Social sustainability thinking 101: Why is Pareto efficient in traditional markets outside red Pareto efficiency in red markets? What is the structure of red Pareto optimality? What are the implications of this?

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Abstract

At the heart of perfect market thinking is Pareto efficiency thinking, in consumption and in production, where Pareto efficiency in production and consumption is found at the market equilibrium point. In 1987 the Brundtland Commission challenged us to go beyond business as usual by internalizing social issues or environmental issues or socio-environmental issues affecting negatively the working of traditional market thinking as it was leading to the critical social and/or environmental problems they documented. However, instead of going full externality cost internalization as required by sustainability market thinking, the Brundtland Commission went the way of partial cost internalization a la sustainable development thinking, leaving us still under a world of distorted sustainable development markets, be it socially friendly sustainable development markets or environmentally friendly sustainable development markets or socio-environmentally friendly sustainable development markets. Had the Brundtland Commission gone the way of full cost internalization, they could have opened the possibility to a world under red markets if solving the social sustainability issue was the priority or to a world under green markets if solving the environmental sustainability issue was the priority or to a world under true sustainability markets if addressing the socio-environmental sustainability problem was the priority. Hence, the Brundtland Commission could have opened the door to ideas such red Pareto optimality, green Pareto optimality, and sustainability based Pareto optimality, all of which leave behind traditional Pareto optimality thinking. This papers is about red market based Pareto optimality and how this thinking works and transforms the economic component specific based Pareto optimality concept into a conjunctural sub-system specific concept that would have applied if the Brundtland Commission would have make the priority to fully address the social sustainability problem in 1987. A shift to red market thinking means that traditional pareto efficiency thinking is left behind as when internalizing social costs in the pricing mechanism of the traditional market we shift the production frontier, the social indifference curve, and the market price line of the traditional market towards the red market based production frontier, the red market based social indifference curve, and the market price line of red markets, and therefore, it is a shift towards red market based pareto optimality, giving birth that way to the idea of red market based Pareto efficiency thinking. This is because at the heart of red market thinking is the concept of red market based pareto efficiency, in red market

based consumption and in red market based production, where red market based pareto efficiency in production and consumption is found at the red market equilibrium point. In other words, a shift from traditional perfect market thinking to perfect red market thinking indicates a shift from traditional Pareto efficiency and optimality to red market based Pareto efficiency and optimality, yet to my knowledge nothing is written about this. And this raises questions such as why is Pareto efficient in traditional markets outside red Pareto efficiency in red markets? What is the structure of red Pareto optimality? What are the implications of this?

Key words

Pareto efficient, Pareto inefficient, Pareto improvement, Pareto optimal, red Pareto efficient, red Pareto inefficient, red Pareto improvement, red Pareto optimal, paradigm shift, traditional market, red market

Introduction

a) The nature of pareto efficiency thinking

The nature of pareto efficiency thinking can be extracted with the use of three components, the production frontier(PF), the social indifference curve(SIC), and the market price line(MPL) in relation to production and consumption bundles of product Q and product R , as indicated in Figure 1 below:

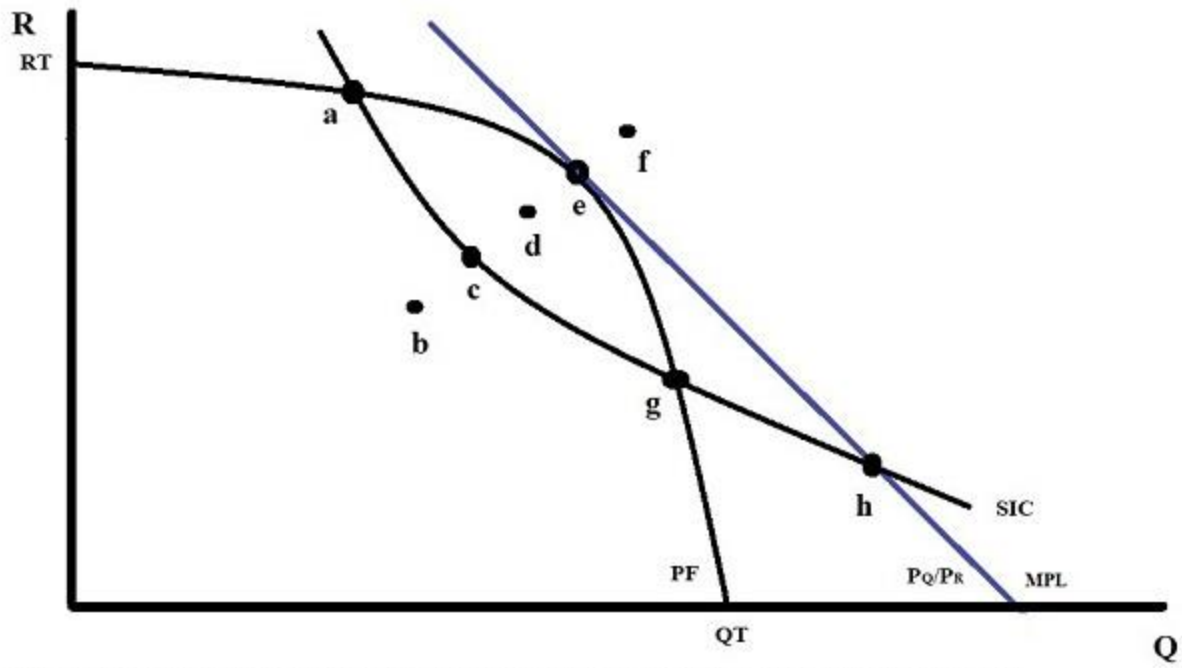

Figure 1 The thinking behind pareto efficient, pareto inneficient, pareto improvement and pareto optimal

Figure 1 above shows a constellations of points that are used below to point out the thinking behind pareto efficient, pareto inefficient, pareto improvement, and pareto optimal as they relate to the production frontier(PF), the social indifference curve(SIC) and the market price line(MPL), as described in detail below:

1) The thinking behind the production frontier(PF)

We can see in Figure 1 above that there is a production frontier PF, where all production bundles on it like points "a", "e", and "g" are pareto efficient in production because at those points no pareto improvements in production exist. Points "b", "c" and "d" are pareto inefficient in production as pareto improvements in production exist. Points "f" and "h" are production points that falls outside the production frontier so producing at that level is not possible. Producing at point "d' for example is preferred than producing at point "b". Notice that here the idea of more production is better prevails in the analysis.

2) The thinking behind the social indifference curve(SIC)

We can see in Figure 1 in above that there is a social indifference curve SIC, where all consumption bundles on it like points "a", "c", "g" are pareto inefficient in consumption because at those points pareto improvements in consumption exist, and notice that point "h" is a consumption point on the social indifference curve (SIC) that falls outside the production frontier (PF); and therefore, that consumption bundle is not available. Point "b' is the pareto inefficient consumption bundle less preferred and point "f" is the consumption bundle more preferred as it

is on a higher indifference curve, but it is not available. Notice that here the idea of more consumption is better prevails in the analysis.

3) The thinking behind the market price line(MPL)

We can see in Figure 1 above that there is a market price line(MPL), with points like point "e" and "h", where at point "e" there is pareto efficient production and pricing that is optimal as the market line is tangent to the pareto efficient point "e"; and at point "h" there is pricing of a consumption bundle on the indifference curve that falls outside the production frontier, and therefore, it is not available. Notice that here the idea that the market price line when tangent determines optimal production and consumption levels prevail in the analysis.

b) The transition towards pareto optimality

As long as there are pareto improvement moves in consumption such as the ones indicated in Figure 1 above we should expect the social indifferent curve(SIC) to move up towards no pareto improvements in consumption since more consumption is better until it reaches its optimal consumption point at point "e" as indicated in Figure 2 below:

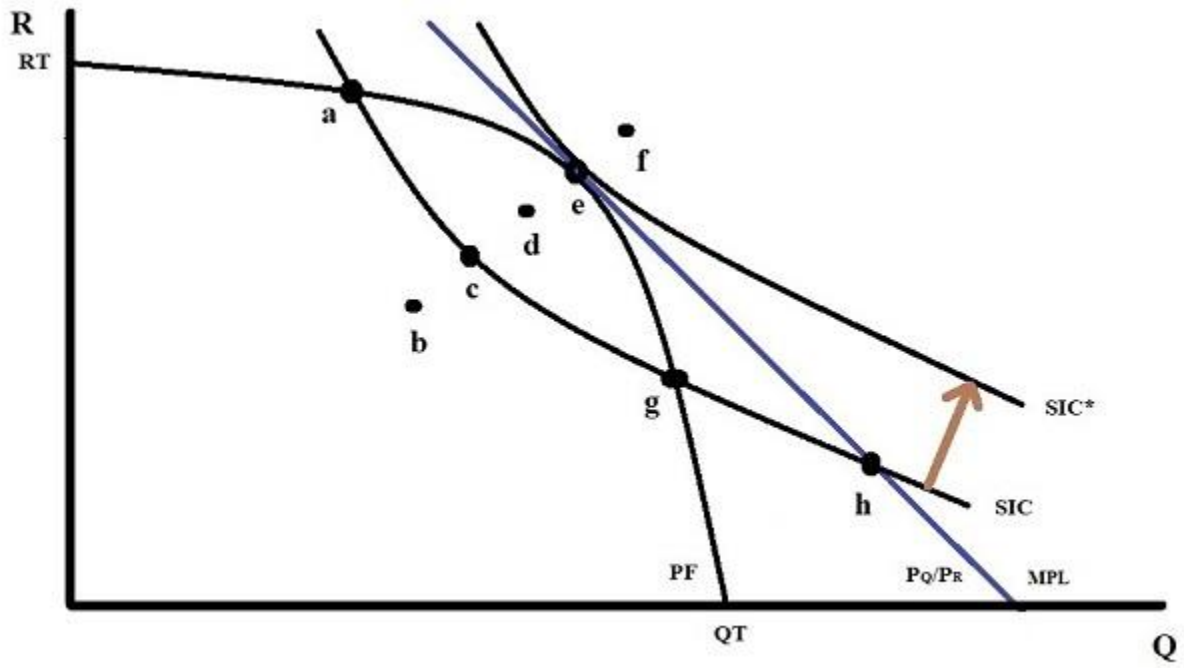

Figure 2 The move from non-optimal social indifference curves(SIC) to the optimal social indifference curve(SIC*)

We can see in Figure 2 above that since consuming more is better the social indifference curve (SIC) will shift up from point "c" all the way to point "e" as there we have the optimal level of consumption and the maximum that can be consumed; and therefore, at that point "e" the social indifference curve (SIC) takes the form of an optimal social indifference curve (SIC*), where optimal pareto efficiency in consumption exists. In other words, pareto improvements in consumption can be made from point "c" and up, and these possible pareto improvements will

stop when the social indifference curve(SIC) reaches point “e”, the optimal point in production and consumption and pareto efficient. Notice that consumption at point “f” is preferred to point “e”, but it is not available, so the best and optimal consumption point is point “e”. Therefore, at point “e” we have optimal production, optimal consumption and optimal pricing, and therefore, point “e” is both pareto efficient and pareto optimal.

c) The structure of pareto optimality

Consistent with the above discussion, at the heart of perfect market thinking is Pareto efficiency thinking, in consumption and in production, where Pareto efficiency in production and consumption is found at the market equilibrium point, a situation pointed out in Figure 3 below:

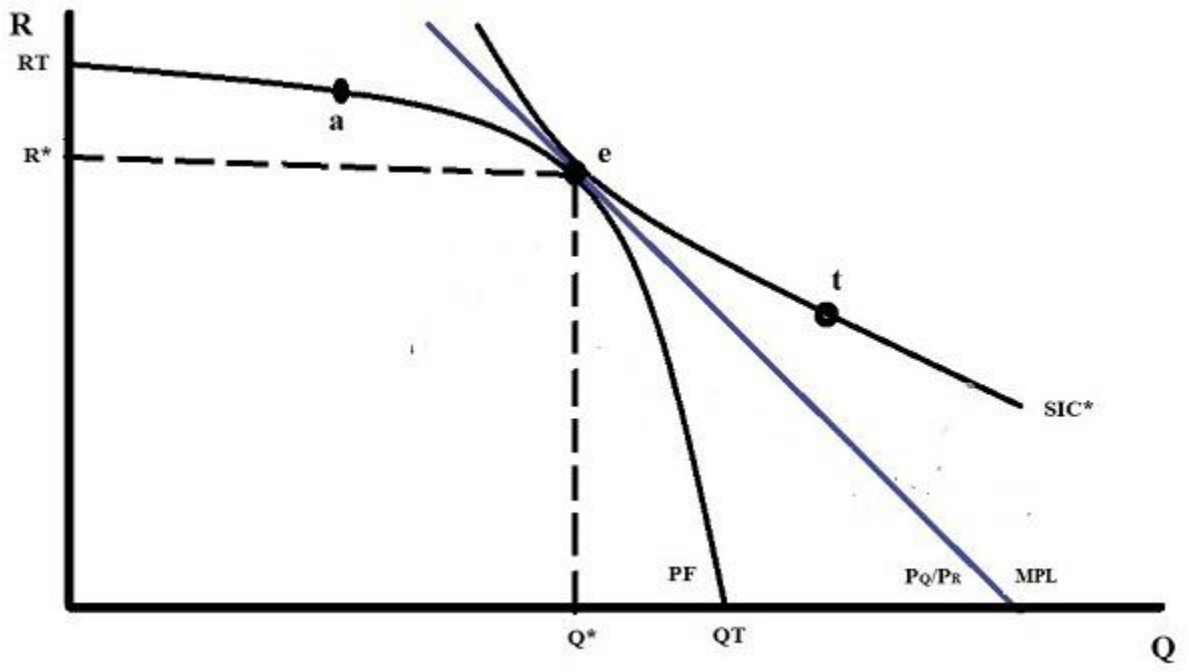

Figure 3 The structure of traditional pareto optimality

We can see in Figure 3 above that point “e” is the optimal point, 1) the point where we have optimal pareto efficiency in production and optimal pareto efficiency in consumption at the same time; and 2) the point where the traditional market price line determines the optimal quantities to be produced and consumed so it is a point of optimal pricing. We can see also in Figure 3 above also the following 1) that any point on the production frontier(PF) that is not “e” such as point “a” is pareto efficient in production, but it is not optimal; 2) that any point of the social indifference curve(SIC*) that is not “e” such as point “t” is pareto efficient in consumption, but it is not optimal; and therefore, 3) only point “e” is pareto efficient and optimal at the same time, in production and in consumption and in pricing.

Notice that since at point "e" the slopes of the production frontier(PF), of the social indifference curve(SIC) and of the traditional market price line(TML) are the same, then the following is true:

1) $\left|\text{Slope of PF}\right| = \left|\text{Slop of SIC}\right| = \left|\text{Slop of TML}\right|$

2) $MC_Q/MC_R = MU_Q/MU_R = P_Q/P_R$

3) $MC_Q = MU_Q = P_Q$

4) $MC_R = MU_R = P_R$

And therefore, point "e' meets all the pareto optimality conditions in production, in consumption and in pricing at the same time, which is the reason why it summarizes the structure of pareto optimality. Notice that pareto optimality is possible only because of the externality neutrality assumption, which allow for the externalization of costs associated with production like social costs and environmental costs.

d) The nature of red Pareto efficiency thinking

In 1987 the Brundtland Commission (WCED 1987) challenged us to go beyond business as usual by internalizing social issues or environmental issues or socio-environmental issues affecting negatively the working of traditional market thinking as it was leading to the critical social and/or environmental problems they documented. However, instead of going full externality cost internalization as required by sustainability market thinking, the Brundtland Commission went the way of partial cost internalization a la sustainable development thinking without any specific social and/or environmental problem solving priority (Muñoz 2024), leaving us still under a world of distorted sustainable development markets, be it socially friendly sustainable development markets or environmentally friendly sustainable development markets or socio-environmentally friendly sustainable development markets. Had the Brundtland Commission gone the way of full cost internalization, they could have opened the possibility to a world under red markets if solving the social sustainability issue was the priority or to a world under green markets if solving the environmental sustainability issue was the priority or to a world under true sustainability markets if addressing the socio-environmental sustainability problem was the priority. Hence, the Brundtland Commission could have opened the door to ideas such red Pareto optimality, green Pareto optimality, and sustainability based Pareto optimality, all of which leave behind traditional Pareto optimality thinking. The ideas of green Pareto optimality (Muñoz 2020) and of sustainability based Pareto optimality (Muñoz 2026) has been recently shared. This papers is about red Pareto optimality and how this thinking works and transforms the economic component specific based Pareto optimality concept into a conjunctural subsystem specific concept that would have applied if the Brundtland Commission would have make the priority to fully address the social sustainability problem in 1987. A shift to red market thinking means that traditional Pareto efficiency thinking is left behind as when

internalizing social costs in the pricing mechanism of the traditional market we shift the production frontier, the social indifference curve, and the market price line of the traditional market towards the red market production frontier, the red market social indifference curve, and the market price line of red markets, and therefore, it is a shift towards red market based pareto optimality, giving birth that way to the idea of red market based Pareto efficiency thinking. This is because at the heart of red market thinking is the concept of red market based Pareto efficiency, in red consumption and in red production, where red market based Pareto efficiency in production and consumption is found at the red market equilibrium point. In other words, a shift from traditional perfect market thinking to perfect red market thinking indicates a shift from traditional Pareto efficiency and optimality to red market based Pareto efficiency and optimality, yet to my knowledge nothing is written about this. The idea that paradigm shifts have unintended consequences such as leaving the knowledge base and anything supported on that old knowledge base behind (Muñoz 2016a) as well as how the perfect red market structure looks like (Muñoz 2016b) and how it is expected to work under perfect red market competition (Muñoz 2019) has been recently shared. And this raises questions such as why is Pareto efficient in traditional markets outside red Pareto efficiency in red markets? What is the structure of red Pareto optimality? What are the implications of this?

Goals of this paper

a) To point out that internalizing social costs in the traditional market shifts the pareto optimal point to the red pareto optimal point; b) To stress that in the new market even the pareto efficient point is not desirable to red stakeholders as all production and consumption points of the traditional market fall outside the red pareto production and red consumption functions so they are not available in red markets; and c) To state the structure of red pareto optimality both analytically and graphically.

Methodology

1) The terminology used to support the ideas in this paper are shared; 2) The process behind the shift from pareto efficiency to red market based pareto efficiency when social costs are internalized is indicated; 3) The nature of red market based pareto efficiency thinking is pointed out in detail; 4) The pareto efficiency world is compared to the red pareto efficiency world to stress that all consumption points and production points in the traditional market and traditional pareto optimality thinking including the pareto optimal point fall outside the red market based production frontier; and therefore, they are not possible choices in red markets; 5) The migration of red market based social indifference curves towards red optimality is described as driven by moves from red pareto inefficient points to red pareto efficient point; 6) The

structure of red pareto optimality is highlighted graphically and analytically; and 7) Some food for thoughts and relevant conclusions are provided.

Terminology

RT = Total production of product R R* = Optimal production and consumption of product R

QT = Total production of product Q R = Product R

Q* = Optimal production and consumption of product Q Q = Product Q

RMR = Red market product R

RMRT = Total production of red market based product R

RMQ = Red market based product Q

RMQT = Total production of red market based product Q

MPL = Traditional market price line RMPL = Red market price line

SIC = Social indifference curve

RMSIC = Red market based social indifference curve

SIC* = Optimal social indifference curve PF = Production frontier

RMSIC* = Optimal red market based social indifference curve

RMPF = Red market based production frontier

e = Pareto optimal point i = Red market based Pareto optimal point

RMR* = Optimal red market based production of product R

RMQ* = Optimal red market based production of product Q

RMP = Red market price RMU = Red market marginal utility

RMMC = Red market marginal cost U = Marginal utility

MC = Marginal cost P = TMP = MP = Traditional market price

RMU = Red market marginal utility

RMP_Q = Red market marginal price for commodity Q

RMP_R = Red market marginal price for commodity R

P_Q = Marginal price for commodity Q P_R = Marginal price for commodity R

Operational concepts

1) Traditional market, *the economy only market*

2) Red market, *the social friendly market*

3) Traditional market price, the *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).*

4) Red market price, *the price that reflects the social cost of production or the price that covers the cost of socially friendly production.*

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

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

7) Cost externalization neutrality assumption, *the assumption that production has minimal or no cost impact on external factors to a market model.*

8) Full costing, *the reflecting in the pricing mechanism of the market all cost associated with production; there are no market distortions.*

9) Partial costing, *not reflecting in the pricing mechanism of the market all cost associated with production; there are partial market distortions.*

10) No costing, *not reflecting in the pricing mechanism of the market any costs associated with production; there is full market distortion.*

11) 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.*

12) 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.

13) Full cost externalization, *all costs associated with production are not reflected in the pricing mechanism of the market.*

14) Partial cost externalization, *some costs associated with production are not reflected in the pricing mechanism of the market.*

15) No cost externalization, *all costs associated with production are reflected in the pricing mechanism of the market.*

16) Full cost internalization, *all costs associated with production are reflected in the pricing mechanism of the market.*

17) Partial cost internalization, *some costs associated with production are reflected in the pricing mechanism of the market.*

18) No cost internalization, *all costs associated with production are not reflected in the pricing mechanism of the market.*

19) Externalities, *factors assumed exogenous to a model*

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

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

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

23) Economic externality, *the economic costs associated with production not reflected in the pricing mechanism of the market.*

24) Social externality, *the social cost associated with production not reflected in the pricing mechanism of the market.*

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

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

27) Profit, *the incentive to encourage economic activity*

28) Full cost price, *a price that reflects all costs associated with production.*

29) Some cost price, *a price that reflects only some costs associated with production.*

30) No cost price, *a price that does not reflect any cost associated with production.*

31) Circular market illusion, *the idea that production activity can take place without producing relevant externalities.*

32) Circular traditional economy illusion, *the idea that production activity can take place without producing relevant social and/or environmental externalities.*

33) Circular dwarf red market economy, *the idea that market prices can be manipulated externally to generate revenue to cover the cost of dealing with the externality they create to close the non-free market cycle production-consumption-social externality.*

34) Circular red market economy, *the idea that market prices reflect the cost of making business socially friendly in order to cover the cost of dealing with the social externalities they create to close the free market cycle production-consumption-social externality.*

35) Circular social externality management based market illusion, *the idea that you can solve a social externality problem by dealing with the consequences of that problem, not the cause.*

36) Pareto optimal, *the levels of production and consumption determined by the traditional market price.*

37) Red market based Pareto optimal, *the levels of red market based production and red market based consumption determined by the red market price.*

The shift from Pareto efficiency to red market based Pareto efficiency

When the social cost of doing business is internalized in the pricing mechanism of the traditional market the whole Pareto optimal structure in Figure 3 above shifts towards the red market based Pareto optimal structure as indicated in Figure 4 below:

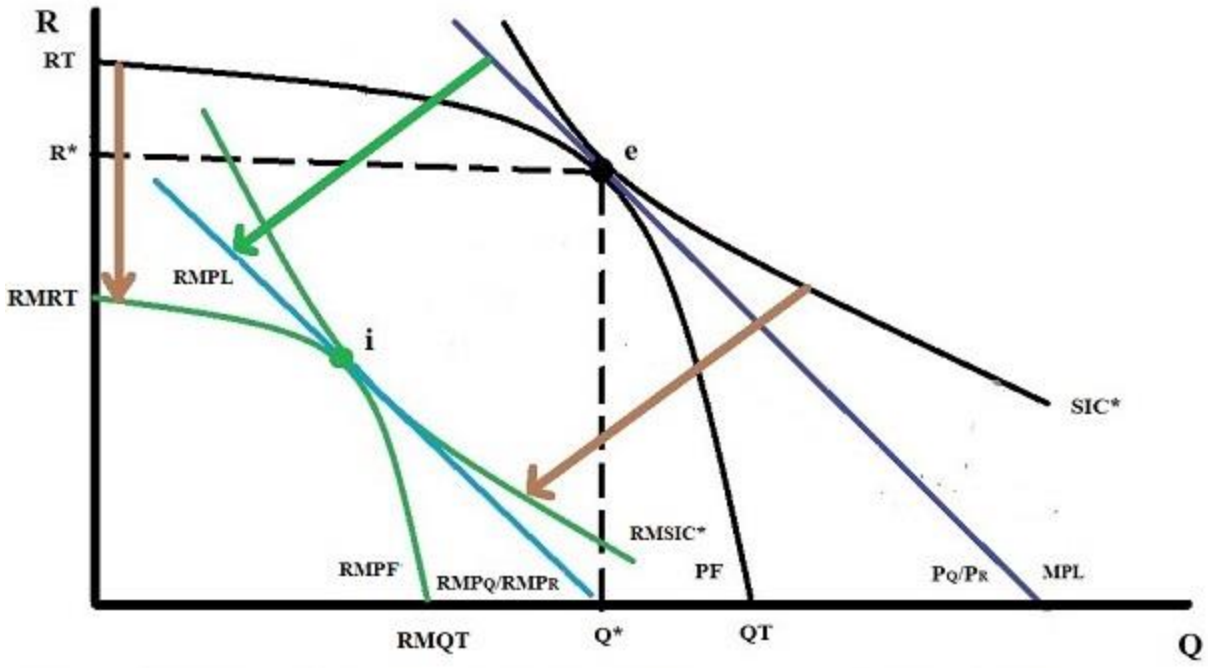

Figure 4 The shift from traditional Pareto optimality point "e" to red pareto optimality at point "i"

Figure 4 helps see the following consequences of social cost internalization in the traditional market producing commodities Q and R: 1) The traditional production frontiers(PF) shifts and takes the form of the true sustainability based production frontier(TSPF) as indicated by arrow going from RT to RMRT; 2) the traditional optimal social indifference curve(SIC*) shifts and takes the form of the red market based optimal social indifference curve(RMSIC*) as indicated by the arrow going from SIC* to RMSIC*; and 3) The traditional market price line(MPL) shifts and takes the form of the red market price line(RMPL) as shown by arrow going from MPL to RMPL. Hence, Figure 4 above helps us appreciate that the internalization of social costs shifts the traditional Pareto optimal point at point "e' to the red market based pareto optimal point at point "i".

The nature of red market based Pareto efficiency thinking

The nature of red market based pareto efficiency thinking then can be extracted with the use of three components, the red market based production frontier (RMPF), the red market based social indifference curve (RMSIC), and the red market based market price line (RMPL) in relation to red market based production and red market based consumption bundles of product Q and product R, as indicated in Figure 5 below:

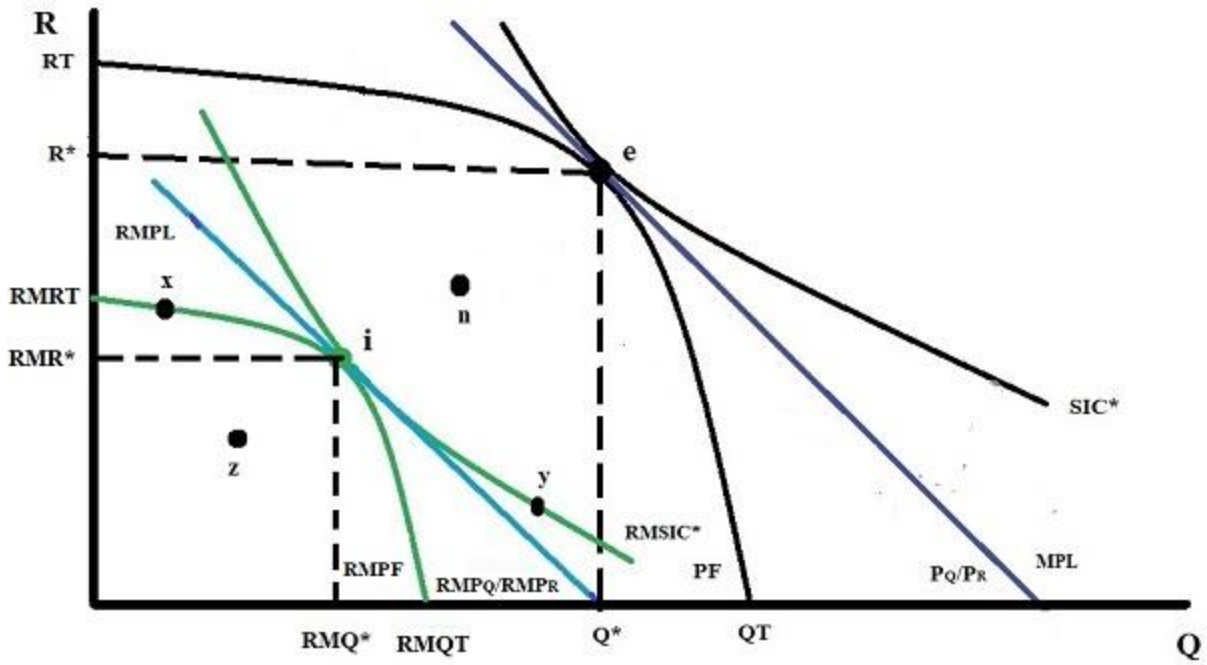

Figure 5 Contrasting the red Pareto optimality at point "i" with traditional Pareto optimality at point "e"

Figure 5 above shows a constellations of points that are used below to highlight the thinking behind red market based pareto efficient, red market based pareto inefficient, red market based pareto improvement, and red market based pareto optimal as they relate to the red market based production frontier (RMPF), the red market based social indifference curve (RMSIC) and the red market price line (RMPL), as described in detail below:

1) The thinking behind the red market based production frontier (RMPF)

We can see in Figure 5 above that there is a red market based production frontier RMPF, where all production bundles on it like points "x" and "i" are red market based Pareto efficient in production because at those points no red market based Pareto improvements in red market based production exist. Points "z" is red market based Pareto inefficient in production as red market based Pareto improvements in red market based production exist. Point "n" is a production point that is preferred to "z" but falls outside the red market based production frontier so producing at that level is not possible. Notice that here the idea of more red market based production is better prevails in the analysis.

2) The thinking behind the red market based social indifference curve (RMSIC)

We can see in Figure 5 in above that there is a social indifference curve RMSIC, where all consumption bundles on it like points "y" and "i" are red market based pareto efficient in consumption because at those points red market based pareto improvements in consumption do not exist, but notice that since point "y" falls outside the red market based production frontier

(RMPF) that red market based consumption bundle is not available. Point "z' is the red market based Pareto inefficient consumption bundle less preferred and point "n" is the red market based consumption bundle more preferred, but it is not available. Notice that here the idea of more red market based consumption is better prevails in the analysis.

3) The thinking behind the red market based market price line (RMPL)

We can see in Figure 5 above that there is a red market based market price line (RMPL) going through point "i" tangent to the red market based production frontier (RMPF) and to the red market based social indifference curve (RMSIC*) at the same time; and this means that at point "i" there is red market based Pareto efficiency in production, red market based Pareto efficiency in consumption and red market pricing that is optimal. See that point "x" is red market based Pareto efficient in production, but it is not optimal and point "i" is red market based Pareto efficient in production and it is optimal. Point "y" on the other hand, if it existed, it would be red market based Pareto efficient in red market based consumption, but it is not optimal while point "i" is red market based Pareto efficient in consumption and it is optimal. Notice that here the idea that the red market based market price line (RMPL) when tangent determines optimal red market based production and red market based consumption levels prevail in the analysis.

Comparing the world of Pareto efficiency with that of red market based Pareto efficiency

When comparing the structure of pareto optimality at point "e" with red market based pareto optimality at point "i" in Figure 5 above we can see the following: 1) Traditional optimal pareto production and consumption is higher than optimal red market based pareto production and consumption(Q* > RMQ*; R* > RMR*); 2) if we were living in a red market based world and we suddenly externalize all social costs, then red markets would become traditional markets operating at point "e"; and 3) if we are living in a world of perfect traditional markets and we suddenly internalize all social costs, then traditional markets would become true red markets operating at point "i". By comparing point "e" and point "i" in Figure 5 above we can state that 1) pareto optimality is not red market based pareto optimality; and therefore, 2) even pareto efficient and optimal points like point "e" would not be available under true red markets as they fall outside the red market production frontier. In other words, we can see clearly in Figure 5 above that pareto efficient in traditional markets falls outside red market based pareto efficiency in red markets as even the pareto optimal point falls outside the red market based production frontier (RMPF) so traditional market choices would not be available in red markets.

The migration of red market based social indifference curves towards red market based optimality

As long as there are red market based pareto improvement moves in red market based consumption possible such as point "z" in Figure 5 above we should expect the red market based social indifferent curve (RMSIC) to move up towards no red market based pareto improvements in red market based consumption since more red market based consumption is better until it reaches its optimal red market based consumption point at point "i". In other words, we can see in Figure 5 above that since consuming more is better the red market based social indifference curve (RMSIC) will shift up from point "z" all the way to point "i" as there we have the optimal level of red market based consumption and the maximum that can be consumed; and therefore, at that point "i" the red market based social indifference curve (RMSIC) takes the form of an optimal red market based social indifference curve (RMSIC*), where optimal red market based pareto efficiency in red market based consumption exists. Notice that red market based consumption at point "n" is preferred to point "i", but it is not available, so the best and optimal red market based consumption point is point "i". And this means that at point "i" we have optimal red market based production, optimal red market based consumption and optimal red market based pricing at the same time, and therefore, point "i" is both red market based pareto efficient and red market based pareto optimal.

The structure of red market based Pareto optimality

At the heart of perfect red market thinking as pointed out above is red market based pareto efficiency thinking, in red market based consumption and in red market based production, where red market based pareto efficiency in red market based production and red market based consumption is found at the red market equilibrium point, a situation indicated in Figure 6 below:

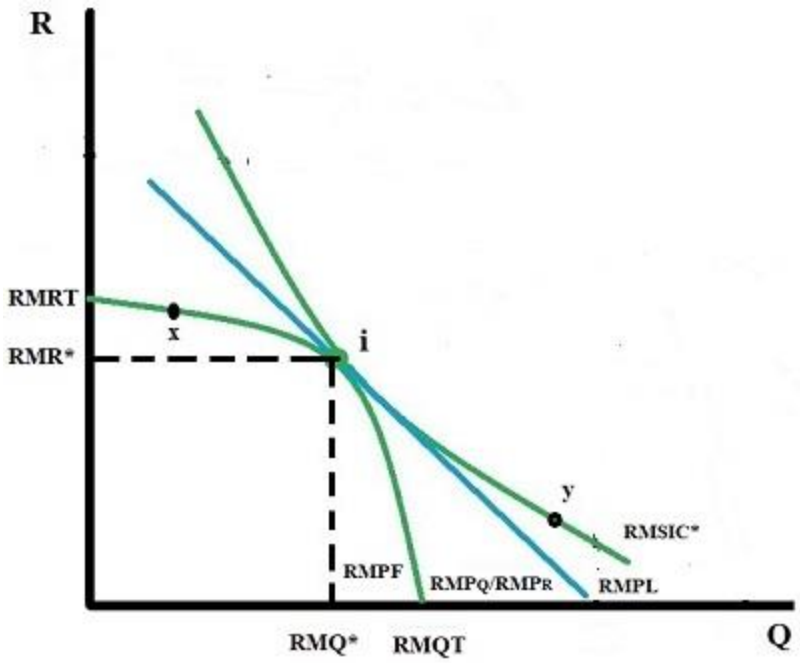

Figure 6 The structure of the red Pareto optimality

We can see in Figure 6 above that point "i" is the optimal red market point, 1) where we have optimal red market based pareto efficiency in production and optimal red market based pareto efficiency in consumption at the same time; and 2) the point where the red market based market price line (RMPL) determines the optimal red market based quantities to be produced and consumed so it is a point of optimal red market pricing. We can see also in Figure 6 above also the following 1) that any point on the red market based production frontier(RMPF) that is not "i" such as point "x" is red market based pareto efficient in production, but it is not optimal; 2) that any point on the red market based social indifference curve(RMSIC*) that is not "i" such as point "y" is red market based pareto efficient in consumption, but it is not optimal and it is not available; and therefore, 3) only point "i" is red market based pareto efficient and optimal at the same time, in red market based production and in red market based consumption and in red market based pricing.

Notice that since at point "i" the slopes of the red market based production frontier (RMPF), of the red market based social indifference curve(RMSIC) and of the red market based market price line(RMPL) are the same, then the following is true:

1) $\left|\text{Slope of RMPF}\right| = \left|\text{Slop of RMSIC}\right| = \left|\text{Slop of RMPL}\right|$

2) $RMMC_Q/RMMC_R = RMMU_Q/RMMU_R = RMP_Q/RMP_R$

3) $RMMC_Q = RMMU_Q = RMP_Q$

4) $RMMC_R = RMMU_R = RMP_R$

And therefore, point "i' meets all the red market based pareto optimality conditions in red market based production, in red market based consumption and in red market based pricing at the same time, which is the reason why it summarizes the structure of red market based pareto optimality. Notice red market based Pareto optimality is possible only because there is no social externality neutrality assumption here in red true sustainability markets as both the economic and social costs of production are reflected in the red market price.

Food for thoughts

1) Do paradigm shifts from traditional markets to red markets means that the knowledge base of the traditional market does not work in the new paradigm? I think yes, what do you think?; 2) Can red market based Pareto optimality be seen as a fix of traditional Pareto optimality to make it socially friendly? I think yes, what do you think?; 3) Can we think of the gap between red market based Pareto optimality and traditional Pareto optimality as a social externality management market zone? I think yes, what do you think?.

Conclusions

1) The internalization of social costs in the pricing mechanism of the traditional market shifts the pareto optimal structure to the red market based pareto optimal structure; 2) The nature of red market based pareto efficiency thinking can be taken as a correction of pareto optimality thinking to make it socially friendly; 3) Once in red markets, traditional pareto efficiency thinking does not work as now all traditional pareto efficiency choices, included the optimal choice falls outside the red market based production frontier and so they are not available in red markets; 4) Red market based social indifference curves migrate just like traditional social indifference curves, but now the driver is the presence of red market based pareto improvements; and 5) The structure of red market based pareto optimality shows that if social concerns are fully internalized, then we leave the world of traditional pareto optimality behind as now we are in the world of true red markets.

References

Muñoz, Lucio, 2016a. **The Unintended Consequences of Paradigm Death and Shift: Was the Arrow Impossibility Theorem Left Behind?,** ***Weber Economics & Finance (ISSN:2449-1662),*** **Vol. 2 (3) 2016, Article ID wef_170, 547-555.**

Muñoz, Lucio, 2016b. Beyond Both Red Socialism Thinking and Traditional Market Thinking: What Is the Structure of the Perfect Red Market?. In: ***International Journal of***

Advanced Engineering and Management Research (IJAEMR), **Vol.1, Issue 5, Pp 546--568, India.**

Muñoz, Lucio, 2019. **From Traditional Markets to Red Markets: A Look at Markets Under Perfect Socially Friendly Market Competition, In:** ***International Journal of Management Studies and Social Science Research(IJMSSSR***), Volume 1, Issue 2, March-April, Ed. Dr.Vishal Muvel, ISSN 2582-0265, India.

Muñoz, Lucio, 2020. **Sustainability thoughts 125: Why is Pareto efficient in traditional markets outside green Pareto efficiency in green markets? What is the structure of green Pareto optimality? What are the implications of this?, In:** ***International Journal of Management studies and Social Science Research(IJMSSSR),*** Vol. 2, Issue 6, November-December, Pp 108-117, ISSN: 2582-0265, India.

Muñoz, Lucio, 2024. **Sustainability thoughts 194: How can we show that the sustainable development solutions to the socio-environmental sustainability problem created by traditional market thinking by 1987 are both partial and without clear priority solutions?,** In: ***International Journal of Education Humanities and Social Science(IJEHSS),*** ISSN: 2582-0745, May-June, Vol. 7, Issue 3, Pp. 6-17, India.

Muñoz, Lucio, 2026. **True sustainability thinking 101: Why is Pareto efficient in traditional markets outside sustainability based Pareto efficiency in sustainability markets? What is the structure of sustainability based Pareto optimality? What are the implications of this?,** ***CEBEM-REDESMA Boletin*****,** Año 20, Nº 4, March, La Paz, Bolivia.

World Commission on Environment and Development (WECD), 1987. ***Our Common Future***. London, Oxford University Press, UK.