Chapter 3

The concept of collective choice and social welfare

3.1. Introductions

The title of chapter says that it is concerned for social policy and combines with preference and aspiration of members of society. When you consider society as an independent entity in that case preference of member can not be the society preference. Karl Max objected idea of making society as individual and given no importance to the individual member of society.

The main thesis of the book is to find out the 1) Social choice plays great role for dependence of judgment and 2) public policy on preference of members.

The deciding factor is preference of members of society. Say to decide the percentage of tax on one commodity. Its optimal revenue is one thing and public opinion to build the flyovers in the city is a different thing. These things are in relation to society.

There is a big gap in the need and desire of people as stated above, in the collective choice to take a judgment. The collective choice is a diverse subject and number of things is incorporated in it. The field of collective choice is very vast. It can be subjective as well as objective. Here the social welfare is pertaining to policy and decision. Policy and decision implementation are very important. Therefore, it is objective.

Individual is the member of society and society as a whole is the aggregates of members. Here the individual will insist for his goal or a community may come in picture and force for their demands or the matter of equality may crop up and many more things happen in collective choice. In this situation we may have many different theories in the collective choice. We have to decide the system, nature, operations and implication of the subject. After that, one can go ahead in these decisions.
**Ingredients of collective choice**

Social choice is based on individual preference than we have to find out the form in which it is relevant. Kenneth Arrow took the orderings of the individuals over the set of alternative social states to be the main ingredient of collective choice. He made function of an individual preference ordering as a social preference ordering, a rule in collective choice. Now the ordering is a ranking in each other as well as with all alternates. The rank must satisfy the three things to begin with. Here the ranking termed as "At least as good as".

1. It must be transitive. Here if X is at least as good as Y and Y is at least as good as Z than X should be at least as good as Z.
2. The relation must be "Reflexive". i.e. every alternative X must be thought to be at least as good as itself. This is mild condition.
3. "Complete". Complete means any pair of alternatives X and Y either X is at least as good as Y, or Y is at least as good as X.

It is understood that man knows fully well about his choice. Some times man is in such a position that he can not understand the difference between indifference and completeness. Indifference means not in a position to decide and completeness means a firm choice with full consciousness.

The example of indifference is 1) "X is at least as good as Y" and 2) Y is at least as good as X.

In case of completeness Y may be as good as X and X may be as good as Y.

Arrow saw a point that the individual is seeing the ordering on alternative social state and society is supposed to have an ordering on the set of individual ordering. Arrow's view can be criticized in following ways. Dr. Amartya Sen says first of all the transitivity condition is violated in this

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1 Dr. Amartya K. Sen, Collective choice and social welfare. Page no.2
situation. Example: - If X is preferred to Y, Y is preferred to Z, and Z is indifferent to X then there is a best alternative in every choice situation. Here Z is indifferent therefore transitivity condition infringed. In case of pair (X, Y) X can be preferred, (Y, Z) Y preferred and (Z, X) EITHER can be chosen. Now X is selected in all the three (X, Y, and Z) because X is at least as good as rest of the pair. The rationality is violated. One can ignore the transitivity in social choice.

Second thing is regarding completeness. Example: - X is preferred to Y and Z. Now Y and Z are not comparable. This is incompleteness though we can choose X in x, y, z. The completeness is desirable. We can ignore this depends upon the nature of choice. When one is unable to satisfy the completeness than the transitivity and reflexivity is preferred. The preference relation known as “Quasi – ordering” in technical term.

Third thing is the social choice should take in to account the intensity along with individual ordering. The cardinal welfare function should be taken in individual case.

Example: - Person 1 strongly wants that society chooses X and person 2 chooses mildly wants that the society choose y and not X, in that case X is good case to choose for both the persons. Here we are doing interpersonal comparison which is misleading. Here personal preference intensity is not in measurement.

Forth the point is Interpersonal comparison can be without cardinality and the concept can be applied in various modes. In interpersonal comparison we find new thing. Here the marginal gain and loss can be measure and or the welfare level. There is an argument that interpersonal comparison is meaningless as it is not based on choice.

Example: - The person A in social state of X or Person B in social state of Y. Person A in state X is an unemployed labourer and Parson B is well paid engineer in state Y. Here the comparison is there. In collective choice you can introduce the preference and not comparison.
The nature of individual preference

The interesting point is one can say that the social choice is dependent on social preference than why to study the individual preference. This has less relevance. Individual preference configuration will decide the effectiveness of collective choice. The society in which man lives is as per his class, his economical and social position, his personal choice. These affect his value system and his notion for other members of society. Self interest of man was in traditional economics. Preference relation was in relation to consumption theory and demand theory which has not helped in collective choice theory.

3.1.* preference relation *(Technical Part)*

*Binary Relations.*

Dr. Amartya Sen has given lots of mathematical terms to explain the thing in better way. This forms as $S \times S$. Earlier we show the transitivity, reflexivity and completeness. Now, out of so many mathematical terms we add three more for our purpose and they are Anti-symmetry, Asymmetry and symmetry. Let us examine these six things in relation to “at least as tall as” for measuring heights of all peaks of mountain.

1) When we say since a peak is as tall as itself, it is reflexivity. 2) Now if peak A is not at least as tall as peak B, than peak B will be at least as tall as peak A it is complete. 3) Peak A, being at least as tall as peak B which itself at least as tall as peak C. This is in relation to transitivity. 4) Peaks A and B could be of the same height without being the same peaks. This is anti-symmetric. 5) This is not asymmetric since A being at least as tall as B does not preclude the possibility that B will be as tall as A. 6) This is not symmetric as A being at least as tall as B does not at all impose any compulsion that B must be at least as tall as A. ²

We can use the term “taller than” which will not satisfy three terms out of six terms. Different authors use different terms for the same thing.

² ibid, page 8,
Maximal elements and choice sets

Here we define the relations of "strict preference" and "indifference". The definition of maximal elements is in binary relation; the elements of set which are not dominated by others in set. The "best" is defining as under. An element X can be called a "best" element of S if it is least as good as every other element in S with respect to the relevant preference relations.*

3.1.3.*, 3.1.4.*, 3.1.5.* A set of results of quasi-orderings, sub relation and compatibility, choke function and quasi-transitivity.

Here technically proved the naturally, to ordering and chains with partial ordering. Further it proved the rest of the two things.

Preference and rational choice

The choice function is incorporating the rational function in it. This is in binary relation which is full of rationality property. We can think in other way and rationality condition in as a property of a choice function. The definition of rational choice is-if some lemon of subset S1 of S2 is best in S 2 then it is best in S 1. Finally it proved that preference and relation in binary term as well as rational choice.

Revealed preference is further development in preference theory. Revealed preference is the choice restricted to certain sub set alternative. The result may be useful in certain area only. Revealed preference has taken hold of choice theory in general and of demand theory in particulars. Revealed preference is used for market as well as non-market choice also. The weakness of revealed preference is choice is between two choices only.

Now onward we will leave the technical part as the discussion is not much of interest and beyond the general understanding.

3.2. Unanimity

The Pareto criterion

Dr. Amartya Sen says PARETO gave idea of criterion of comparison of social welfare. He proposed two rules. (1) If every one in the society is
indifferent between two alternative social situation X and Y then the society should be indifferent too; (2) If at least one individual strictly prefers X to Y and every individual regards X to be at least as good as Y, then the society should prefer X to Y.

In case of (1) an either choice is safe. In case of (2), no one is interested in Y and some one is interested in X. The aggregate of individual is reflected in choosing X to Y as society, hence it is o.k.

We develop the concept of Pareto optimality. One has to choose X in alternative set. Now the alternative X is Pareto optimal and no other alternate is better than X as defined Pareto optimal. X is Pareto optimal as far as the society members considers at least as good as X and not a single member will say that one person will regard alternate better than X. ³

Now one person prefers X to y and another person prefers Y to Z in that case, it is not Pareto optimal. Pareto optimal is incomplete ordering, even though the reflexivity and transitivity is there. If two persons have opposite choice then also Pareto optimal will not work. Pareto optimal has limited use in precise circumstances.

Pareto optimal is very much useful in welfare economics in spite of its incompleteness. Some people are rich and some are extremely poor though the economy may be optimal. Here we have to tell rich to sacrifice for poor.

Pareto-inclusive choice rules

We are moving from individual ordering to social preference called “Collective choice rules”. There are number of collective choice rules. The “method of majority decision” is one of them. Many people prefer X as good as Y as prefer Y to X. ⁴ The complete preference of ordering is here which was not in the Pareto optimal. In MMD the pair is in consideration. MMD is Pareto optimal including CCR. CCRs which generate preference relations are better than Pareto relation. You can find out this in aggregates of

³ ibid, page no.21,
⁴ ibid, page no.23,
welfare or bargaining solution and of justice. Pareto optimal alternate is the best suitable for income distribution in the society. CCR inclusive of Pareto optimal is in a weak form because every one prefers X to Y as X is better than Y. Pareto superior of X is not possible. Individual preference over the pair and the same pair is in choice between alternate pair then it is simple. One may think that the social choice over X and Y depends on individual preference over other pair. Pareto optimal is incomplete and it need more as conditions or limitation of application.

Consensus as a Basis of collective action

The social action is heavily relying on unanimity. Dr. Amartya Sen says earlier Buchanan and Tullock had made great efforts in this direction. One exception in unanimity is decision regarding unanimity is too expensive. Unanimity is the satisfactory base for choice. To arrive at unanimity one should apply the change. Change is not effective than you should remain in status quo position. This is very conservative because one man can oppose the change. The change blocked, no matter what every body wants.

Buchanan and Tullock felt that politicians have forgotten about unanimity. The unanimity can come up during course of discussion and bargain. Unanimity may not exit in the beginning. People's compromise depends on own assessment and bargaining power. One social situation is accepted by society. Society is not binding for other social situation. Example: - In monopolistic labour market, labour accepts the term with an understanding that he may not get better term. This is a compromise position.

3.3. Collective rationality

The Bergson- Samuelson Welfare Function

All possible alternative state for the society has to take in to account for social welfare in scientific term. Bergson puts it in this way. “Social welfare can be thought to be a real valued welfare function, W, the value of which is

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5 ibid, page no.24
understood to depend on all the variables that might be considered as affecting welfare.\textsuperscript{6} \text{WE} can examine the "social indifference curves" in Bergson approach using Pareto indifference rule and conclude that every one in the society be indifferent. Scitovsky\textsuperscript{7} approach is that it requires two alternative bundles of commodity and if every one is indifferent in two bundles over the distribution of each over individuals. We can interpret this approach in Bergson way.\textsuperscript{8} The result will be some thing like this. Person 1 may be better off in X than Y, and person 2 may be better off in Y than in X, society might still be indifferent, if the overall social judgment is that the gain of one exactly compensates the loss of another.

Dr. Amartya Sen analyzed the Bergson approach and found the observation. The form of welfare function is not specified properly. The question of who provide the end-social welfare function-result is unanswered. Social order is not defined exactly. The choice in between alternate state, the function of W is not necessary to exist. Here the complete social ordering as R is necessary and this can be without welfare function of Bergson. Dr. Amartya Sen is not in favour of this idea.

\textbf{Arrowian Social Welfare Function}

Dr. Amartya Sen says Robbins attacked utilitarianism. Bergson and Samuelson\textsuperscript{9} gave rational thought to social choice. This has cleared the confusion in welfare economics. Arrow asked how individual preference ordering can decide the social welfare function-W and what should be the collective choice rule. Dr. Amartya Sen says Arrow's social welfare function is different than Bergson and Samuelson. According to Arrow the collective choice rule that specifies "ordering" for the society is called social welfare function.(SWF) Arrow's SWF is different type of CCR. Second thing particular type of rule meant for SWF applied to CCR and the result is

\begin{itemize}
\item[\textsuperscript{6}] ibid, page no.33,
\item[\textsuperscript{7}] ibid, page no.33,
\item[\textsuperscript{8}] ibid, page no.34,
\item[\textsuperscript{9}] ibid, page no.35
\end{itemize}
"Impossibility Theorem". SWF must satisfy certain condition of reasonableness. Again reasonableness is opinion therefore mild.

The general possibility Theorem

Dr. Amartya Sen discusses here Arrow's four conditions.

First, when we turn from individual preference to social preference than SWF should be wide enough to accommodate the individual ordering. In Pareto principal the unanimity is there but will not yield social ordering and hence it is not fitting in Arrow term. In case of MMD it falls in intransitivity area. The individual preference ordering should work in every configuration and in logical way. We will call it condition of unrestricted domain.

Second SWF must satisfy the weak Pareto condition.

Thirdly, Arrow requires social choice over the same alternate set on which individual ordering is only on those individual ordering alternatives sets. Here the social choice should remain same i.e. between X and Y. Election involving between Mr. A and Mr. B. It should be A vis-à-vis B and not A vis-à-vis some other person. We will call this condition of independence of irrelevant alternatives.

Fourthly, SWF should not be dictatorial. Here individual prefers X to Y than society can prefer Y to Z. This is known as condition of non-dictatorial.

Opinion of Arrow is no theorem can satisfy all four conditions how ever weak it may be.

A comment on the Significance of Arrow's Results

Individual preference and social preference combination leads to inconsistency. This was reflected in the form of "Paradox of voting". Consider three individuals 1, 2 and 3, and three alternatives X, Y, and Z. Let individual 1 prefer X to Y, and Y to Z, and individual 2 prefer Y to Z, and Z to X, and individual 3 prefer Z to X and X to Y. Here X can defeat Y by two votes to one. Y can defeat Z by same margin, so that transitivity requires

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10 ibid, page no.38,
that X should defeat Z in vote two. But, in fact, Z defeats X by two votes to one, here the MMD leads to inconsistencies. MMD applied to CCR. Here MMD satisfy the conditions of P, I and D but not condition U. MMD can be examined in “Rank ordering” system. This is not satisfying condition I. Here the position is of tie. In case of ‘change’ the value differs. This way we can examine number of possibility but in each case it requires specific conditions. We assume that there are at least two persons in the society and at least three alternative social states.

3.4. Choice versus orderings

Transitivity, quasi-transitivity, and Acyclicity

In SWF as collective choice rule, it requires reflexive, complete and transitivity. In case of ‘choice’ function transitivity can be skipped. The necessary of reflexive and completeness in choice function is defined as “Acyclicity”.\(^{11}\) If X1 is preferred to X2, X3, X4, and X5 and so on unto Xn. This is a weaker condition. In case of transitivity of indifference, it should X1 be strictly preferred to Xn. Transitivity is necessary for sets of three alternatives no matter how long the sequence is. In case of Acyclicity, all triple is acyclical and yet violate the rule.

Arrow's impossibility is applicable to SWF. Here the acyclicity in social preference can replace the transitivity. CCR generates the preference relation which is sufficient for choice functions and social decision functions—SDF. Arrow's impossibility is valid for SWF and not for SDF.CCR is sufficient for social choice and it satisfies all four conditions of Arrow. Arrow's impossibility theorem is the case of demanding social ordering and not the case of choice functions. CCR declares X to be socially better than Y if it is Pareto superior to Y and declares X to be socially at least as good as Y if Y is not Pareto-superior to X. Let us look at the ‘paradox of voting’. The CCR specify will declare X, Y, and Z to be all indifferent to each other. We consider two persons in CCR. Acyclicity will be there. Every

\(^{11}\) ibid, page no.47,
configuration of individual preference is true and satisfies condition U. SDF is satisfying Pareto condition and non dictatorship CCR failed on this count. “quasi-transitivity”\textsuperscript{12} is for triple. This quasi-transitivity helps us to move from social ordering to social choice and away from Arrow’s impossibility.

Collective choice and Arrow’s Conditions

Arrow’s conditions can be challenged and relaxation of a condition, the result will be demolition of theorem. According to Arrow, his conditions are inconsistent, but not sufficient for collective choice as satisfactory system. Arrow feels that they are necessary conditions for collective choice. Dr. Amartya Sen feels that he can prove that these conditions are sufficient and not inconsistent. Here you have to make Pareto optimal as indifferent; the distribution problem will be over. Quasi-transitivity will affect by way of dictatorial condition. We apply this result in all SDF than the conditions U, I, P, and D are satisfied. This will result in quasi transitivity and decision can be of “oligarchic” position. Here some people of society will prefer any X to any Y than society must regard X to be at least as good as Y and if all members of the group strictly prefer X to Y, then society must also prefer X to Y. In case of SDF, quasi-transitivity is not necessary as acyclicity is sufficient for choice function. In light of above Arrow’s impossibility theorem is not at all important. SDF is able to pass the examination of Arrow theorem.

Rationality and Collective Choice

Let us examine the Arrow theorem from one more point of view. Rational choice based on best alternative exists in each subset. There is indifferent condition in between X is preferred to Y, Y is preferred to Z and Z is preferred to X. Choice function exists and X is unique in all three choice function as X is no worse than other two. In case of two, each one is best as it is as good as other. You can not say it is rational in case of one as X; it is

\textsuperscript{12} ibid, page no.49,
to be chosen from the triple. The reason is it violates the property "b". If two alternatives and both are best in a subset, then one of them should not be best in the whole set, without the other also being best in that set. There is another condition in which if X is best in a whole set, than it must be best in all its subsets also. The both things are good in all respect for all CCRs.

If two alternatives are both best in a subset, then one of them should not be best in the whole set, without the other also being best in that set. Choice function generated, in SDF, there for it is SWF. When we impose choice function on above proposition then it becomes impossibility theorem in SDF also. We have to forgo one of the conditions of Arrow for consistency in this regard. Here the property 'b' condition is better than all four conditions of Arrow in connection to SDF. We can go ahead without property "b" because it satisfy property “b” in choice function and get converted into SDF to SWF. There is many more dilemma and many more conflicts other than Arrow impossibility which require thinking for collective choice function.

3.5. Values and choice

Welfare economics and value judgments

The term welfare is concern to the society. Society is a group of all people. Welfare can only be a policy recommendation. In case of choice between the social states is described as X and Y, in that case X to be chosen. The recommendations are in a sense value therefore welfare economics is value judgment. So many economists thought that welfare economics is value free. The debate is going on with notable economists on this subject. Earlier Hicks had define that "if A is made so much better off by the change that he could compensate B for his loss, and still have something left over, then the reorganization is an unequivocal improvement."\textsuperscript{13}

The philosophical thought of "ought" is very much necessary in welfare economics rather than to eliminate from "is" proposition in economics. There are other propositions in ethics. Economists started doubting the

\textsuperscript{13} ibid, page no.56,
compatibility of this in logical form as law. New welfare economics has nothing to do with this. When you say "value free" and "ethical Free" then it becomes the interpersonal conflict free. The hidden assumption is if every one agrees on a value judgment then it is "objective".

Pareto optimal is for individual and comparison is between two. It is subjective. Robinson 14 thinks that the value judgment in economics is difficult in interpersonal comparison. Hicks were also of the opinion that when you talk about the compensation then the interpersonal conflict does not come in the picture. The compensation is paid to individual for better off. Samuelson concluded for welfare economics as "The only consistent and ethic-free definition of an increase in potential real income of a group is that based upon a uniform shift of the utility possibility function for the group." 15

The value judgements in welfare economics can not analyze but in common sense some are agreeing and some are not. The point is the value free in welfare economics is some what not suitable. Value judgment is acceptable to all.

Content of Welfare Economics: A Dilemma

We defined welfare economics concern with policy recommendations. This will be of three types (1) some factual premises (2) some value judgment and (3) Some on logic.

Now the factual premises concerns positive economics. The second proposition is of scientific type and it can not argue out or discussed. The third one is related to logic. Some one will question that welfare economics exists or not. Mr.Graaff is not in favour of welfare economics.16 Baumol put it "an ill concealed resemblance to obituary notices".17 This is all due to the factor of reasoning. But the reasoning is grossly misleading due to it based on arbitrary definitions.

14 ibid, page no.57,
15 ibid, page no.57,
16 ibid, page no.58,
17 ibid, page no.58,
We discuss all three one by one. Dr. Amartya Sen proves that the logical exercise in policy recommendation in welfare economics cannot be ruled out. Logic is the heart of analysis or mathematical calculation or informal argument or formal as logic. One can accept as discipline or logic is his convenience. Logical reason is important for policy recommendations as a part of welfare economics. In traditional economics, existence, efficiency, stability and competitive general equilibrium were based on logic.

Secondly the value judgment set is based on individual ordering reflecting in social ordering. This is social welfare function in the definition of Arrow. The important point is, here we move from individual preference to social value based on public choice.

Lastly, economists think that the value judgment has very limited scope. The controversy is not useful for nature of value judgment, as it is not recognized fully.

**Basic and non-basic judgments**

Dr. Amartya Sen does a partition between basic and non-basic with specific reason. The definition of basic value judgment is it should apply under all conceivable circumstances. The opposite of this is non-basic. Let us examine this statement. "A rise in national income measured both at base and final year prices indicate a better economic situation". \(^{18}\) This basic statement can be a non-basic in value system as soon as the person changes saying that "if circumstances were such and such." When some people say that killing is justifiable in that case it implies that person should not kill human being.

The relevance of factual consideration in ethical debates is the distinction in basic and non-basic partition. Some one makes a statement of value judgment more basic than it is non-challengeable, in a sense of factual or analytical. The value judgment is non-basic than it is disputable in factual

\(^{18}\) ibid, page no.59,
and analytical sense. One should not misunderstand the value distinction.  

Factual circumstances can not be taken as probable.

Example: - A says "Men and women should be allowed to dress as they like.  
B says "Even if it turned out that mini-skirt caused cancer in the eyes of beholder?"  
A says "Not in that case, of course. But I do not think that situation very likely." \(^{19}\)  
The analysis of this is not giving any result even though it is non-basic and factual one.

Value judgment can be made conditional in certain circumstances. In non-basic value judgment do not violate the conditions. Dr. Amartya Sen says" On rainy days,  
I should carry an umbrella". This is a basic value judgment. I want to make non-basic value judgment than I should suggest some thing else on rainy day.

All the basic value judgment sets are not consistent in terms of logic then they are non-basic. The example of perfect logic is as under. A man judges that "Consumption today should be maximized" and another statement "consumption a year hence should also be maximized".\(^{20}\) These both the statements are in conflict only under factual circumstances. Here if you wish that every one's income should be higher than national average than there is analytical problem.

Facts and Value  

One person puts a value judgment. Another person denies it. This happens because they differ on what should be chosen in some alternatives given for choice. Here they can discuss the reasons whether it is value judgment or not. There is no reason to accept or deny it. But it could be accepted or

\(^{19}\) ibid page no.60,  
\(^{20}\) ibid, page no.81,
denied on factual or on logical grounds. Only the factual or logical propositions are not the reason to consider value judgment as non-basic. Hume said factual or logical could be one of the reasons amongst other reasons. One person's value judgment can be disputed on scientific grounds of validity by way of examination on factual premises or logical derivation. The reasons for rejection of value judgment could be only scientific. The basic judgment in value system can not dispute by way of factual or analytical method. Non-basic judgment is dependent on particular factual assumption. You can move to another judgment independent of previous factual assumption.

Dr. Amartya Sen says Robbins said, "It does not seem logically possible to associate the two studies (Ethics and Economics) in any form but mere juxtapositions. Economics deal with ascertainable facts, Ethics with valuation and obligations." 21 This is true only in case of ethics deal with basic judgment. It is difficult to judge the end as a basic or non-basic. We disagree about means than it can be resolved by way of scientific analysis. The disagreement about morality of taking interest will be non argumentative. In this approach, it is very difficult to find out whether it is basic or non-basic.

We have to find certain judgment in this value system is basic or not. The answer to question may not be conclusive due to two reasons (1) person may not be able to ascertain all the convincible alternative factual circumstances (2) he would decide to change the judgment in any case or not. He will be inconclusive.

Person can have suitable revision in factual assumption and he can change his judgment in light of any factual assumption. By this process you can not establish the basicness but it is basic in all sense. No value judgment is demonstrably basic but some are non-basic. We can assume that

21 ibid, page no.62,
supposition is wrong then non-basic is basic. A constrain may convert the non-basic value judgment into basic judgment.

Look at this statement. "A rise in national income at every set of positive prices implies a better economic situation". This is non basic value judgment. Now we convert this into "basic" then we have two way results. (1) In case of fundamental value judgment to which a rise in national income corresponds, when the income distribution is no worse. (2) We can ask the person about the acceptance of the statement that "a rise of national income indicates a better economic situation, if the income distribution is unchanged". It is difficult in second method to ascertain that one value judgment belongs to this group only. You can not decide the rational argument beyond point in value judgment.

Individual ordering and Choice rules

Let us start the discussion with individual position. Mr. A firmly prefers the social state of X to state Y. Mr. A is strongly anti dictatorial in his thought. Here Mr. A will face the conflict of opposite things. If Mr. A recommends choosing Y then he goes against his own choice. If he recommends X then it is dictatorial, against his principle. This thing happens in collective choice. Individual value affecting two ways (1) Individual preference (2) Concern with Collective choice rule. Here both sets of judgment are non-basic due to conflict. This conflict can be resolved with understanding that the CCR is incorporating the individual preference and convert it in to social ordering. One can see this thing in the process of selection of professor in university. In the first round they will vote to various candidates and in second round they vote chosen candidate. So selection becomes unanimous for the candidate.

In opposite case, individual will stick to their preference and preference R will be a way for public policy. Here R is social ordering. It is possible that the individual preference may not get included in CCR. Occasionally the individual preference can change the CCR mechanism. In the French
revolution, the demand of equality, liberty and fraternity were extreme dissatisfaction against existing Collective choice mechanism.

It becomes tough when a person approves the CCR and wants his own ordering to be included in public policy. This is not possible. In special case, the CCR is the result of his choice social ordering included as recommendation in public policy. In general any one set is non-basic, possibly both.

Harsanyi has division the preference into “Subjective preference “and “Ethical preference”. The personal actual preference is the subjective preference. Here the preference of individual will be called as ethical preference. The ethical preference is in which a person will get equal chance in any one position, if he had thought. Harsanyi is of the consideration that each person has maximum expected utility.22 Person can choose moral value CCR in between possible CCRs. A chosen CCR will be called as an ethical CCR. This is a thing of aggregation and nature is of general approach.

Conditions on choice rules

Let us go deep and examine the value. Values can create conflict in the CCR. The best example is of Arrow’s impossibility theorem. In this case, conditions like U, P, I, and D when imposed on CCR subject to condition O (i.e. on a SDF) will conflict. Here the logic of condition U is some what different. The rest of three conditions are suggesting what should be done given certain configuration of individual preference. Here it is a matter of specification or qualification. In case of condition U it is a positive aspect that CCR should work for all possible individual preference. It is quite possible that certain configuration of individual preference may not occur. If some one believes that some configurations will be ruled out in practice than condition U is not necessary in CCR as well as SWF. At subtle level conflict

\[\text{ibid, page no.66,}\]
may prevail for not having plausible in a CCR but objectionable in some configuration of preference that might not be very plausible.

Let us look at the condition independence of irrelevant alternatives in CCR. MAY-economist has proposed a set of conditions.²³ The condition of anonymity, here you have my preference and I have your preference. This way it goes on. It means individual preference is permitted than social preference should remain invariant. Neutrality condition requires no discrimination in alternatives. Here the socially X is as good as Y then W should be as good as Z. The criteria of X are replaced by W. In the situation of positive responsiveness, individual and society preference have positive relationship. Previously X was as good as Y, now X moves higher status in some one preference than Y and not falling in any one preference than X is socially better. MAY says this type of CCR is only considered as MMD (Method of majority decision).

Dr. Amartya Sen has discussed the various things like, transitivity, acyclicity in the light of MMD and found that absence of any one condition will give result of impossibility position. The possible solution is, we should make responsiveness as "Negative responsiveness" then the problem of quasi transitivity and acyclicity will be solved. We can prove that Pareto incomparable pairs are socially indifferent by putting in CCR as X is socially better than Y and if some one prefers X to Y and every one regards X at least as good as Y in Pareto extension. Pareto extension is not agreeable in the distributional judgment to some people. They may hesitate to reject other conditions. This proves that CCR is having Pareto extension. There is a difference between Pareto extension and MMD. The MMD is not satisfying quasi transitivity in social preference. Pareto extension does not satisfy positive responsiveness. Arrow's "Positive association" is still weak condition compare to "Non negative responsiveness". May's positive responsiveness and Arrow's positive association takes us away from MMD and Pareto extension rule. It is difficult to judge the conditions in isolation;

²³ ibid, page no.68,
The CCR nature will be non-basic and requires precise circumstances to examine.

3.6. Conflicts and dilemmas

Critique of Anonymity and neutrality

Many actual collective decision procedures violate the condition of Anonymity and neutrality though they are powerful. The anonymity condition is fulfilling in case of U.N.O. general assembly voting. It decides that procedure is simple majority and matter of substance requires two third majorities. In Security Council of U.N.O. special veto power granted to five countries. This violates the condition of neutrality.

The free market allocation procedures under capitalism or socialism are non neutral and non anonymous. I choose my consumption basket and you choose your consumption basket. After this our preference will result in different social out come though social alternates are same. This violates the condition neutrality. Example of market mechanism: - I prefer my wall to be blue rather than white. You have opposite choice and society is indifferent. As per market mechanism I will get my wall painted in Blue. I want to substitute your colour but market mechanism will not allow the change. You will have your wall painted in white. This violates neutrality condition. The market mechanism failure will be defended as “externality”. The values of individual freedom of choice are more important.

Liberal values and an Impossibility result

Some social choices are personal. Say. Mr. A lies on back when he sleeps (X) every thing else being equal, Mr. A lies on his belly when he sleeps (Y). Now suppose Mr. A prefers opposite (Y to X) where as many other want to be opposite (X to Y). Here only Mr. A is involve---one person. Some times the one person choice may turn into CCR. This is a condition of liberalism. This is very weak. Here more than one pair and more than one alternative are available. The condition L is demanding more. We further develop this thing into two individuals and one pair of alternative. This will be known as
L*-minimal liberalism. In SDF, if we impose the condition of L* than it is inconsistent with condition U and condition P. The result will be completely different than Arrow's impossibility theorem. Condition L* is stronger than condition D of Arrow but much weak in term of liberalism. Arrow's conditions are applicable only to SWF and not SDF. The SWF and SDF conditions can be explained by various examples. Let us consider the social choice with three alternatives. In case of three, the every alternate will be worst. There is no best alternative or no optimal choice possible.

Critique of Acyclicity

Any particular pair of alternative and unrestricted domain has no conflict between Pareto principle and minimum liberalism. One can reject pair-wise choice and not to generate choice function out of social preference relation. If condition P and condition L* is not relaxed and configuration of individual preference ordering in choice mechanism working than acyclicity has to go. There is no point in selecting A from A, B, and C and rejecting A in A and C pair. Property is most appealing condition. Rejection of acyclicity is a short of cheating. Acyclicity is social choice for non-pair wise. The discussion is highly technical and examining various things in alternative and opposite ways giving lots of new possibility in choice function at individual as well as interpersonal level and society level.

Critique of Liberal Values

Condition L* is minimal liberal. Here person's personal affairs are unsupportable.

Example Mr. A's wall colour may be disturbing to Mr. B. than it is Mr. B's business as well. If it makes Mr. A unhappy that Mr. B should read "Lady Chatterley's lover" while awake, than Mr. A is relevant party to the choice. Major thing like pornography, is a point of view for public policy. Here public policy is imposed on individuals, as others will, for which the particular individual is not concern. The condition L* is very weak as per the opinion of Dr. Amartya Sen. The condition L* is in relation to two person for one pair of
alternative per person. This is a form of most limited expression of freedom of individual. This violates the privacy of individual as it is forced upon him.

Critique of the Pareto Principle

Every one knows that Pareto principal is in weak form. We have to know who prefers what but also why he has that preference. Mr. A does not wish to read the book "Lady Chatterley's lover" himself if the choice is between his reading it but wants to deny Mr. B. the advantage of reading it. Here Mr. A's preference ordering diverts from value of Mr. A's preference. Here the preference for Mr. A's reading the book "Lady Chatterley's lover" vis-à-vis Mr. B's reading book. According to Dr. Amartya Sen one should not think too much about others preference. This should be ignored.

The above reasoning takes us to different stage than Pareto principle. First thing is does social choice depends on individual preference or some thing else. The reason can be other thing changes the status of concept of collective choice rule. The result will be the social choice can not be an individual preference function. Second thing, one can argue that the collective choice mechanism can not work on information of such a complicated nature. This can be a cause of individual ordering. It can take into account in to consideration by taking preference over other alternatives pairs. In such a situation, CCR is violating condition I. Now the condition satisfies Pareto principle even though it is objectionable. One can say that individual preference between X and Y is insufficient information for social choice in X and Y. To say that Pareto quasi ordering as "the unanimity quasi ordering" is not correct because unanimity is on a particular pair only.

The consequence of rejection of Pareto principle will be heavy in the field of collective choice in general and welfare economics in particular. The political choice mechanism is Pareto inclusive. The externalities are present in free market allocation therefore the Pareto optimality is absent. In externality, Pareto optimal should be a forgettable thing.
The irrelevant alternative condition is in the Pareto principle. This condition is not useful against the concept of unusefulness of the thing. This is in indirect sense only. Mr. A’s reason for preferring to read the book “Lady Chatterley’s lover” himself rather than giving it to Mr. B may be based on A’s expectation of B’s social behaviour after he reads “Lady Chatterley’s lover”. One can see that Mr. A’s preference ordering has not given enough ground for not reading by Mr. B. In case of Pareto principle you can doubt the same.

**Critique of Unrestricted Domain**

Condition U is important in theorem of collective choice. Number of configurations of individual preference having the condition of P and condition of L* are in agreement. These terms are not in agreement in reality. The reason is individual freedom is not guaranteed in collective choice mechanism. The problem can be dismissed by way of respecting individual privacy and personal choice. When the individual preference falls under specific pattern than Pareto principle disturbs the minimal liberalism. This type of reasoning is to ridicule condition P in Pareto principle. In CCR, individual preference actually will decide the goodness or badness rather than the logical conceivable pattern. In CCR the certain restricted domain and secondly differently restricted domain may be in conflict then we might chose set of individual preference keeping an eye on it.

**3.7. Interpersonal aggregation and comparability**

**Independence of irrelative Alternatives**

Rank ordering covers in SWF where condition U, P and D is satisfied but not condition I. We saw the relation between condition I and liberal condition. Opening of condition I have number of possibility in which one of the possibilities is of rank ordering. Utilitarian approach is ruled out in condition I. The condition of independence of irrelevant has number of possibilities on relaxation and this should be explored. Individual utility aggregation is not dependent on condition I. The definition of CCR is negative for condition I. The CCR is completely unchanged when the utility measure is changed but
individual ordering is not changed. This is applicable naturally to SWF and SDF type CCR. In case of change in definition of CCR and utility measure is admitted than in that case condition I will be a problem.

Social choice involving X and Y and individual ranking for third alternative is violating the condition I. This is “irrelevance” aspect. Social choice involving X and Y and individual ordering over X and Y called as preference of intensity. This we call ordering aspect. The irrelevance is mostly a part of “ordering” aspect of condition. Each individual has cardinal utility scale than irrelevant alternative has no place for construction of scale. Social choice is positive after adding all the difference in utility between X and Y for individual. It is declared that X is preferred than Y. Now the utility difference is negative in that case the preference will change to Y in place of X. This violates Arrow’s condition of independence of irrelevant of alternatives. This is not true. It is the violation of “ordering” aspect with out involving irrelevance. You have to fix two points on utility scale and this violates the other alternatives. Preference intensity is used for interpersonal correspondence in social aggregation. Here the preference intensity violates both the ordering aspect and irrelevant aspect.

Comparability, Cardinality and Discrimination

One can see the reflection of interpersonal comparability in individual utility units. Von Neumann-Morgenstern approach is to calculate individual utility scales than interpersonal comparison problem does not arise. Interpersonal comparability will change as soon as you make unit double of one person, living others on same scale than it is individual arbitrariness. In utility, the measure is one to one. In behaviourist measure, it is degree Say Happy, happier, happiest. LITTLE in 1950 put this concept. Here the interpersonal comparability is there. Here you can make marginal comparison.

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24 ibid, page no.92,
25 ibid, page no.92,
Now we have to examine two things (1) cardinal measure of individual welfare and (2) rule for interpersonal comparison.

Cardinal measure of individual welfare is based on assumption that individual can not have infinite level of discrimination because he can not make fine comparisons. Individual can make out the minimum utility difference from one level to another level. We can get cardinal measure of utility between two discrimination levels. This can be put in positive linear transformation. Individual is indifferent between all alternative in same discrimination. Cardinal measure is originally belongs to Borda and further developed by Armstrong and other economists.26

Goodman and Markowitz made development in interpersonal comparison.27 They assumed that the ethical level is the same from one discrimination level to another discrimination level for each individual and independent from the level effected the change. This is very easy thing. You want to compare the alternative X to alternative Y. Find the difference from original level to change level in one alternative in positive or negative sense. This approach is not practical in real life. From analytical point of view also difficult but it is important in the field of economics.

The criticism of this approach is observation of limited level of discrimination of individual in given fixed set of alternatives. A new commodity is available to person than independent effect is not there in X and Y alternatives. Ethical assumption is difficult for all people, as person’s perception is different by emotion. The social welfare of individual will be different. One say "HORRIBLE" another say "GOOD". Here the ethical assumption is objectionable and not the condition I. The ethical assumption appears as arbitrary and objectionable.

26 ibid, page no.93,
27 ibid, page no.93,
Uses of von Neumann-Morgenstern Cardinalization

The behaviour of a rational person in no risk situation can be explained in ordinal utility. The situation may change in risk condition. Von Neumann-Morgenstern provides a set of utility number corresponding to set of alternatives for behavioural satisfaction to attempt the maximum utility numbers.

Marschak had given the simpler formula. Marschak suggested a system with four things (1) Complete ordering (2) Continuity (3) non-different prospect being sufficient (4) equivalence of the mixture of equivalent prospects.

Number one, two and four are not sustaining on test from various type of alternative combinations. Say for complete ordering. A person climb mountain and survival in love of danger, percentage can be from 95% to 80 % to 1%, out of 100 %. In case of continuity, person is poor and has a thought of sin to play gamble. There is an equal chance for prosperity by playing the gamble and a chance of loss. As soon as he decides to gamble, the purity destroyed. This violates the continuity. Neumann-Morgenstern correctly pointed out for fourth condition that it is opposite in nature. Person may play for “thrill” for once in his life. People are having simple attitude for gambling. Arrow commented that utility indicator is not useful for social choice.

Arbitrariness is objectionable in any cardinal scale and independence of action set. Arbitrariness is in cardinal as well as in other scaling also. In case of ethics, particular set is chosen even though it is having arbitrariness. One can justify the gambling for equal chances in individual preference in social choice. Cardinal measure is entirely personal. The method of normalization of Interpersonal invites criticism.

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28 ibid, page no.95,
Partial comparability

Cardinal measurability is problem with first utilitarianism and after interpersonal aggregation. In case of aggregate welfare, one can debate the famous incident. When Rome was burning, the king Nero was playing fiddle. Here the welfare of Romans had gown down and Nero was delighted. The interpersonal comparison is between two Romans and not Roman and king. This can not be done. The welfare has gone down in any case definitely. The sum total of welfare went down as a consequence. This is a case between non comparability and full comparability.

Dr. Amartya Sen says Robbins (1932) and others failed to distinguish between SOME and TOTAL comparability. Now let us go further and compare the welfare from one to one, to MANY to MANY in cardinal fashion. We take three people and three alternatives. We use the formula of worst for zero and good for one. This is cardinal fashion welfare.

Table: - Tentative welfare indicators.\(^\text{29}\)

<table>
<thead>
<tr>
<th>Individuals</th>
<th>Alternatives</th>
<th>Alternatives</th>
<th>Alternatives</th>
</tr>
</thead>
<tbody>
<tr>
<td>A</td>
<td>1</td>
<td>0.90</td>
<td>0</td>
</tr>
<tr>
<td>B</td>
<td>1</td>
<td>0.88</td>
<td>0</td>
</tr>
<tr>
<td>C</td>
<td>0</td>
<td>0.95</td>
<td>1</td>
</tr>
</tbody>
</table>

In case of C the difference from Y to X is sharp (0.95) to (0) and in case of A the difference from X is mild from (1) to Y (0.90). If we multiply this by ten times than the difference for A from X to Y is only one point. Where as in case of C from Y to X is 9.5 (measure 0.95 x 10 = 9.5). Here aggregate result is incomplete but in choice function, Y is the best. The rest of writing is

\(^{29}\) ibid, page no.100,
highly technical and covering many aspects of ordering in partial and full comparability.

Adding ordinal-type welfare

Utility measurement for individual is difficult. There can be more than one cardinal measure but ethically it is difficult to establish the superiority. All the systems are accepted than it will not transform in linear like cardinal. We say this as ordinal. We can obtain quasi-ordering aggregates for individual with ordinal and partial comparability. In special case of classical utilitarian approach, aggregate welfare maximization for analysis in collective choice. Here complete comparability and cardinality is used as general frame work.

3.8. Cardinality with or without comparability

Bargaining advantages and collective choice

In collective choice, individual welfare has three problems (1) measurability of individual welfare, (2) interpersonal comparability of individual welfare and (3) Social preference relation in individual welfare function and comparison assumption. These three are interdependent. NASH gives solution for "bargaining problem". He takes "products" as against sum in individual welfare. The failure to hit a bargain will create the status quo position. In case of bargain, the parties are in status quo position and problem will be trivial due to absence of bargaining contract, this will not hurt any one. If both are choosing status quo position than in cooperative position, there will be a problem. In status quo cooperative position both are choosing same set than there is trivial and they can chose the outcome which will be best. In bargain and in cooperative position both will gain, where as in contract one will get more and other will get less. This is a case of individual behaviour in uncertainty. Here change of origins and individual utility function is in invariant position. The original is out and units simply changed. In this process interpersonal comparability is absorbed.

30 ibid, page no.118,
One individual unit is in variance and systemically it relates with other unit then the social state ranking may not be sensitive. This relation is in correspondence to one to one, yield complete ordering or none; in case of Pareto preferences and indifferences which are reflected in social choice. Nash had wiped out this by making use of status quo. This different status quo point will generate different solutions.

The non cooperative outcome depends upon the objective of exercise. We have seen the status quo position in bargaining position and in contract position. Zeuthen had put forward the same idea like Nash and Harsanyi had noted that concession will bring the result like Nash formula. 31 Definitely Nash solution is not ethical. Example:-The best prediction is not fair or just out come in circumstances like unemployment workers agreed to work in subhuman wages and poor service term in absence of contract then to starve. There may be contract between labourer and employer, but labour has poor bargain power.

Harsanyi's ethical judgment model is useful in case if he thinks that he has equal chance in either party position. In absence of equal chance, what he will predict will be all together different. Apart from Harsanyi's ethical judgment model, there are other models also like aggregate welfare maximization with partial comparability or fairness and justice of Rawls and Economist Suppes model of "grinding principle" in collective choice mechanism as the method of majority decision. 32

Dr. Amartya Sen says HARSANYI's (1955) model of "Ethical judgment" is useful here. Like that, MR. Braithwaite's (1955), 33 a tool for the moral philosopher is also interesting. The situation is somewhat like this. Mr. A likes to play piano and Mr. B is playing Jazz on trumpet. If both play simultaneously, there is disturbance due to imperfect soundproof walls. If

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31 ibid, page no 120,
32 ibid, page no.121,
33 ibid, page no.121,
Mr. B plays trumpet will be more harmful to Mr. A than Mr. A will play piano to Mr. B as less harmful. Author's final solution is to recommend the divide up timing. Here more timing given to Mr. B as Mr. B prefers both of them to playing at once to neither of them playing; where as Mr. A prefers silence. Here Mr. B has a threat advantage in absence of contract. If Mr. B is unaware of this threat advantage, he might propose equal sharing of time. This will emerge as actual bargain. A solution based on the threat advantage of the two parties indeed manifestly unfair.

Some people are in favour of prediction of out come. This is not correct. The ethical judgment is useful for three things. (1) This is an objective study and useful for improvement of collective choice mechanism. (2) The bargain power in society is a useful function for better social choice mechanism. The feeling of injustice will find out the agency to solve the problem. The Rousseau’s analysis of “Injustice” and Marx’s theory of “Exploitation” are the example of bigger impact on society. (3) There is often conflict between principle and action chosen by people. The principle is a part of collective choice and action is an analytical part for social decision. This will check in society the consistency of principle and action. The ethical judgments models are not useful in value judgment about principle of collective choice. Ethical judgement talks about 1) Status quo 2) Threat advantage and 3) Complete avoidance of interpersonal comparison are minus points.

**Cardinality and impossibility**

Social preference as individual welfare function redefined that the status quo position violates the condition of “independence of irrelevant alternatives”. The social choice in two individual taken as cooperative then this will result in impossibility theorem. This is for cardinality in absence of interpersonal comparability. Social welfare function is one social ordering for one individual. The transformation of individual welfare function, in no comparability, leaves the social ordering unchanged. In cardinality it is a condition that transformation of any utility function in any individual is permitted. We can modify Arrow’s conditions to suit social welfare function.
We show that we have to make change in independence of irrelevant alternatives and remaining three will redefine easily. Here social preference invariant as individual utility measure remains invariant. These all four conditions will turn SWFL in to impossibility theorem. Earlier we show that variance is possible to some liner transformation in individual units for interpersonal comparability. With unit comparability of cardinality, aggregation of SWFL satisfies Pareto principle, condition of D and condition I. When cardinality is combined with non comparability will fail to generate from individual welfare function to social ordering.

3.9. Equity and justice

Universalization and Equity

Simple definition of interpersonal comparison is to put oneself in position of another person. Sidgwick explained it as what ever action any of us judges to be right for himself, he implicitly judges to be right for all similar persons in similar circumstances. Hare explained it in detail. Hare converted it into meaning rather than mere principle. Suppose that I say to someone “You ought not to smoke in this compartment,” and there are children in compartment. Here “Ought” refers to some general principle. Suppose that I say to someone “You ought not to smoke in this compartment,” and there are children in compartment. Here “Ought” refers to some general principle.

Now let us see the difference between “immoral” and “ignorant”. If a white South African claims that apartheid is good, but concedes that his judgment would have been different if he were himself black, then in Hare’s system he would reveal an ignorance of “The way in which the word ‘good’ functions”. In contrast, if the criterion was taken as a moral principle and not as a matter of meaning, then the white South African in question could be called, in some sense, immoral, but not, in any sense, ignorant. From the above, one can think of two things: 1) the question of universalizability of value judgment and 2) as if interpersonal permutations given other things should be taken as “exactly similar” circumstances. Arrow had argued the universalizability in another context. According to him, “Value judgments

34 ibid, page no.131,
35 ibid, page no.132,
may equate empirically distinguishable phenomena, but they cannot differentiate empirically indistinguishable states". The concept of universalizability had two problems. They are either to be considered as 'logical' or 'normative rule'. This takes us to scope of thing. You take it logical, than it violates, so called Hume's law. According to Dr. Amartya Sen, if this is taken as a logical necessity, two states being factually exactly the same (a fact) seems to imply that they are equally good (a value judgment).

The scope of principle universalizability is important than logical or normative. As two things are not exactly alike, 'relevantly similar' comes in picture. Relevant similarity is a value judgment. Example: if X and Y are exactly similar except in some respects, and if a person's judgments in question involving X and Y are independent of those respects then X and Y are relevantly similar. Person's judgement is similar for X and Y when the two alternatives are relevantly similar.

We have to examine interpersonal permutations in light of similarity. Here Sidgwick principle of equity is the direct consequence of universalizability as positive. The negative of this is the question of relevant similarity. Moral judgment criteria are difficult in Hare's use of interpersonal permutations. Individual can not say honestly that he will hold exactly same judgment in interpersonal permutations. The mild form of moral judgment is in names of 'fairness,' 'justice' and 'ethical preference' has two things. These concepts apply to some limited categories of moral virtue and second thing individual is unaware of exact position.

Fairness and Maxim in Justice

Rawls principle of fairness is the result of fair agreement with no vested interest. He derives the principle of justice from this. Here the initial situation is fair and in original position. Interpersonal permutation is absence. Fairness and justice are applicable in cooperative bargaining situation in

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36 ibid, page no.133,
original position. Two principles of justice emerge from this fairness. (a) Each person has an equal right in liberty compatible in liberty for all (b) Inequalities are arbitrary unless they work for every one’s gain and open for all. This means it works for welfare of worst-off-person of society. The first thing is for liberty and second thing is for interpersonal conflict. We can find out here the worst-off person with the help of interpersonal conflicts. Rawls’ main theme is to apply for institutions to be chosen for maximum to order social state bases of individual ordering. This is useful in interpersonal welfare comparison.

Arrow suggested SWF. This procedure does not fit to Arrow's SWF as it is for one social ordering. The worst-off person welfare is going up in each alternative even though the individual ordering remains same. Here individual is I and X is state. The welfare of different people can be different. SWF does not permit this.

In case of CCR, the individual ordering takes place as ranking with interpersonal permutations. The statement would be Individual ‘I’ has a higher welfare level in state X and individual ‘J’ has in state Y can be translated. Now we consider M states and N ordering. In case of Rawls maximin ordering, one can obtained immediately as MN element, where as in case of CCR social ordering dependent on N ordering in M state. The ordering may be of individual or unanimous views of all. Unanimity will create the same problem like SWF and CCR. Maxim criteria in social decision will face some problem.

Example one: - Pareto stronger condition is violated. The welfare level of A and B in state X and Y is given in the table.

<table>
<thead>
<tr>
<th></th>
<th>Welfare of A</th>
<th>Welfare of B</th>
</tr>
</thead>
<tbody>
<tr>
<td>State X</td>
<td>10</td>
<td>1</td>
</tr>
<tr>
<td>State Y</td>
<td>20</td>
<td>1</td>
</tr>
</tbody>
</table>

37 ibid, page no.138,
The maximum rule will make X and Y indifferent. In case of Pareto Y is superior to X. The worst-off individual is no better off under Y than under X.

Example Two: - Here the inequality is not reflected in maximin rule, as it hides lot of issue related to equality in worst-off individual or worst-off individual group.38

<table>
<thead>
<tr>
<th></th>
<th>Welfare of A</th>
<th>Welfare of B</th>
<th>Welfare of C</th>
</tr>
</thead>
<tbody>
<tr>
<td>State x</td>
<td>100</td>
<td>80</td>
<td>60</td>
</tr>
<tr>
<td>State Y</td>
<td>100</td>
<td>61</td>
<td>61</td>
</tr>
</tbody>
</table>

The maximin rule indicates that Y is preferred to X. Welfare of group B and welfare of group C is reduced compare to welfare of group A in state X and welfare of group A and welfare of group B is widen in state Y. Inequality is difficult to judge in worst-off position to best-off position. Rawls insistence is on institutional frame work than individual. The minor gain wiped out in big gain of others. Here no trade-off position emerges. Rawls maximin rule is justified in the relationship of fairness.39 Fairness element is applying to all. Person does not know his attributes but joins in system which satisfies important value of moral system.

Person has pessimistic out look than in fairness the uncertainty will not achieve definite conclusion. Here the utility is not distributed like utilitarian concept.

The institution comes in picture. The suffering of man by religion or otherwise will mutiny and the big gain cannot wipe out the small loss. Maximine approach is for institution. Rawl's insistences to accept the maximine principle in original is not convincing. Hurwitz developed the pessimism-optimism index in which maximine has last consideration.40 You

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38 ibid, page no.139,
39 ibid, page no.139,
40 ibid, page no.140,
can apply it after generalisation. In Hurwitz concept the maximine original position assumption can be one out of many. Rawl should have taken the social ordering in centre. Institution approach against individual is different thing. Rawls approach to “principle of fairness” is more appealing than “principle of Justice”. The application of fairness in collective choice mechanism is like uncertainty in the same approach.

**Impersonality and expected utility Maximization**

Harsanyi has two sets of consideration for each individual. The first one is subjective preference as they actually are and second one is ethical preference which one can say impersonal. This impersonal concept is in line of Hare’s universalizability and Rawls fairness. The impersonality concept requires assuming the equiprobability. The ignorance of Rawls is some what equal here in equiprobability. Harsanyi is of the assumption that impersonality is in individual term and will satisfy the Von Neumann-Morgenstern rational behaviour under risk concept. Ethical preference is for utility maximum and this will result in maximization of utility for all.

Harsanyi thought for social choice. He put a theorem that if social preference and individual preference satisfy Marschak postulate and if everyone being indifferent implies social indifference, then social welfare must be a weighted sum of individual utilities.

Let us examine the impersonality. Example: - In one society 99 are free man and one is slave. If some one wants to replace the slave than will society morally support his Idea? The answer is, in case of “fairness”, this will not reflect as Rawls thinks for worst-off position. In case of Hare’s test, it requires much more than this. Here the equiprobability is the solution with putting self in that social position.

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41 ibid, page no.141,
Let us examine this from interpersonal point of view.  

<table>
<thead>
<tr>
<th>State</th>
<th>Welfare of 1</th>
<th>Welfare of 2</th>
</tr>
</thead>
<tbody>
<tr>
<td>X</td>
<td>1</td>
<td>0</td>
</tr>
<tr>
<td>Y</td>
<td>1/2</td>
<td>1/2</td>
</tr>
</tbody>
</table>

The explanation is, both are indifferent in state X and Y but from equality point of view, they will prefer state Y than state X. Here we calculate the welfare of impersonal and the exactness of distribution of welfare in individuals. Diamond criticizes Harsanyi’s “strong independence assumption” in social preference.

Let examine the table of Diamond.

<table>
<thead>
<tr>
<th>0.5 probability</th>
<th>0.5 probability</th>
</tr>
</thead>
<tbody>
<tr>
<td>Lottery1</td>
<td>Ua=1</td>
</tr>
<tr>
<td>Lottery2</td>
<td>Ua=1</td>
</tr>
</tbody>
</table>

Comparison between two persons and two lotteries gives result of sure thing principle. Here Two persons are as A and B and two lotteries as lottery one and lottery two. Lottery 2 seems unfair to individual B, while lottery 1 gives B a fair shake due to probability. Here the sure thing principle is rejected. Let us apply little change. We will make B’s value as two. We can say that lottery 1 is preferred now. No one has stated clearly about interpersonal comparability. We can conclude that Harsanyi needs unit comparability and Diamond needs full comparability in aggregation. Ultimately the lottery result will come as 1 to 0 and not egalitarian in independence assumption.

42 ibid, page no.14
43 ibid, page no.144
Utility maximization is doubt full proposal. We show earlier the argument of ½, ½ against 1-0. The first value is rather strong. Here the utilitarianism in general and Harsanyi criteria in particular will be indifferent, where as egalitarian distribution will favour this proposal. A Maximin criterion is for level of welfare. A utilitarian criterion is for social ordering with assumption of cardinality and unit comparability. Maximin dose not requires this. Ethical consideration is relevant for both. We compare the welfare unit of different people than it is utilitarianism with importance, where as if we consider welfare level than it is simple. This type of evaluation for social judgement is worse then interpersonal comparison we make.

Grading principles of Justice

Suppes' model of "grading principles" yields the partial ordering. Suppe devise the ethical rules for two persons. Here the act and its consequences found out. This is Pareto-like judgment in individual's own preference. This can be explained technically with the assumption of two persons and action and likely consequences. Economist Suppe's theory proves the partial ordering over the pair of consequences for individual. Let us examine this for interpersonal relation. Asymmetric and transitivity are the consequences. Suppe admits the element of justice and each person decides his strategy for game. First rule is to choose each point and second rule is to choose one point. This will not work as the behaviour is arbitrary. Suppes grading principle of justice satisfy the requirement of universalizability. Suppes principle does not require interpersonal comparison of welfare. This does not require any cardinalization. Suppes principle is incomplete in the rank ordering. The personal difference does not reflect in this principle.

In case of personal differences consider the "Test" of individual in case of choice of eating items. The Y is preferred in Pareto optimal where as in case of test; X is preferred by both of them. Here X is admissible in sense of justice. When you apply ethical than the result will be wrong. Here the person is having own test and for other's test also. Suppes model takes it as
subjective. The same thing is absent in Rawls and Harsanyi. The problem can be solved by changing the view from objective to subjective in others test also. Suppes grading principle does not have justice in a sense that interpersonal comparison is absent which makes principle to reformulate.

**Grading principle, Maximin, and utilitarianism**

Grading principle can be extended from two persons to “n Th” person societies. This will resolve conflict of maximin and utilitarian concept. In this case the larger welfare aggregates makes worst-off person to well-off person. The yield is strict partial ordering which is an incomplete criterion. The extended grading principle will give 3,628,800 different ways for “nTh” persons. This is much better in comparison to Pareto one to one position.

**3.10. Majority choice and related systems**

**The Method of majority decision**

Method of majority decision is studded more in collective choice rule. Borda (1770) and Codorcet (1785) there after Laplace (1814) and Lewis Carroll (1876) widen their interest in majority rule study. Majority rule has wide appeal and as a system in collective choice. MMD is satisfying most of the conditions of CCR and therefore decisive. CCR in which Pareto principle, condition U, condition D, condition I, Condition N, condition A, condition S are satisfied. MMD has minus point for intransitivity and acyclicity. The "paradox of voting" is the example of the same. MMD is not working for some configuration of individuals in SWF and SDF. MMD violates condition L and L*, which gives little scope for individual freedom. Problem of inconsistency will arise in MMD for some choices. You can not change decision procedure. Still MMD is used in social choice. MMD does not take in to account the intensities of preference. Here not mere number but how much is also important. Aggregation procedure is special case in utilitarian with weak assumption and it was threat for take over on MMD.

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44 ibid, page no.151,
45 ibid, page no.161,
MMD ignores comparison between absolute levels of welfare of different people. The notion of fairness of Rawls and justice of Suppes works against MMD. At institutional level, MMD is used effectively. Interpersonal comparison, intensities of preference and measurement of wellbeing is difficult in MMD. We use these concepts for value judgment. In case of choice, it is difficult to find out the private and public choice. MMD is passing all these problems due to independence of irrelevant alternatives, neutrality and anonymity. The simplicity, symmetry and primitive logic attract many.

**Probability of Cyclical Majorities**

Inconsistency in MMD is a problem. We have to find out the probability in case of no majority winner. Many economists have work on this. We have to find out assumption about the probability distribution in different individual ordering for each person. First assumption is all ordering are equally likely for every individual. Guilbaud confirm 8.77% probability of cyclical majority in strong ordering.\(^{46}\) He noted that there is less chance than 1 in 11 that no majority winner will emerge. Garman and Kamien also Niemi and Weisberge had obtained an exact pattern of equiprobability of there being no majority winner as numbers of voters differ.\(^{47}\) Probability impasses increase on the number increases but never to 1%. Niemi and Weisberg calculated the probability failure. The probability of cyclical majorities travels towards 1(one) as the number goes up. The equiprobability assumption is in favour of society.

Individual preference is the result of pattern of social, economical, political and cultural forces. The patterns are different. The difference will produce consistent and transitive majority decision. The Class war between two groups results in to transitive. Individual preference will avoid inconsistency choice. The question of motivation and interpretation is there. This may be either subjective or frequencies of different ordering. Much depends upon a person, who is well verse with the subject. The MMD can be thought in

\(^{46}\) ibid, page no.163,

\(^{47}\) ibid, page no.163,
connection of time say to day and T time-in future. This can not answer the probability. Further study can be done in light of more empirical date analysis.

Restricted Preferences

Black and Arrow defined the problem of cyclical majority as alternative approach as “Single-peaked preference”. According to them majority decision will be transitivity irrespective of the requirement for it. This approach makes use of qualitative pattern of preference provided total number of persons odd. The qualitative approach is different than probability approach. Here political rationality is major thrust. In single peaked preference is individual alternative in terms of some dimension and any pair-wise choice, vote for that alternative which is closer to one's position. There is extreme right and extreme left group both will decide their alternatives. In any case the number of voters is odd than majority decision will be transitivity. In absence of utility it will be single peaked because here ordering is taken in to account and not utility. Single peakedness does not require arbitrariness. Every triple alternative are arrangeable in single peaked position. Single peakedness is a partial agreement. Alternative can be best, medium or simple. This is a case of value restriction. The violation of value restriction will not affect transitivity. You select one from odd and give him some position. This will make equal number. Here the selected person is willing or not is a question. You can not omit the odd factor so easily. The oddness can be nullified in case of SDF and not SWF. In individual ordering strict value restriction is necessary than MMD is SDF. In individual ordering, other conditions are not strict, than value restriction will work as “limited agreement”. In case of “External restriction" is in the pair of X and Y and Y and Z, if Z is best than X should be worst in that ordering. Every one thinks that every one agrees that some alternative is at least as good as some alternative in each triple. The external condition is also

48 ibid, page no.166,
necessary. Limited agreement is easy to follow. The external restriction has three things known as "echoic preference", "antagonistic preference" and "dichotomous preference".

For majority condition of SDF rather VR, LA or ER which is necessary in each triple for majority decision of MMD in SDF. This is for rational choice under MMD. ER is a must in each triple for SWF in MMD.

**Conditions of collective choice rules and restricted preference**

Dr. Amartya Sen says, Inada (1969) find out three approaches. VR works a wide class of collective choice rules I.E. 2/3 majority.

L.A. works for CCR. Condition I, N and R and P* may be applicable to many other CCRs. In case of VR, these conditions are not applicable.

In case of E.R, it violets quasi transitivity even though CCR is N, A, R, and P* is there. If we convert R, negative response in to S positive response than it becomes MMD. When one takes MMD than E.R. is sufficient for full transitivity.

These are all technical terms. Further discussion is of high level and proves that it requires thinking in various ways for restricted preference.

**3.11. Theory and practice**

**Systems of Collective Choice**

There are different ways for base of social preference. There are number of preference of members of society. These two things are different. Arrow defined social welfare function in which social ordering specified for each set of individual ordering. Social decision function is based on choice. Social preference relation based on individual ordering. We can say that SWF is a part of SDF. Consistence factor is strong in SWF than SDF. This has resulted in to "impossibility theorem" and other results. SDF is having problem due to choice factor. SDF is having quasi-transitivity and acyclicity even though have problem for collective choice. The conditions are not

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49 ibid, page no.169,
reasonable then various types of SDF come in to existence. When you demand less from SDF, it is not necessary, social preference must generate choice function. A quasi-ordering is giving guidance in many cases though weak but useful in many CCRs.

Individual preferences are also of various types. The collective choice systems are based on more information regarding individual attitude to social alternatives, than conveyed by ordering. We can take help of utility function in cardinal, or ordinal or intermediate type and measure utility or welfare in interpersonal comparability. This comparability can be partial comparability for welfare and non-comparability to complete comparability.

We can switch from comparability unit welfare to level of welfare. Individual ordering for state can be converted into any individual and any state. We can use the criteria of fairness and justice at this place. This way we can analyse CCR in different types and have different results.

**Institutions and Framework**

Wide varieties and different angles give different CCR problem. Out of this we discuss now the institutional part for decision taking.

Here three possibilities are there (1) Majority rule (2) Rank order method (3) Social choice based on individual preference. Recommendation had from individual ordering set to every individual ordering sets. Second thing, in place of cardinal welfare, you can replace it with aggregate gains or losses on national level. Here you can have partial comparability. This will help planner to give policy recommendations.

Let us list out few important collective choice theories than many of them, some may be illusory.

(1) **Institutional mechanisms: -** In institution majority rule is applied. This satisfies the anonymity, neutrality, positive responsiveness. Complete free market is justified on the ground of Pareto optimality with Pareto extension as principle. Social institution can choose the condition L for individual freedom.
Planning Decision: - Here some body or committee responsible to government takes decision on the bases of individual preference for aggregate welfare and to improve the condition of worst-off people. The maximin rule works implicitly or explicitly.

Social criticism: - This is used as protest against dissatisfaction from existing system. The CCR has to satisfy many conditions as problems are many and in different forms. The problem regarding the advice to government till overthrow of government. Many practical things have come from eminent person in the interest of public.

Problem of committee decisions: - Every institution has committee, may be large or small, may be formal or informal. The procedure may not be open for general public. They take into account the intensities of preference and formal decision will come forward and like vote trading, it is informal. In all cases transitivity is important.

Problem public cooperation: - Here the evaluation of collective choice by public is important. Many problems require justice and implementation of that justice in interest of public. Some economic decision will effects to public, in that case fairness, justice and gains and losses have to take into account. Population sacrifice and accept the future debt burden. This is in interest of population at large. The success and failure depends upon the cooperation of population.

Expression of individual Preference:-

Individual preference can be decisive in collective choice. There are difficulties. The game consideration may change individual preference. The honesty is important factor.

In some theory, voting is not in favour of personal interest. This point is examined from various method of collective choice system even than it is not sure that it will work in proper way as desired. In social ordering, cardinal
measure and communication are serious problems. Murakami is of the opinion that non negativity response to individual preference will limit the scope of distorting their preference. This is true for MMD. There are three people and three preferences. In process it can say that X is most preferred. Y is next and Z is there after. Now some one wants to bring Y in the position of X, he can not do it, but can knock out X in the decisive vote in MMD. The example of four people and three preference, result can be distorted, in spite of positive responsiveness and rank ordering in MMD. Game consideration and voting may bring in measure of intensities of preference and can compromise conflicting interest. This is social choice and ethics is effective element. The probability is important factor in individual preferences. This is like lottery in which result is probable. One can say that individual vote does for maximizing his utility. The answer is negative. The probability is to record the presence is more than true purpose of voting. Person may indifferent even than vote or prefer to absent in light of cost. This may be one problem out of many but it affects to choice theory.

Efficiency and Pareto Optimality

In collective choice, ordering is less problematic than ordinal measure. In economics, Pareto Optimal is most widely used approach. It is seen that most of the conditions are satisfied by Pareto Optimal. The condition of indifferent is disturbing. This condition of indifferent restricts the general conditions of collective choice rule. Pareto optimality is necessary but not sufficient condition for optimality. In case of two individuals and freedom given to them, even than, it violates acyclicity which is weaker than transitivity. Pareto optimality can not be taken as a goal.

Concluding observation

Pareto principle is mildest. Pareto optimal can not used as universal principle and as absolute in collective choice rule. Simple principle is non

50 ibid, page no. 193
basic and use of it with suitable facts can play havoc with general principle in universal application. The universalization and generalization requires ethical theories to make application in economics. General Principle can work on the above basis but general principals are not that type. In general principle conditions are based on very limited view such as anonymity, neutrality, relevant similarity, and information between individuals and alternatives along with preference intensity. Independence of irrelevant alternatives, preference incentive and personal motivation are the factors in Pareto principle. Here the criteria is more important then approach. Simple principle is useful in some cases and not in all cases. Simple principle is useful and provides shortcuts than it is welcome. Arrow's general principles and impossibility theorem should be considered as a positive contribution to collective choice system.

As soon as we know the nature of principle as non-basic, we should over rule it. In traditional welfare economics the Paretoian judgment is compelling as well as non Paretoian judgment as arbitrary. Paretoian consideration is on one hand put traditional welfare economics in narrow box and on the other hand ethical invulnerability will not survive. The evaluation of non basic principles could depend upon nature of society. "Pure" system of collective choice in social decision is good for theories and studies. This pure is well known but limited with impurities. The "impure" elements may be more practical and useful to institution. This is the system of collective choice for society.

3.12. Philosophy of Welfare in collective choice

I have selected four chapters in my thesis in continuation to find out the philosophy of welfare in Dr. Amartya Sen's writing. Dr. Amartya Sen was chosen for Noble prize for his outstanding contribution in economics for collective choice theory. This leads us to welfare rather than mere development or economics activities. The human value is established by way of introducing philosophy in economics.
Welfare economics is not value free. "Ought" has to come in picture. Ethics and unanimous judgement are the bases of welfare economics. Welfare economics concern with policy recommendations. Welfare economics require help of Logic, factual premises and value judgement. Value can create conflicts in CCR (Collective Choice Rule), MMD (Method of Majority Decision) and Pareto optimal by applying different conditions. Ethical are basic judgement. The interpersonal comparison is not possible in welfare economic as it is for society. Harsanyi divided the preference in 1) Ethical and 2) Subjective. The condition of anonymity and neutrality is requires to be examined in CCR. The condition of anonymity and neutrality does not work in market mechanism. Market mechanism gives maxim to individual by way of sale, exchange or buy.

Preference and aspiration of society members is the social policy. Need and desire are different for member as well as society. Kenneth Arrow took individual ordering in collective choice. The comparison standard is "at least as good as". The preference is used as alternative in collective choice. The interpersonal comparison is meaningless in choice. Preference relation was in demand and consumption theory which is not that helpful in collective choice theory.

Pareto gave criteria in social welfare. These criteria are known as Pareto optimal and used every where. Pareto optimal does not work in opposite choice, weak in case of inclusive in CCR. MMD is another type of CCF (Collective choice function). CCR and Pareto optimal are included in this. Unanimity is a social choice and expensive in decision. Politicians have forgotten this. Unanimity suggests compromise. This way unanimity is useful in choice function. Social welfare has to take into account rationality and all possible alternatives. Bergson gave idea of real value function should examined as W (Welfare). It is incomplete as who will provide the social welfare. Scitovsky though that when individual is indifferent than society should indifferent. This social ordering R is necessary in CCR.
Arrow gave another CCR imposing four conditions. One condition of them is not fulfilled than it is not considered as CCR. The reasonableness is mild condition in CCR but puts hurdle in SWF (Social Welfare Function). An individual preference and social preference creates inconsistency. MMD failed in four conditions for SWF and rank ordering failed in four conditions. SDF (Social decision function) has choice function in Arrow impossibility theorem. Quasi transitivity is in CCR which goes away from impossibility. Rational choice requires three conditions.

When the change affected in individual preference it violates condition of I in Arrow theorem. The Preference intensity is in interpersonal correspondence violet both the aspects. In cardinal measure individual is indifferent. This is a practical problem and difficulty is in analysis. The behaviour of a rational person can explain in utility. Arbitrariness is objectionable in cardinal.

The bargain problem solve by taking product in place of sum. Sidgwick proposed the principle of "Equity" or "Fairness". The principle of "Exactly similar" has come up in line of equity or value. Rawls principle for fairness and justice is in favour of worst off people in institutional approach. Hurwitz contributed by way of pessimism-optimism index. Suppe grading principle resolves the conflict of maximin and utilitarianism criteria. Interpersonal comparison is not possible in MMD. MMD is having defects but favoured by institutions. Harsanyi has two sets of preference-1) Subjective 2) Ethical. Ethical is "impersonal" type. They are in line of universalizability and fairness. The impersonality is like equiprobability.

This collective choice function has to examine in connection of utilitarian and libertarian as well as in cardinal and ordinal fashion. We have to examine the possibility of interpersonal comparison. Pareto optimal is the better than best position.

Dr. Amartya Sen made it clear that the choice and preference are different. The reveal preference is amongst two sets only. In welfare, individual and his/her wellbeing is the prime thing.
Rationality is a part of preference. Pareto optimal is useful in welfare function. Dr. Amartya Sen has very correctly observed the effects of ethical judgment. The principal is a part of collective choice and action is of analytical part which is two different things.

The bargain, co-operation and contract are the worth examining substances. The co-operative formula will work well and in benefit of all. The contract requires full knowledge otherwise the threat and ignorant person has to pay heavily. The equity is important for welfare thought. The universalization is the result of equality. Here we have to talk about moral law, fairness and justice. We have to apply the value to interpersonal comparison and find out the likely effects on CCR, MMD, SWF and SDF. Here requires the transparency in government act. This will curtail people freedom in economic sphere, freedom of speech; freedom to express opinion etc. Here it costs to individual in welfare term and government purpose is not served in collective choice function.

The technicality of the subject is complex and it is beyond common man's understanding. The base of collective choice requires the discussion from all the angles. The above things come under broad theory of collective choice. Dr. Amartya Sen has discussed collective choice elaborately to give precise idea of the effect of the each and every function. Dr. Amartya Sen has solved the Arrow impossible theorem which was up till now a problem to take a decision at government level to implement the welfare program. This has given a new horizon in public economics and new direction to welfare economics.

The collective choice decides the human way of working to maximin the fulfilment of desire. The next topic is development as freedom. In this the freedom is best available option for person in political and economical term. We will study the same in detail.