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Ceteris Paribus 104: Using the Golden paradigm-Flawed paradigm framework to reveal the nature of positive and negative Pareto optimality dynamics: Implications for the correction or expansion of distortions in the Traditional market model of Adam Smith

By

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Abstract

The space between the golden paradigm optimality point and the flawed paradigm optimality point can be understood as a space in which positive and negative Pareto optimality dynamics take place. Positive Pareto optimality trends refer to movements toward the golden paradigm optimality point driven by increasing cost internalization, whereas negative Pareto optimality trends refer to movements away from the golden paradigm optimality point. Golden paradigms represent markets without sustainability gaps, while flawed paradigms represent markets with sustainability gaps. As positive and negative Pareto optimality movements take place along the section of the demand curve between the golden Pareto point and the flawed Pareto point, positive Pareto optimality trends occur along the increasing sustainability Pareto optimality line, whereas negative Pareto optimality trends occur along the decreasing sustainability Pareto optimality line. Understanding the nature of positive and negative Pareto optimality trends can help explain how distorted paradigms can be corrected or, alternatively, how existing distortions can be expanded. Since both the traditional market model associated with Adam Smith and the circular market model being promoted today operate with socio-environmental sustainability gaps, the theory of positive and negative Pareto optimality dynamics applies to both as different forms of flawed paradigms. The two main goals of this paper are, first, to introduce the concepts of positive and negative Pareto optimality dynamics and show how they can be used to identify actions that contribute either to sustainability problem-solving or to sustainability problem-worsening; and second, to apply the theory of positive and negative Pareto optimality dynamics to demonstrate how socio-environmental sustainability problems can be solved fully or partially, as well as how they can instead be worsened under traditional market thinking and circular traditional market thinking.

Objectives

i) To introduce the concepts of positive and negative Pareto optimality dynamics and show how they can be used to identify actions that contribute either to sustainability problem-

solving or to sustainability problem-worsening; and ii) To apply the theory of positive and negative Pareto optimality dynamics to demonstrate how socio-environmental sustainability problems can be solved fully or partially, as well as how they can instead be worsened under traditional market thinking and circular traditional market thinking.

Methodology

First, the terminology used is given. Second, the golden paradigm-flawed paradigm framework in terms of sustainability gaps is introduced. Third, the golden paradigm-flawed paradigm framework in terms of Pareto optimality gaps is established. Fourth, the idea of the Pareto optimality dynamics space is stressed. Fifth, the nature of the frontiers of the Pareto optimality dynamic space is addressed. Sixth, the nature of negative Pareto optimality trends is pointed out. Seventh, the nature of positive Pareto optimality trends is described. Eighth, the critical sustainability problem-solving issue is linked to the positive and negative Pareto optimality dynamics theory. Ninths, the negative Pareto optimality dynamics ideas is connected to the working of Traditional markets a la Adam Smith. Tenth, the critical the socio-environmental sustainability problem-solving issue associated with the working of the traditional market is addressed from the point of view of positive and negative Pareto optimality dynamics theory. Eleventh, the move to the circular traditional economy from the linear traditional economy is explained as a negative Pareto optimality dynamics move. And finally, twelfths, some relevant conclusions are provided.

Terminology

P = Price Q = Quantify

D = Demand TM = Traditional market

TMP = Traditional market price TMQ = Traditional market quantity

TMS = Traditional market supply TMSG = Traditional market sustainability gap

CTMSG = Circular traditional market sustainability gap

TMPOG = Traditional market Pareto optimality gap

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FPO = Full Pareto optimality PPO = Partial Pareto optimality

CTM = Circular traditional market CTMS = Circular traditional market supply

CTMP = Circular traditional market price CTMQ = Circular traditional market quantity

CTMPOG = Circular traditional market Pareto optimality gap

POG = Pareto optimality gap NPOG = No Pareto optimality gap

GOP = Golden market paradigm NSG = No sustainability gap

FLP = Flawed market paradigm SG = Sustainability gap

GOP-FLP framework = Golden paradigm-Flawed paradigm framework

GOPMS = Golden paradigm market supply FLPMS = Flawed paradigm market supply

GOPMQ = Golden paradigm market quantity

FLPMQ = Flawed paradigm market quantity

GOPMP = Golden paradigm market price FLPMP = Flawed paradigm market price

GOPSG = Golden paradigm sustainability gap

FLPSG = Flawed paradigm sustainability gap FCI = Full cost internalization

PCI = Partial cost internalization FCE = Full cost externalization

PCE = Partial cost externalization DMP = Distorted market price

NDMP = No distorted market price GOPOP = Golden paradigm optimality point

FLPOP = Flawed paradigm optimality point TMOP = Traditional market optimality point

CTMOP = Circular traditional market optimality point

GOPPOG = Golden paradigm Pareto optimality gap

FLPPOG = Flawed paradigm Pareto optimality gap FC = Full correction

PC = Partial correction DE = Distortion expansion

PODS = Pareto optimality dynamics space POT = Pareto optimality trend

NPOT = Negative Pareto optimality trend PPOT = Positive Pareto optimality trend

POGi = Pareto optimality gap type “i” PPOi = Partial Pareto optimality type “i”

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FCP = Full cost pricing PCP = Partial cost pricing

The golden paradigm-flawed paradigm framework in terms of sustainability gaps

The golden paradigm (GOP)-flawed paradigm (FLP) framework idea was introduced recently (Munoz 2026) in terms of full cost pricing (FCP) and partial cost pricing (PCP) to highlight the sustainability gaps (SG) or Pareto optimality gaps (POG) that separates flawed paradigms (FLP) or partial cost pricing (PCP) paradigms from golden paradigms (GOP) or full cost pricing (FCP) paradigms, a situation that can be summarized as indicated in Figure 1 below:

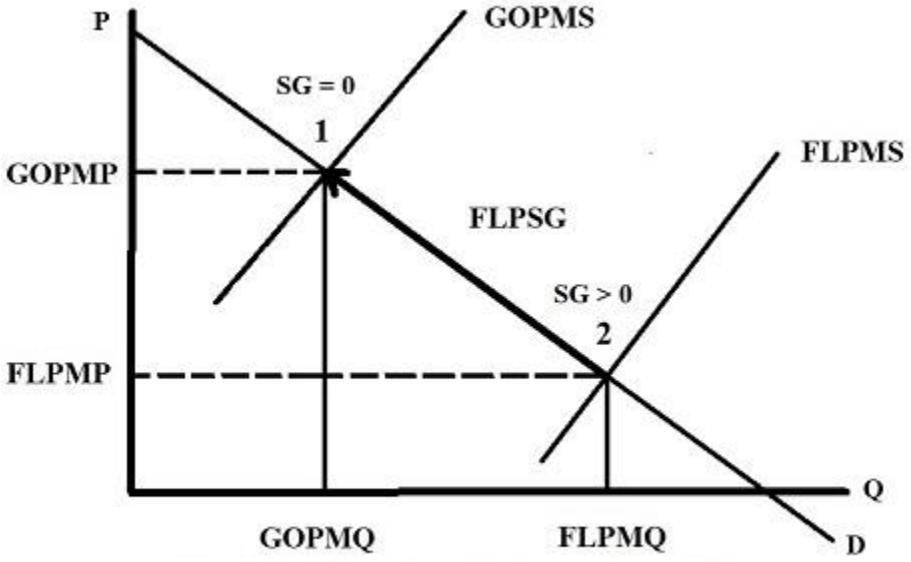

Figure 1 The golden market paradigm-Flawed market paradigm framework under reality in terms of sustainability gaps

Figure 1 above shows the golden paradigm (GOP)-Flawed paradigm (FLP) framework under no sustainability gap production neutralities assumptions. It tells us that golden paradigms represent markets without sustainability gaps such as point 1 as here there is full cost internalization (FCI), while flawed paradigms represent markets with sustainability gaps such as point 2 as here there is partial cost internalization (PCI). Moreover, Figure 1 above shows that there is a flawed paradigm market sustainability gap (FLPSG) separating the flawed paradigm (FLP) from the going paradigm (GOP), given by the difference between their market prices so that FLPSPG = GOPMP – FLPMP. The expansion and contractions of golden paradigms (GOP) at point 1 are optimal expansions and contractions as golden paradigm market prices (GOPMP) are not distorted market prices (NDMP) while the expansions and contractions of flawed

paradigms (FLP) are non-optimal expansions and contractions as flawed paradigm market prices (FLPMP) here are distorted prices (DMP).

In summary, at Point 1 or Golden paradigm (GOP) point we have i) full cost pricing, ii) full resource allocation efficiency, iii) full Pareto optimality, and iv) no sustainability gap; and at Point 2 or Flawed paradigm (FLP) point we have i) partial cost pricing; ii) partial resource allocation efficiency; iii) partial Pareto optimality; and sustainability gap, and the space between point 1 and point 2 is where sustainability gap dynamics are at play.

Implication 1

The golden paradigm-flawed paradigm framework under reality points out the existence of a flawed paradigm sustainability gap (FLPSG = GOPMP – FLPMP).

The golden paradigm-flawed paradigm framework in terms of Pareto optimality gaps

No distorted market prices (NDMP) in golden paradigm (GOP) means that at point 1 there is full Pareto optimality (FPO) and distorted market prices (DMP) in flawed paradigms (FLP) indicates that there is partial Pareto optimality (PPO) at point 2, a situation summarized in Figure 2 below:

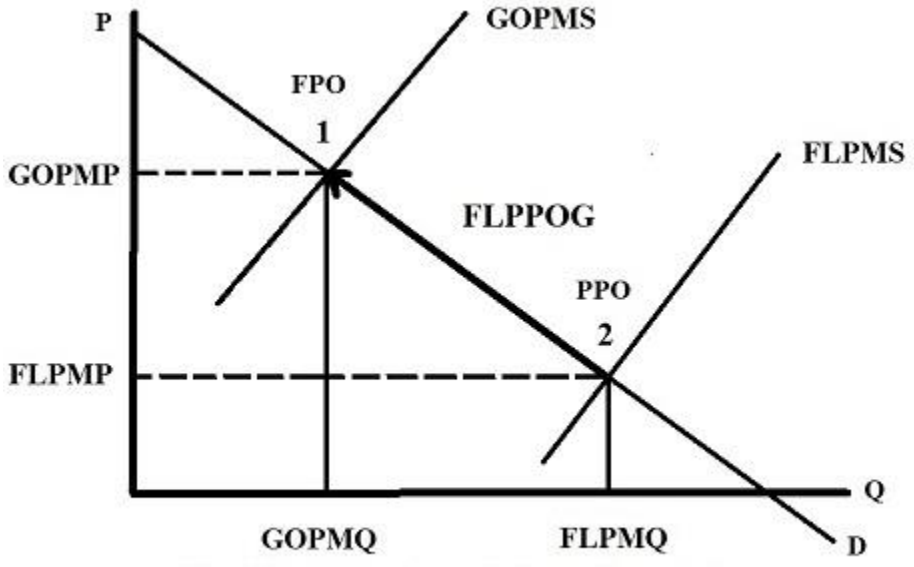

Figure 2 The golden market paradigm-Flawed market paradigm framework under reality in terms of Pareto optimality gaps

Hence, golden paradigms (GOP) at point 1 represent markets without Pareto optimality gaps (NPOG), while flawed paradigms (FLP) at point 2 reflect markets with Pareto optimality

gaps (POG). In other words, the flawed market paradigm sustainability gap (FLPSG) is a flawed market paradigm Pareto optimality gap (FLPPOG); and therefore, FLPSG = FLPPOG. And this means that the flawed market paradigm Pareto optimality gap (FLPPOG) is the difference between full Pareto optimality (FPO) at point 1 and partial Pareto optimality (PPO) at point 2 so that FLPPOG = FPO – PPO.

In summary, again at Point 1: Golden paradigm (GOP) point we have i) full cost pricing, ii) full resource allocation efficiency, iii) full Pareto optimality, and iv) no sustainability gap; and at Point 2: Flawed paradigm (FLP) point we have i) partial cost pricing; ii) partial resource allocation efficiency; iii) partial Pareto optimality; and sustainability gap, and the space between point 1 and point 2 is where Pareto optimality gap dynamics are at play.

Implication 2

The golden paradigm-flawed paradigm framework under reality highlights the existence of a flawed paradigm optimality gap (FLPPOG = FPO - PPO).

The Pareto optimality dynamics space

Therefore, the space between the golden paradigm optimality point (GOPOP) at point 1 and the flawed paradigm optimality point (FLPOP) at point 2 can be understood as a space in which positive and negative Pareto optimality dynamics take place as this space can be seen as a dynamic continuum, up or down, a situation displayed in Figure 3 below:

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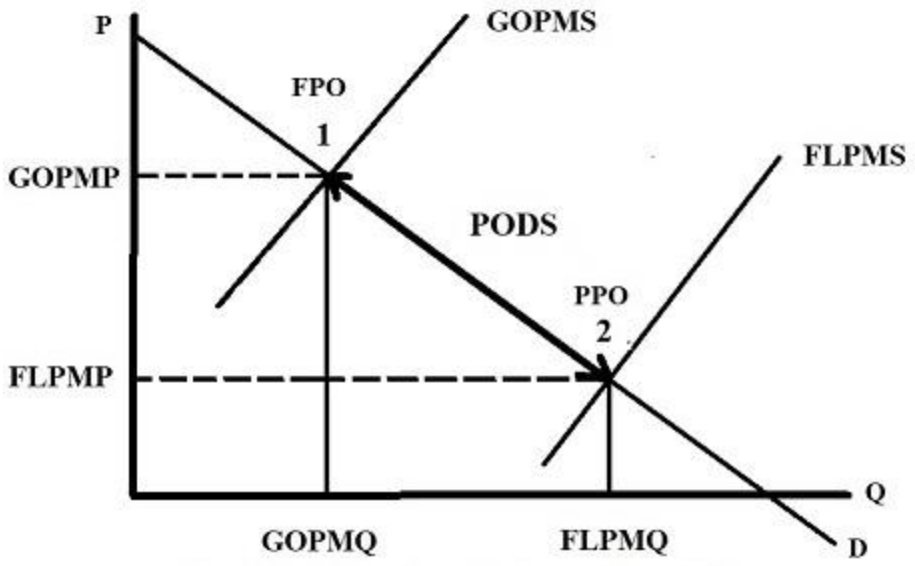

Figure 3 The Pareto optimality dynamcics space

Figure 3 above indicates that the Pareto optimality dynamics space (PODS) occupies the distance point 1-point 2 = distance point 2 – point 1, as optimality dynamics can be positive or negative depending on whether they move towards or away of point 1 respectively. In other words is the dynamic continuum moves upwards and towards point 1 is a positive continuum becoming the increasing sustainability Pareto optimality line, but if it moves downwards and away from point 1 is a negative continuum becoming the decreasing Pareto optimality sustainability line. Ideas on the nature of the Pareto optimality line have been recently shared (Muñoz 2021) summarized in the following chains: a) **Increasing sustainability Pareto optimality line → movement toward GOPOP → positive Pareto optimality dynamics;** and **b) Decreasing Pareto optimality sustainability line → movement away from GOPOP → negative Pareto optimality dynamics.**

Implication: 3

The Pareto optimality dynamics space is the area between the golden paradigm market price and the flawed paradigm market price.

The nature of the frontiers of the Pareto optimality dynamic space

If we take the golden paradigm (GOP) at point 1 as the upper frontier of the Pareto optimality dynamics space (PODS), and the flawed paradigm point 2 as the lower frontier, then the following considerations expressed in Figure 4 below are possible:

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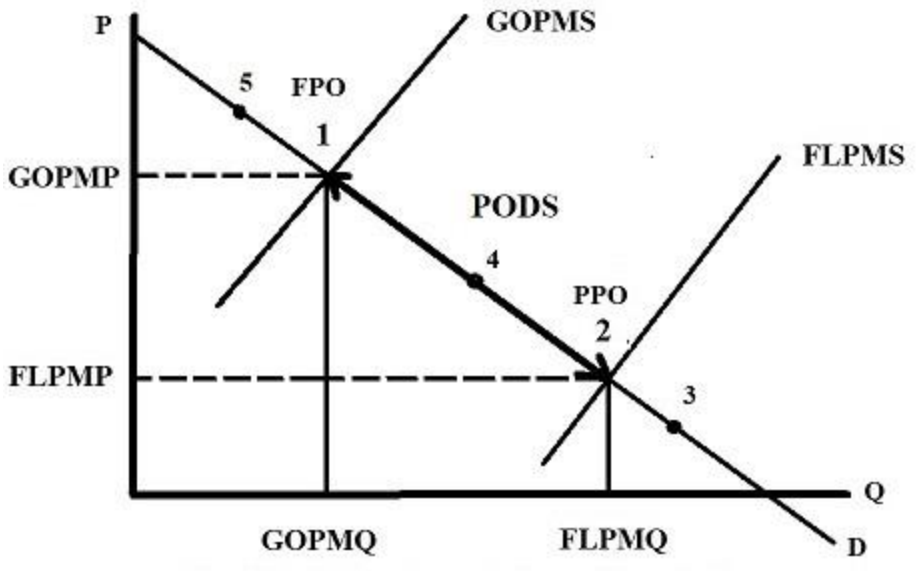

Figure 4 The nature of the frontiers of the Pareto optimality dynamics spce

Figure 4 above helps us see the following situations: a) Golden paradigms can contract from point 1 to point 5 and they can expand from point 1 to point 4 maintaining in both cases full Pareto optimality (FPO) as a consequence of the expansion and contraction of full costing: In other words, the expansion and contractions in golden paradigms (GOP) are optimal contractions and expansions; b) Flawed paradigms can contract from point 2 to point 4 and they can expand from point 2 to point 3 maintaining in both cases partial Pareto optimality (PPO) as a consequence of the expansion and contraction of partial costing: In other terms, the expansion and contractions in flawed paradigms (FLP) are non-optimal contractions and expansions; and c) a movement from point 4 to point one is a positive Pareto optimality movement as it is a movement from partial Pareto optimality to full Pareto optimality; and a movement from point 4 to point 2 is a negative Pareto optimality movement since it is a movement from higher partial Pareto optimality to lower partial Pareto optimality.

In summary, contraction from point 1 to point 5 and expansion from point 1 to point 4 means in Golden paradigm (GOP) means we have i) contractions and expansions of full cost pricing, ii) contractions and expansions of full resource allocation efficiency, iii) contractions and expansions of full Pareto optimality, and iv) no sustainability gap; and contractions from point 2 to point 4 and expansions from point 2 to point 3 in Flawed paradigm (FLP) indicates that we have i) contractions and expansions of partial cost pricing; ii) contractions and expansions of partial resource allocation efficiency; iii) contractions and expansions of partial Pareto optimality; and contractions and expansions of sustainability gap, and the space between point 1 and point 2 and their contractions and expansions is where cost pricing gap dynamics, sustainability gap dynamics, Pareto optimality gap dynamics, resource allocation efficiency gap dynamics are at play.

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Implication: 4

Expansions and contractions of golden paradigms are optimal (they are all full Pareto optimality points) and expansions and contractions of flawed paradigms are non-optimal (they are all partial Pareto optimality points).

The nature of negative Pareto optimality trends

Negative Pareto optimality trends (NPOT) refer to movements away from the golden paradigm optimality point at point 1 driven by increasing cost externalization or decreasing cost internalization: a movement towards full unsustainability, a situation indicated in Figure 5 below by the blue arrow moving left to right:

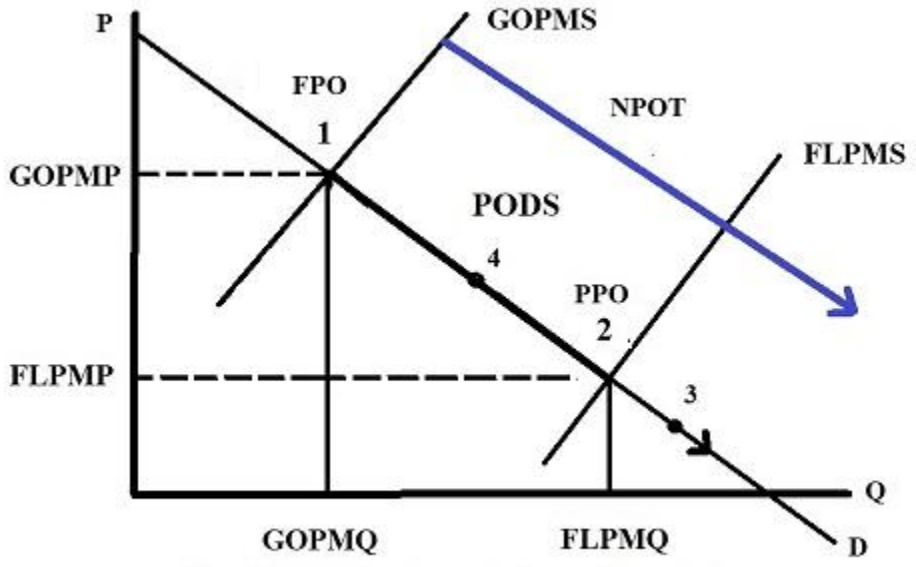

Figure 5 The nature of negative Pareto optimality dynamics

Figure 5 above indicates that Pareto optimality points such as point 4, point 2 and point 3 create a movement from higher partial Pareto optimality points to lower partial Pareto optimality points, a hence a trend towards higher unsustainability points. As the negative Pareto optimality movement in Figure 5 above takes place along the section of the demand curve between the golden Pareto point 1 and the flawed Pareto point 2 in the direction of higher unsustainability, then the negative Pareto optimality trend occur along the decreasing Pareto optimality sustainability line. In other words, the demand section pointing away from the full Pareto optimality point becomes the decreasing Pareto optimality sustainability line, the line that links all decreasing Pareto optimality points.

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In summary, negative Pareto optimality dynamics trends are negative sustainability dynamics trends as they are movements away from the golden paradigm as shown in Figure 5 above, a situation which can be summarize by the following chain form:

Full cost pricing → increasing cost exclusion/externalization → partial cost pricing → expanding Pareto optimality gap/sustainability gap → declining resource allocation efficiency

The chain above highlights that between the golden paradigm and the flawed paradigm exists a transition space where changes in pricing structures can generate negative dynamics in sustainability gaps, Pareto optimality gaps, and resource allocation efficiency.

Implication: 5

Negative Pareto optimality dynamics trends bring distorted flawed paradigms away from true sustainability or to point 1as they expand as they sit on the decreasing Pareto optimality sustainability line.

The nature of positive Pareto optimality trends

Positive Pareto optimality trends (PPOT) refer to movements towards the golden paradigm optimality point at point 1 driven by decreasing cost externalization or increasing cost internalization: a movement towards full sustainability, a situation depicted in Figure 6 below by the blue arrow moving right to left:

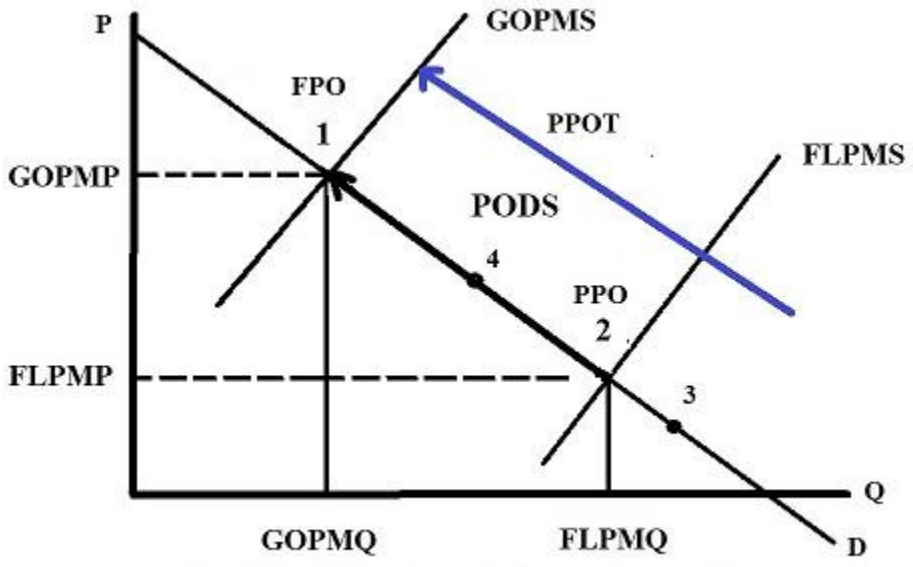

Figure 6 The nature of positive Pareto optimality dynamics

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Figure 6 above indicates that Pareto optimality points such as point 3, point 2 and point 4 create a movement from lower partial Pareto optimality points to higher partial Pareto optimality points, a hence a trend towards higher sustainability points. As the positive Pareto optimality movement in Figure 6 above takes place along the section of the demand curve between the golden Pareto point 1 and the flawed Pareto point 2 in the direction of higher sustainability, then the positive Pareto optimality trend occur along the increasing Pareto optimality sustainability line. In other words, the demand section pointing towards the full Pareto optimality point becomes the increasing Pareto optimality sustainability line, the line that links all increasing Pareto optimality points.

In summary, positive Pareto optimality dynamics trends are positive sustainability dynamics trends as they are movements towards the golden paradigm as shown in Figure 6 above, a situation which can be summarize by the following chain form:

Partial cost pricing → increasing cost inclusion/internalization → full cost pricing → closing Pareto optimality gap/sustainability gap → full resource allocation efficiency

The chain above indicates that between the golden paradigm and the flawed paradigm exists a transition space where changes in pricing structures can generate positive dynamics in sustainability gaps, Pareto optimality gaps, and resource allocation efficiency.

Implication: 6

Positive Pareto optimality dynamics trends bring distorted flawed paradigms closer to or fully to true sustainability or to point 1as they contract as they sit on the increasing Pareto optimality sustainability line.

Linking critical sustainability problem-solving issue and positive and negative Pareto optimality dynamics theory

Understanding the nature of positive Pareto optimality trends (PPOT) and negative Pareto optimality trends (NPOT) can help explain how distorted paradigms can be corrected or, alternatively, explain how existing distortions can be expanded or made worse. Figure 7 below shows the actions that lead to the partial correction (PC), full correction (FC) or distortion expansion (DE) in the case of addressing the critical problems linked to the working of distorted flawed market paradigms (FLP):

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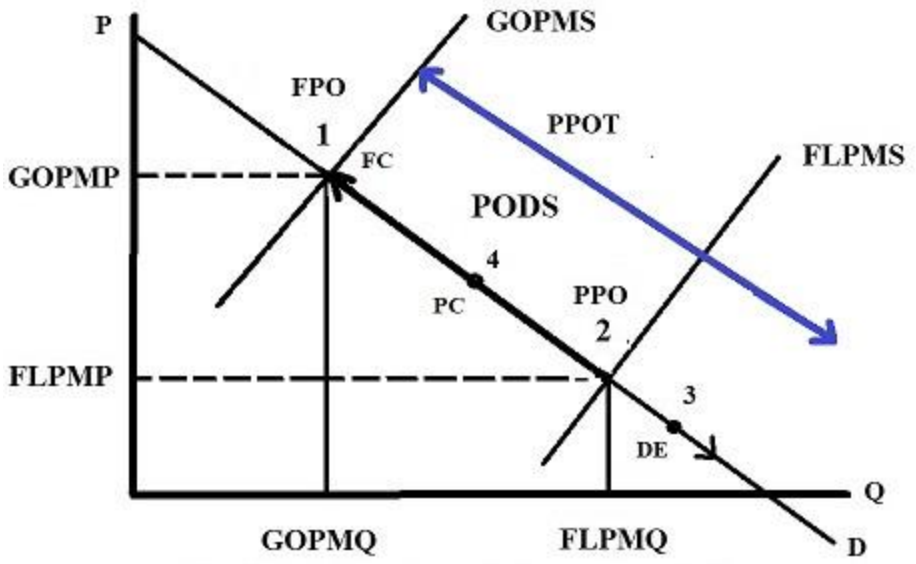

Figure 7 Linking full and partial distortion corrections and distortions expansions with positive and negative Pareto optimality dynamics theory

At point 2 in Figure 7 above we have a distorted flawed market paradigm (FLP), producing and consuming the quantity FLPMQ cleared at the price FLPMP, which has a sustainability gap (SG) that goes from point 2 to point 1 as indicated by the black arrow on the demand curve going from right to left. Point 1 indicates a point of full correction (FC) where all costs associated with production in flawed paradigms (FLP) are now internalized and the sustainability gap is fully closed (SG = 0). Point 4 shows a point of partial correction (PC) more costs associated with production in flawed markets that at point 2 are now accounted for leading to a higher price and lower consumption than at point 2, a point still under remaining sustainability gaps (SG > 0) equal to the distance from point 4 to point 1. Both the partial correction (PC) and the full correction (FC) are positive Pareto optimality moves as they follow the direction of positive Pareto optimality trends (PPOT). Point 3 in Figure 7 above on the other hand is a point of distortion expansion (DE) as point 3 is a point lower Pareto optimality than point 2, a point that expands the existing Pareto optimality gap (POG) at point 2 since POG3 > POG2.

In summary, Figure 7 above helps us to identify the following chain implications with respect to the correction of distorted flawed market paradigms and to the expansion of existing distortions:

i) The case of partial correction (PC):

Partial cost pricing → increasing partial cost inclusion/internalization → higher level cost pricing → partially closing Pareto optimality gap/sustainability gap → increase resource allocation efficiency, but not full resource allocation efficiency, which means there are remaining Pareto optimality/sustainability gaps;

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ii) The case of full correction (FC):

Partial cost pricing → full cost inclusion/internalization → full cost pricing → closing Pareto optimality gap/sustainability gap → full resource allocation efficiency; and

iii) The case of distortion expansion (DE):

Partial cost pricing → increasing cost exclusion/externalization → lower cost pricing → expanding Pareto optimality gap/sustainability gap → full non-dominant component specific resource allocation inefficiency and dominant component specific resource allocation efficiency.

Implication: 7

Flawed paradigm gap expansions come along when the flawed paradigm expands expanding the flawed paradigm price distortions. A partial correction of distorted market prices sends the flawed paradigm closer towards full sustainability making it a positive Pareto optimality dynamics move. A full correction of distorted flawed market prices transforms the flawed paradigms into golden paradigms.

Negative Pareto optimality dynamics and the working of Traditional markets

Since the traditional market model associated with Adam Smith operate under socio-environmental sustainability gaps, the theory of positive and negative Pareto optimality dynamics applies to it as traditional markets are different forms of flawed paradigms since they are socio-environmentally distorted markets. And this means that the working of the traditional market mirrors one to one the direction of the negative Pareto optimality dynamics trend presented above, which expands socio-environmental sustainability gaps, more and more the further away they move from point 1 or the true sustainability point of the golden paradigm (GOP), the point of full sustainability as shown in Figure 8 below:

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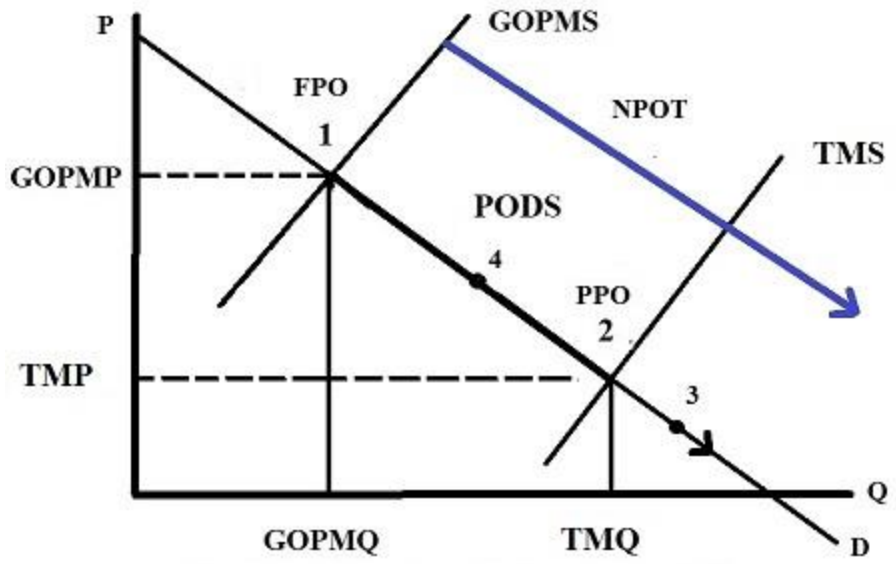

Figure 8 Linking negative Pareto optimality dynamics theory to the working of Traditional markets

At point 2 in Figure 8 above we have a socially and environmentally distorted traditional market paradigm (TMP), producing and consuming the quantity TMQ cleared at the price TMP, which has a socio-environmental sustainability gap (SG) that goes from point 2 to point 1. Notice that the traditional market (TM) at point 2 sits on the decreasing Pareto optimality line that goes from point 1 to the left as indicated by the black arrow, a move in the same direction of the blue negative Pareto optimality dynamics trend arrow moving away from point 1. The existence of these socio-environmental sustainability gaps in the traditional market of Adam Smith (Smith 1776) led the Brundtland Commission in 1987 (WCED 1987) to call for the use of sustainable development means to ensure models internalize social and environmental concerns.

Implication: 8

The traditional market works in the same direction of the negative Pareto optimality trend and it sits on the negative Pareto optimality decreasing sustainability line as it occupies a place away from full or true sustainability at point 1 of the golden paradigm.

Linking critical the socio-environmental sustainability problem-solving issue associated with the working of the traditional market and positive and negative Pareto optimality dynamics theory

The full correction (FC), partial correction (PC) and distortion expansion (DE) and implications associated with the dealing with the critical socio-environmental problem associated with the working of the traditional market of Adam Smith is represented in Figure 9 below:

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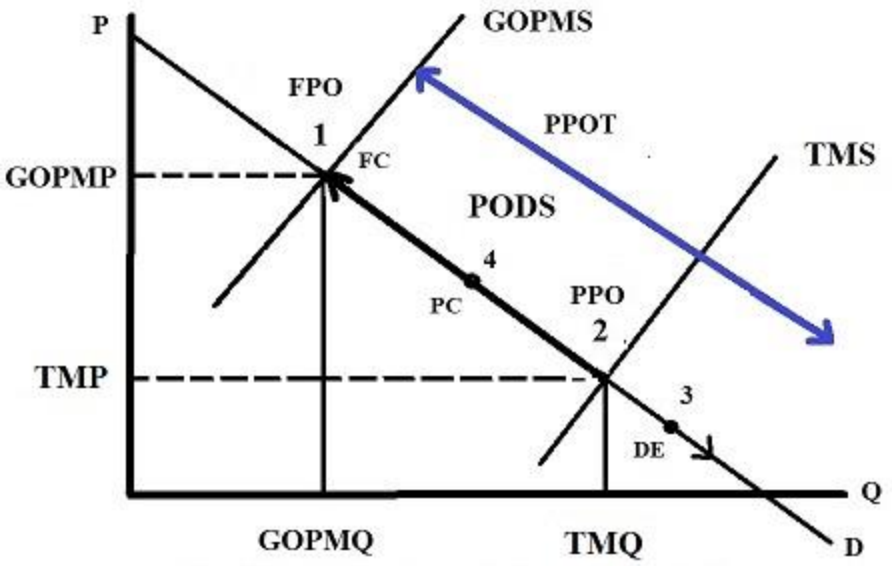

Figure 9 Linking full and partial distortion corrections and distortions expansions with positive and negative Pareto optimality dynamics theory the case of the traditional market

Figure 9 above displays the actions that lead to the partial correction (PC), full correction (FC) or distortion expansion (DE) in the case of addressing the critical socio-environmental problems linked to the working of distorted traditional markets (TM). At point 2 we have a distorted traditional market of Adam Smith, producing and consuming the quantity TMQ cleared at the price TMP, which has a socio-environmental sustainability gap (SG) that goes from point 2 to point 1, Point 1 indicates a point of full correction (FC) where all costs associated with production in traditional markets (TM) are now internalized and the socio-environmental sustainability gap is fully closed (SG = 0). Point 4 shows a point of partial correction (PC) as more socio-environmental costs associated with production in traditional markets than at point 2 are now accounted for leading to a higher traditional market price and lower traditional consumption than at point 2, a point still under remaining socio-environmental sustainability gaps (SG > 0) equal to the distance from point 4 to point 1. Both the partial correction (PC) and the full correction (FC) of the traditional market are positive Pareto optimality moves as they follow the direction of positive Pareto optimality dynamic trends (PODT). Point 3 in Figure 8 above on the other hand is a point of socio-environmental distortion expansion (DE) as point 3 is a point lower socio-environmental Pareto optimality than point 2, a point that expands the existing socio-environmental Pareto optimality gap (POG) at point 2 since POG3 > POG2.

In summary, Figure 9 above helps us to identify the following chain implications with respect to the correction of socio-environmental problems linked to traditional market and with respect to the expansion of those socio-environmental distortions:

i) The case of partial correction (PC) of the traditional market

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Partial cost pricing → increasing socio-environmental cost inclusion/internalization → higher level traditional market cost pricing → partially closing socio-environmental Pareto optimality gap/sustainability gap → increase socio-environmental resource allocation efficiency, but not full resource allocation efficiency, which means there are remaining socio-environmental Pareto optimality/sustainability gaps;

ii) The case of full correction (FC) of traditional markets:

Partial cost pricing → full socio-environmental cost inclusion/internalization → full cost traditional market pricing → closing socio-environmental Pareto optimality gap/sustainability gap → full socio-environmental resource allocation efficiency; and

iii) The case of distortion expansion (DE) in traditional markets

Partial cost pricing → increasing socio-environmental cost exclusion/externalization → lower traditional market cost pricing → expanding socio-environmental Pareto optimality gap/sustainability gap → full socio-environmental resource allocation inefficiency and economic resource allocation efficiency.

Implication: 9

Under distorted traditional market prices, partial corrections are positive Pareto optimality moves that reduce the size of the socio-environmental sustainability gap, but as the remaining sustainability gaps lead to the accumulation of negative pressures it will push the traditional market towards unsustainability in the long term. Traditional market expansions under socio-environmentally distorted markets prices will increase the size of the socio-environmental sustainability gap, and when the accumulation of their negative pressures become binding will lead to traditional market collapse or shift or merger. When distorted traditional market prices are fully corrected it will shift to true sustainability.

Linking the move to the circular traditional economy and negative Pareto optimality dynamics

As the circular market is simply an economic resource use efficient traditional market as the distorted pricing mechanism structure remains the same, then it is a flawed paradigm too that that follows the negative pareto optimality dynamics direction, moving away from the golden paradigm point at point 1as it increasing economic resource use efficiency increases the socio-environmental sustainability gap (SG > 0 since CTMPOG3 > TMPOG2)), a situation summarized in Figure 10 below:

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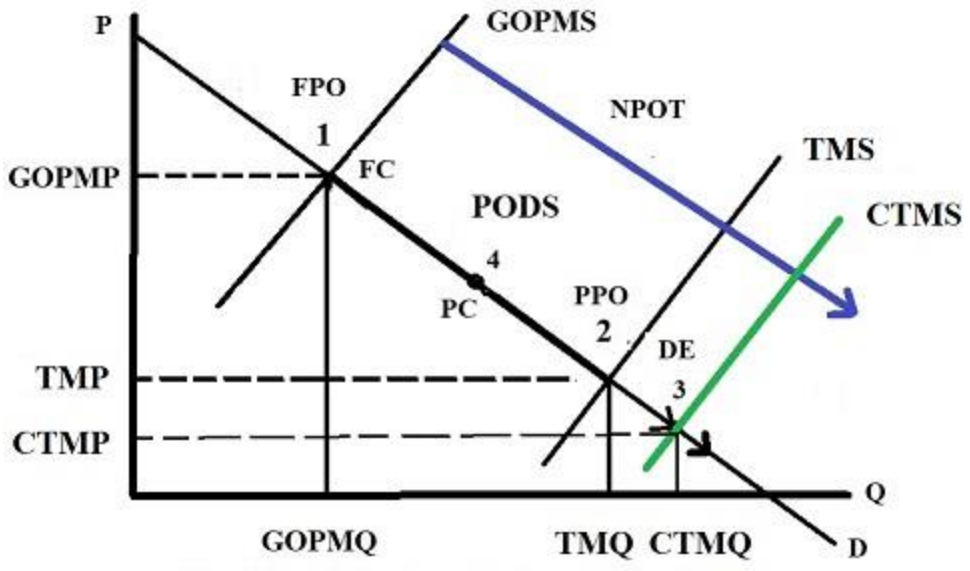

Figure 10 The nature of negative Pareto optimality dynamics and the working of circular traditional markets

At point 3 in Figure 10 above we have a distorted circular traditional market paradigm (CTM), producing and consuming the quantity CTMQ cleared at the price CTMP, which has a socio-environmental sustainability gap (SG) that goes from point 3 to point 1. Point 3, the circular traditional market point, is a point of lower socio-environmental Pareto optimality than the traditional market Pareto optimality point at point 2, which means that increasing resource use efficiency increases the socio-environmental sustainability gap by the distance from point 2 to point 3. And this means that increasing resource use efficiency increases socio-environmental unsustainability as the socio-environmental resources whose costs are not accounted for in the pricing mechanism are now even under more use inefficiency pressures. As shown in Figure 10 above a move to the circular traditional markets (CTM) inspired by the European Union (OECD 2025; WB 2022) expand the socio-environmental distortions existing in the linear market, which means that increased economic resource allocation efficiency in circular traditional markets leads the market away from true sustainability as socio-environmental resource use inefficiency continue to increase as economic resource use allocation efficiency increases.

In summary, Figure 10 above allows us to express the case of distortion expansion (DE) in the case of circular traditional markets in chain form from two different angles:

a) In terms of increasing economic resource use efficiency

Partial cost pricing → increasing socio-environmental cost exclusion/externalization under economic resource use efficiency→ lower circular traditional market cost pricing → expanding socio-environmental Pareto optimality gap/sustainability gap under economic resource use efficiency→ full socio-environmental resource allocation inefficiency and full economic resource allocation efficiency.

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b) In terms of the move from the traditional market point 2 (linear market) to the traditional market at point 3 (circular market):

Point 2/point of higher partial Pareto optimality → point 3 / point of lower partial Pareto optimality since PPO2 > PPO3 → expanded socio-environmental resource allocation inefficiencies under full economic resource allocation efficiency.

c) The discussion above implies that economic resource-use efficiency under an unchanged distorted pricing structure in circular traditional markets can coexist with the problem of socio-environmental unsustainability while intensifying it.

Implication: 10

Under distorted circular traditional market prices, increase resource use efficiency leads to increase socio-environmental unsustainability pressures, which when their accumulation becomes binding will lead to full circular market unsustainability.

Conclusions

It was shown that the golden paradigm-flawed paradigm framework under sustainability gaps and under Pareto optimality gaps can be used to understand the nature of flawed paradigms, in general or as traditional markets or circular traditional markets, how they work, how their issues can be corrected and how their issues can be in reality be made worse. It was stressed that positive Pareto optimality trend means a move towards full or true sustainability while a negative Pareto optimality trend means the opposite. It was pointed out that flawed paradigms in general or traditional market paradigms in particular can be corrected fully or partially to bring them towards true sustainability as well as it was stressed that an expansion of flawed paradigms or traditional markets leads to an expansion of the issues they produce as they work under partial Pareto optimality, and hence, expansions means distortion expansions. It was highlighted than a move from traditional markets to circular traditional markets improves economic resource use but expands the socio-environmental distortions associated with the linear traditional market so economic resource use efficiency means an increase in overall socio-environmental unsustainability.

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