  towards the deep thinking models associated to blue arrows, where prices reflect the cost associated with the component not externalized and/or towards partial partnership models associated to red arrows, where prices reflect the costs associated with all components not externalized, we move towards more sustainable, more responsible market pricing configurations. In other words, more sustainable, more responsible market prices are associated with decreasing cost externalization or with decreasing unsustainability or with decreasing market distortions.

**Linking cost externalization and market paradigm mergers**

When two or more market merge, there are win-win situations; and this new market reflects in its structure the components in each merging market that are not externalized well as the component in all merging markets that is externalized, a situation highlighted in Figure 4 below in the case of merger  $M_5 = M_2.M_3$ , merger  $M_6 = M_3.M_4$ , and merger  $M_7 = M_2.M_4$ :

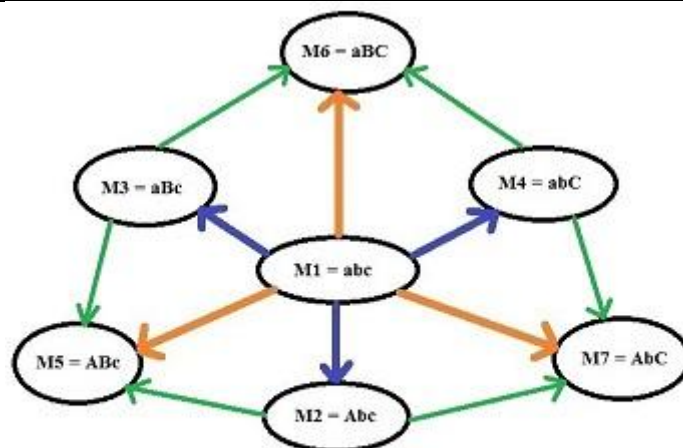


Figure 4 The world of cost externalization and paradigm mergers under win-win situations: Deep models linked by the blue arrows can clash with each other and merge keeping their common externalization components intact under win-win conditions as indicated by the meeting of green arrows

We can appreciate from Figure 4 above how market paradigm mergers worked when combining lower level markets to form higher-level markets: a) The case of the socio-economic market ( $M_5 = ABc$ ): It comes from combining the red socialist market ( $M_2 = Abc$ ) with the traditional economic market ( $M_3 = aBc$ ) since  $M_2.M_3 = (Abc)(aBc) = ABc = M_5$ ; b) the case of the eco-economic market or green market ( $M_6 = aBC$ ): It arrives when combining the traditional market ( $M_3 = aBc$ ) with the deep ecology market ( $M_4 = abC$ ) since  $M_3.M_4 = (aBc)(abC) = aBC = M_6$ ; and c) the case of the socio-environmental market ( $M_7 = AbC$ ): It results from combining the red socialist market ( $M_2 = Abc$ ) with the deep ecology market ( $M_4 = abC$ ) since  $M_2.M_4 = (Abc)(abC) = AbC = M_7$ .

We can see in Figure 4 above too the following: i) that merged models like  $M_5$ ,  $M_6$ , and  $M_7$  have a more sustainable market structure than the market structure of the deep thinking development models that generates them as partnerships based model have fewer market distortions or less cost externalization; and ii) that merged models also are worlds where partial codependent choice rules.

### Linking cost externalization and market pricing mergers

When two or more paradigms merge under win-win conditions they keep the cost that are not externalized and leave out the costs that are externalized when forming the merged market price, a situation highlighted in Figure 5 below in the case of market price of the partnership  $M_5$ ,  $M_6$ , and  $M_7$ , which are  $MP_5$ ,  $MP_6$ , and  $MP_7$  respectively:

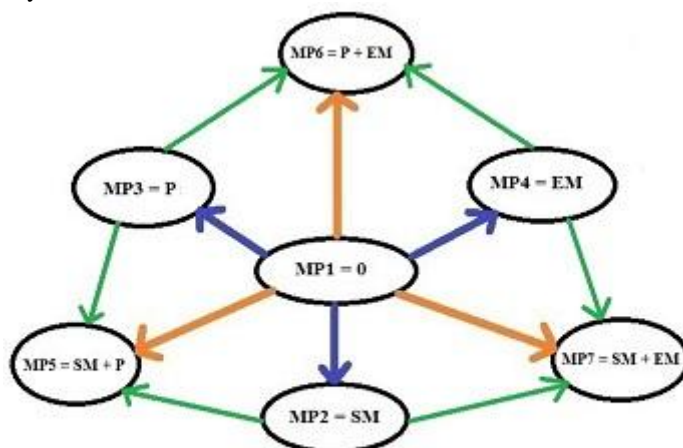


Figure 5 The world of cost externalization and price mergers under win-win situations: Deep model pricing linked by the blue arrows when clashing merge keeping the common externality cost out under win-win conditions as indicated by the meeting of green arrows.

We can see based on Figure 5 above a) that the price structure of the socio-economic market  $MP_5 = SM + P$  comes from keeping or adding the costs associated with the components that are not externalized in each of its merging markets with blue arrows, the red socialism market  $MP_2 = SM$  and the traditional market  $MP_3 = P$ ; b) that the price structure of the eco-economic market  $MP_6 = P + EM$  comes from keeping or adding the costs associated with the components that are not externalized in each of its merging markets with blue arrows, the traditional market  $MP_3 = P$  and the ecological or environmental market  $MP_4 = EM$ ; and c) that the price structure of the socio-ecological or socio-environmental market  $MP_7 = SM + EM$  comes from keeping or adding the costs associated with the components that are not externalized in each of its merging markets, the red socialism market  $MP_2 = SM$  and the ecological or environmental market  $MP_4 = EM$ .

We can also appreciate in Figure 5 above that that prices of merged markets like  $M_5$ ,  $M_6$ , and  $M_7$  are higher than the prices of each of the deep thinking markets that generates them as they have fewer market cost distortions.

### The road towards sustainability market structures as we move away from cost externalization

As we move away from cost externalization, we move towards the model structure of sustainability markets ( $M_8 = ABC$ ), a fully responsible model, as highlighted in Figure 6 below:

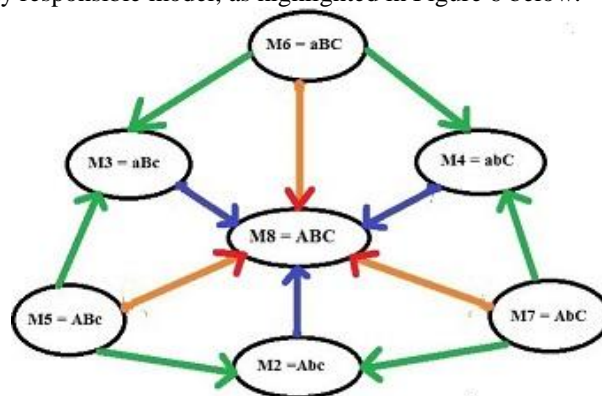


Figure 6 The road towards sustainability model structures: As we move away from cost externalization to no cost externalization all market models shift towards the sustainability market structure  $M_8 = ABC$

Figure 6 above allows us to see a) that at the centre, there is no cost externalization as no component is externalized ( $M_8 = ABC$ ); and b) that no matter which way we go, the end of cost externalization in partnership based models or the end of cost externalization in deep market structure models or the end of cost externalization in fully unsustainable markets leads to sustainability markets  $M_8 = ABC$ , markets where cost externalization does not exist as they are based on full cost inclusion, reflecting that way full responsibility. In other words, a move away from cost externalization to no cost externalization leads to sustainability market structures, market structures with no model distortions, where fully codependent choices rule. Hence, the road of any non-fully sustainable market leads to sustainability market structures when cost externalization ends.

### The road towards sustainability pricing as we move away from cost externalization

As we move away from cost externalization we move towards the price structure of sustainability markets ( $MP_8 = SM + P + EM$ ), as highlighted in Figure 7 below:

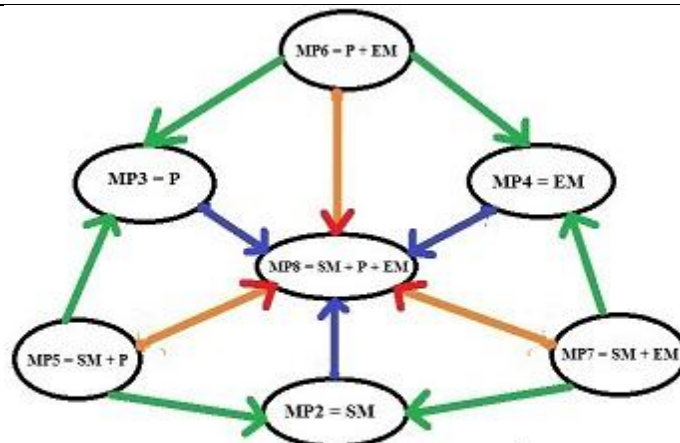


Figure 7 The road towards sustainability market pricing: As we move away from cost externalization to no cost externalization all market prices shift towards sustainability market pricing  $MP_8 = SM + P + EM$

Figure 7 lets us appreciate that a) at the center there are sustainability prices ( $MP_8 = SM + P + EM$ ); and b) no matter which way we go, the end of cost externalization in partnership based models or in deep market structure models or in fully unsustainable models leads to sustainability market pricing  $MP_8 = SM + P + EM$ , market prices where cost externalization does not exist as these prices are based on full cost accounting. In other words, a move away from cost externalization to no cost externalization leads to sustainability market pricing structures, prices with no cost distortions. Therefore, the road leads also to sustainability market pricing when cost externalization ends.

### Food for thoughts

a) Is the price of fully unsustainable market  $MP_1 = 0$  consistent with perfect market competition theory and expectations? I think yes, what do you think?; b) When there are no production costs, should we expect over production and over consumption to take place and lead to system collapse? I think yes, what do you think?; c) Can true sustainability exist without full cost accounting? I think no, what do you think?; d) Is cost externalization at the heart of sustainability gaps? I think yes, what do you think?; and e) Is increasing cost externalization associated with increasing market irresponsibility? I think yes, what do you think?

### Conclusions

First, it was shown that the qualitative comparative based cost externalization market variability model is very helpful in linking different market structures to specific types of cost externalization configurations. Second, it was stressed that market models under full cost externalization are fully unsustainable markets or fully irresponsible; and market models under no cost externalization are fully sustainable markets or fully responsible. Third, it was explained how the cost externalization structure of each market model is linked to associated market prices. Fourth, it was stressed that fully unsustainable markets have a market price of zero ( $MP_1 = 0$ ); and that fully sustainable markets have a full cost based price ( $MP_8 = SM + P + EM$ ).

Fifth, it was indicated that when paradigms merge, the resulting market model structure keeps the components in merging models that are not externalized as well as the common component externalized. Sixth, it was pointed out that when market paradigms merge, the resulting market price structure in all models keeps only the costs associated with the components of the merging markets that are not externalized, as the cost associated with common externalized components does not matter. Finally, it was indicated that the road leads to sustainability market structures or fully responsible markets; and therefore, to sustainability market pricing at the end of any type of non-full sustainability market when it eliminates its cost externalization behavior.

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