Short Elucidating Note 103: How can we expand the idea of traditional Pareto optimality to all forms of perfect markets within a system that has social, environmental and economic components under conjunctural state theory?

By

Lucio Muñoz*

*Independent qualitative comparative researcher / consultant, Vancouver, BC, Canada. Email: munoz@interchange.ubc.ca

Abstract

The idea of traditional Pareto optimality, the state where no one can make gains without someone else losing, sounds general, but it is actually dominant component specific, in this case the dominant economic component based Pareto optimality. So if the dominant component changes the definition of Pareto optimality that applies to this new paradigm changes, but this is not well-known right now to my knowledge as attention has always been focused on the pareto idea that applies to the economy first model, but paradigm evolution thinking requires the evolution of ideas outside the dominant component paradigm at the same level of analysis or at a higher level of analysis. The goal of this short note is to introduce a market variability model which can be used, using qualitative comparative means, to create the knowledge that allows us to state the Pareto optimality definition of all possible perfect markets in component specific terms, including that of the traditional perfect markets a la Adam Smith step by step.

Relevant concepts

Traditional economic based Pareto optimality, traditional specific component based Pareto optimality, deep environmentalism based Pareto optimality, deep socialism based Pareto optimality, red Pareto optimality, green Pareto optimality, yellow Pareto optimality, and true sustainability based Pareto optimality.

Introduction

Below the key aspects relevant to understanding traditional Pareto optimality thinking are addressed in very simple terms using qualitative comparative thinking and tools.

a) The market model a la Adam Smith

The traditional market's Pareto optimality structure in terms of the economy as the only dominant component in the system can be stated as follows:

1) TMPO = B

Expression 1) above tells us that traditional market pareto optimality is only about economic factors (B) as social and environmental externalities cannot happen here due to the socio-environmental externality neutrality assumption so they are dropped out of the traditional market, a market where only economic costs are accounted for, where the choice is an independent economic choice, and where the market is cleared out by the traditional market price (TMP), at a profit (TMP = ECM + i) or zero profit (TMP = ECM).

b) The model of Adam Smith in reality

In reality, traditional markets have social (a) and environmental (c) impacts and because they are assumed away we have seen the coming of critical social and environmental problems (ac) right in front of our eyes, so the actual structure of the traditional market is:

2) TMPO = aBc

Expression 2) above tells us that traditional market pareto optimality is only about economic factors (B), but it has socio-environmental sustainability gaps (ac), which are there but they are assumed not to be there, a market where only economic costs (ECM) are accounted for, where the choice is an independent economic choice (IC), and where the market is cleared out by the traditional market price (TMP).

c) The conjunctural state of Adam Smith's model

As in traditional Pareto optimality thinking only the economy is dominant (B = 1 = Present), only economic costs are reflected in the pricing mechanism of the market (ECM = 1 = Present), and only independent economic costs exists (IC = 1 = Present), then its conjunctural state structure can be as follows

3) TMPO = aBc = (0,1,0)

Expression 3) above in conjunctural terms tells us that in traditional market Pareto optimality thinking social (a) and environmental (c) components do not matter (a = c = 0 = absent), social costs (SM) and environmental costs (EM) do not matter (SM = EM = 0 = absent), and only economic costs matter (ECM = 1 = Present). Here, the traditional market price at profit (TMP = ECM + i) or zero profits (TMP = ECM) clears the market, a free market under independent economic choice/preferences (IC) since IC = 1 = present.

d) The definition of Pareto optimality we all know

Hence, the definition of traditional pareto optimality that we know is the state where no one can be better off without making others worse off, and this happens at the conjunctural state where only economic factors are reflected in the pareto optimality point, which is TMPO = (0,1,0).

e) The need to expand Pareto optimality thinking outside economics and beyond economic thinking

Hence, the idea of traditional Pareto optimality, the state where no one can make gains without someone else losing, sounds general, but as indicated above it is actually dominant component specific, in this case the dominant economic component based Pareto optimality. So if the dominant component changes the definition of Pareto optimality that applies to this new paradigm changes, but this is not well-known right now to my knowledge as attention has always been focused on the pareto optimality idea that applies to the economy first model, but paradigm evolution thinking requires the evolution of ideas outside the dominant component paradigm at the same level of analysis or outside at a higher level of analysis. The goal of this short note is to introduce a market variability model which can be used, using qualitative comparative means, to create the knowledge base that allows us to state the Pareto optimality definition of all possible perfect markets in component specific terms, including that of the traditional perfect markets a la Adam Smith step by step.

The market variability model

If we assumed a system (M) where there are 3 components, component A, component B, and component C, where capital letters means the components are present in dominant or active form and lower case letters means that the component is in dominated or passive form, then the variability of that system can be stated as indicated below:

4) $M_i = A + B + C$

Expression 4) above is highlighting that there is a different type of model M_i that comes out when one or two or all components in the system are in active form, each one with its unique dominant structure, cost structure and preference structure, and degree of responsibility.

The structure of all markets in order of increasing responsibility

Table A below contains the 8 possible models consistent with expression 4) above, from the lowest level of responsibility (M1) to the higher level of responsibility (M8):

TABLE A

M1 = abc = the fully unsustainable market

M2 = Abc = the deep socialism market

M3 = aBc = The deep economy market

M4 = abC = The deep environmental market

M5 = ABc = The red market

M6 = aBC = The green market

M7 = AbC = The socio-environmental market

M8 = ABC = Yellow sustainability market

The conjunctural state structure of each market

We can state the conjunctural structure of all 8 paradigms above by creating a conjunctural truth table where a capital letter means that component is present in dominant or active form (e.g. A = 1 = present in dominant form; and where a lower case letters means that the component is absent in dominant or active form (eg. a = 0 = absent in dominant form, as done below to create the table B:

TABLE B   PARADIGM TRUTH TABLE

                                              Conjunctural state

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M1 = abc = the fully unsustainable market   =   **(0,0,0)**

M2 = Abc = the deep socialism market   =   **(1,0,0)**

M3 = aBc = The deep economy market   =   **(0,1,0)**

M4 = abC = The deep environmental market   =   **(0,0,1)**

M5 = ABc = The red market   =   **(1,1,0)**

M6 = aBC = The green market   =   **(0,1,1)**

M7 = AbC = The socio-environmental market   =   **(1,0,1)**

M8 = ABC = Yellow sustainability market   =   **(1,1,1)**

The specific type of Pareto optimality reflected by each conjunctural state

i) The world under no Pareto optimality

In a world under no pareto optimality (NOPO) there is no clear system component dominance, the society is passive (a), the economy is passive(a) and the environment is passive (c) so A = B = C = 0 = absent, there are no social costs (SM), no environmental costs (EM) and no economic costs (ECM) accounted for so that SM = EM = ECM = 0; and there is no clear preference/choice structure, independent choice(IC), partial codependence choice (PCC) and full

codepedent choice (FCC) all are passive so that IC = PCC = FCC = 0 = absent, then its conjunctural state structure can be stated as follows:

5) NOPO = abc = (0,0,0)

Expression 5) above in conjunctural terms tells us that in a fully unsustainable no pareto optimality market (NOPO) there is a dominance free for all environment, there is a cost free for all environment, and there is a preference/choice free for all environment, where there is no Pareto optimality point as the unsustainable market price (USMPs) in the short term is for profit so that $USMP_S = SM + EM + EM + i = (0 + 0 + 0 + i) = i$ and in the long term $USMP_L$ tend zero (0) as profit seeking agents will bring the market into the ground destroying social, economic and environmental assets in the process so that:

6) USMPs = i --------------------→USMPL = 0, where i ≥ 0

Expression 6 above shows the expectations that for profit fully unsustainable markets in the short term ($USMP_S$) will tend towards zero prices in the long term ($USMP_L$) and to system collapse in the end.

<u>Definition of no Pareto optimality</u>: it is the state where everybody seeks to be better off while making others worse off, and the process repeats again and again until the system collapses, which has the conjunctural form M1 = (0,0,0). This is the point of no Pareto optimality based fully unsustainable markets.

ii) Deep socialism component based Pareto optimality

As in deep socialism Pareto optimality thinking (DSMPO) only the society is dominant (A = 1 = Present), only social costs are reflected in the pricing mechanism of the market (SM = 1 = Present), and only independent social choices/preference exists (ISC = 1 = Present), then its conjunctural state structure can be as follows

7) DSMPO = Abc = (1,0,0)

Expression 7) above in conjunctural terms indicates that in deep socialism market Pareto optimality thinking the economic (b) and environmental (c) components do not matter (b = c = 0 = absent), economic costs (ECM) and environmental costs (EM) do not matter (ECM = EM = 0 = absent), and only social costs matter (SM = 1 = Present). Here, the deep socialism market price at profit (DSMP = SM + i) or zero profits (DSMP = SM) clears the market, a free deep perfect social market under independent social choice/preferences (ISC) since ISC = 1 = present.

<u>Definition of deep socialism based Pareto optimality:</u> It is the state where no social agent can be better off without making other social agents worse off; and this happens when only social factors are reflected in the pareto optimality point, which has the conjunctural form M2 = (1,0,0).

This is the point of deep socialism based Pareto optimality, and this make it a point of full social independency

iii) Deep economy component based Pareto optimality

As in deep economy Pareto optimality thinking (DEMPO) only the economy is dominant (B = 1 = Present), only economic costs are reflected in the pricing mechanism of the market (ECM = 1 = Present), and only independent economic choices/preference exists (IEC = 1 = Present), then its conjunctural state structure can be as follows

8) DEMPO = aBc = (0,1,0)

Expression 8) above in conjunctural terms shows that in deep economy market Pareto optimality thinking society (a) and environmental (c) components do not matter (a = c = 0 = absent), social costs (SM) and environmental costs (EM) do not matter (SM = EM = 0 = absent), and only economic costs matter (ECM = 1 = Present). Here, the deep economy market price at profit (DEMP = ECM + i) or zero profits (DEMP = ECM) clears the market, a free perfect deep economy market under independent economic choice/preferences (IECC) since IECC = 1 = present.

Definition of deep economy component based Pareto optimality: It is the state where no economic agent can be better off without making other economic agents worse off ; and this happens when only economic factors are reflected in the pareto optimality point, which has the conjunctural form M3 = (0,1,0). This is the point of deep economy based Pareto optimality and therefore, this is a point of full economic independency. Notice that paradigm M3 has the same conjunctural structure of traditional market optimality a la Adam Smith pointed out in expression 3) in the introduction as M3 = DEMPO = (0,1,0) = TMPO.

iv) Deep environmental component based Pareto optimality

As in deep environment Pareto optimality (DEMPO) thinking only the environment is dominant (C = 1 = Present), only environment costs are reflected in the pricing mechanism of the market (EM = 1 = Present), and only independent environmental choices/preference exists (IENC = 1 = Present), then its conjunctural state structure can be as follows

9) DEMPO = abC = (0,0,1)

Expression 9) above in conjunctural terms highlights that in deep environmental market Pareto optimality thinking the social (a) and the economy (b) components do not matter (a = b = 0 = absent), social costs (SM) and economic costs (ECM) do not matter (SM = ECM = 0 = absent), and only environmental costs matter (EM = 1 = Present). Here, the deep environmental market price at profit (DENMP = EM + i) or zero profits (DENMP = EM) clears the market, a free perfect deep environmental market under independent environmental choice/preferences (IENC) since IENC = 1 = present.

Definition of deep environmental component based Pareto optimality: It is the state where no environmental agent can be better off without making other environmental agents worse off ; and this happens when only when environmental factors are reflected in the pareto optimality point, which has the conjunctural form M4 = (0,0,1). This is the point of deep environmentally based Pareto optimality, and therefore, this is a point of full environmental independency.

v) Red market or socio-economic based Pareto optimality

As in red Pareto optimality thinking (RMPO) both the society and the economy are in dominant form (A = B = 1 = present) and the environmental component does not matter (C = 0 = c = absent), only socio-economic costs are reflected in the pricing mechanism (SM + ECM), and only codependent socio-economic choices exist (COSECC = 1 = present), then its conjunctural state structure can be indicated as follows

10) RMPO = ABc = (1,1,0)

Expression 10) above in conjunctural terms points out that in red Pareto optimality thinking the environmental component does not matter (C = 0 = a = absent), environmental costs (EM) do not matter (EM = 0 = absent), and only socio-economic costs matter (SM = ECM = 1 = present). Here, the red market price at profit (RMP = SM + ECM + i) or zero profits (RMP = SM + ECM) clears the market, a free perfect socio-economic market under codependent socio-economic choice/preferences (COSECC) since COSECC = 1 = present. The structure of the perfect red market was shared in detailed (Muñoz 2016a)

Definition of red market or socio-economic based Pareto optimality: It is the state where no red agent or socio-economic agent can be better off without making other red or socio-economic agents worse off ; and this happens when only social and economic factors are reflected in the pareto optimality point, which has the conjunctural form M5 = (1,1,0). This is the point of red Pareto optimality or socio-economic friendly Pareto optimality, and therefore, this is a point of partial codependency.

vi) Green market or eco-economic based Pareto optimality

As in green Pareto optimality thinking (GMPO) both the economy and the environment are in dominant form (B = C = 1 = present) and the social component does not matter (A = 0 = a = absent), only eco-economic costs are reflected in the pricing mechanism (EM + ECM), and only codependent eco-economic choices exist (COEECC = 1 = present), then its conjunctural state structure can be indicated as follows:

11) GMPO = aBC = (0,1,1)

Expression 11) above in conjunctural terms stresses that in green Pareto optimality thinking the social component does not matter (A = 0 = a = absent), social costs (SM) do not matter (SM = 0 = absent), and only eco-economic costs matter (EM = ECM = 1 = present). Here,

the green market price at profit (GMP = EM + ECM + i) or zero profits (GMP = EM + ECM) clears the market, a free perfect eco-economic market under codependent eco-economic choice/preferences (COEECC) since COEECC = 1 = present. The structure of the perfect green market was pointed out in simple terms (Muñoz 2016b) as well as its green Pareto optimality structure (Muñoz 2020).

Definition of green market or eco-economic based Pareto optimality: It is the state where no green agent or eco-economic agent can be better off without making other green or eco-economic agents worse off; and this happens when only environmental and economic factors are reflected in the pareto optimality point, which has the conjunctural form M6 = (0,1,1). This is the point of green Pareto optimality and hence, it is a point of partial codependency.

vii) Socio-environmental component based Pareto optimality:

As in socio-environmental Pareto optimality thinking (SENMPO) both the society and the environment are in dominant form (A = C = 1 = present) and the economic component does not matter (B = 0 = b = absent), only socio-environmental costs are reflected in the pricing mechanism (SM + EM), and only codependent socio-environmental choices exist (COSENC = 1 = present), then its conjunctural state structure can be indicated as follows:

12) SEMPO = AbC = (1,0,1)

Expression 12) above in conjunctural terms shows that in socio-environmental Pareto optimality thinking the economic component does not matter (B = 0 = b = absent), economic costs (ECM) do not matter (ECM = 0 = absent), and only socio-environmental costs matter (SM = EM = 1 = present). Here, the socio-environmental market price at profit (SENMP = SM + EM + i) or zero profits (SENMP = SM + EM) clears the market, a free perfect socio-environmental market under codependent socio-environmental choice/preferences (COSENC) since COSENC = 1 = present.

Definition of socio-environmental component based Pareto optimality: It is the state where no socio-environmental agent can be better off without making other socio-environmental agents worse off; and this happens when only social and environmental factors are reflected in the pareto optimality point, which has the conjunctural form M7 = (1,0,1). This is the point of socio-environmental Pareto optimality, and hence, this is a point of partial codependency.

viii) Yellow sustainability market based Pareto optimality:

As in yellow sustainability markets (YSM) based Pareto optimality (YPO) or true sustainability markets(TSM) based Pareto optimality (TSPO) all components are in dominant form (A = B = C = 1) as all components matter here, then all costs, social,(SM) economic(ECM), and environmental(EM) costs, are reflected in the pricing mechanism (SM +

ECM + EM), and only codependent socio-eco-environmental choices exist (COSECENC = 1 = present), then its conjunctural state structure can be indicated as follows:

13) YPO = TSPO = ABC = (1,1,1)

Expression 13) above in conjunctural terms stresses that in yellow or true sustainability Pareto optimality thinking all components, social (A), economic (B), and environmental (C) matter (A = B = C = 1 = present); and hence, all costs matter and need to be accounted for (SM + ECM + EM). Here, the yellow sustainability market price (YSMP) or the true sustainability market price (TSMP) at profit (YSMP = TSMP = SM + ECM + EM + i) or zero profits (YSMP = TSMP = SM + ECM + EM) clears the market, a free perfect socio-eco-environmental market under codependent socio-eco-environmental choice/preferences (COSECENC) since COSECENC = 1 = present. The structure of the perfect sustainability market was described in detail (Muñoz 2016c) as well as its nature as a unifying force (Muñoz 2025).

Definition of yellow sustainability market based Pareto optimality: It is the state where no yellow sustainability agent or socio-eco-economic agent or true sustainability agent can be better off without making other yellow sustainability agents or socio-eco-economic or true sustainability agents worse off and this happens when only social, economic and environmental factors are reflected in the pareto optimality point at the same time, which has the conjunctural form M8 = (1,1,1). This is the point of true sustainability based Pareto optimality, and hence, it is a point of full codependency.

Specific implications

Looking at the traditional pareto optimality thinking not as a general definition but as a specific dominant component based definition it is possible to expand it to cover all possible forms of dominant component based paradigm thinking; and this extension comes handy at two levels of analysis: i) We can extend it to other paradigms within the same lower level of analysis such as to cover deep social markets and deep environmental markets and see similarities and differences between different forms of deep market thinking; ii) we can extend it to other paradigms that exist at higher level of analysis like red markets, green markets, socio-environmental markets, and true sustainability markets; iii) we can use the new knowledge at the same level of analysis to understand situations related to pareto optimality flip and flip back dynamics within the same level of analysis; iv) we can use the new knowledge created at the higher level of analysis to understand pareto optimality paradigm shift dynamics towards true sustainability based pareto optimality that are possible in one step or two steps following the concept of internalization or inclusion of components, costs, an preferences as we move from lower levels of responsibility paradigms to higher levels of responsibility paradigms.

General implications

1) In today's world traditional pareto optimality should be seen as it is, economic component specific based pareto optimality, it only works under the conjunctural state of the traditional market optimality point, meaning TMOP = (0,1,0); 2) The expansion of traditional pareto optimality thinking to capture the expected dynamics of other possible perfect markets, at the same level of analysis or at a higher level of analysis requires defining the specific type of pareto optimality under which each market, including the traditional market, operates; 3) The definition of one paradigm does not work in the other as each paradigm has specific conjunctural Pareto optimality structure and state; 4) The conjunctural state of deep level paradigms can be used to see how a deep paradigm can be flipped to another deep paradigm and flip back such as the flip from deep traditional market optimality to deep social market optimality or deep environmental optimality and vise a vise to understand for example green Marxism and red Marxism threats to capitalism from a pareto optimality point of view; 5) The conjunctural state of deep level paradigm can be used to see and understand the different two steps and one step paradigm shifts possible to leave deep pareto optimality thinking behind on our way to yellow or true sustainability based pareto optimality while appreciating how model structure, cost structure and preference structure have to change from paradigm to paradigm on our way to full market responsibility; 6) The conjunctural state framework presented here allows from understanding pareto optimality flips and pareto optimality paradigm shift in ways consistent with the respect or disrespect for the theory-practice consistency principle and of the expectations of the Thomas Kuhn's scientific paradigm evolution loop as paradigms flips or shifts forward or backwards; and 7) When we move from an independent conjunctural state to a partial or full codependent state such as a move from traditional market optimality to green market optimality or to red market optimality or to yellow sustainability based optimality, then impossibility theorems like the arrow impossibility theorem no longer work (Muñoz 2016d)

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