

Leadership, Political Behavior and Commerce

Desmond Ayim-Aboagye

Regent University, College of Science and Technology
McCarthy Hill Campus, Accra, Ghana

Abstract

Earlier studies by Arrow have shown that uncertainty in elections causes conflict and increases cost. Accurate measurement which leads to easy acceptance of elections saves labor-time required to go over double counting. The purpose of this investigation is to unearth that good leadership and appropriate behavior, which is devoid of the observed conflicts in leadership, could cause and maintain efficiency in the stock market. The method utilized was the deductive approach. This approach provided the study with two distinctive theorems which were deduced from a renowned postulate that led the vital investigation of the study. The postulate that accurate measurement of political elections could eliminate social and political conflicts which characterize modern emerging states that want to do away with poverty and corruption. The results of the investigation reveal that the two theorems gained through the deductive approach permit efficiency to prevail in the stock market thereby fulfilling the first law of Welfare Economics. For they provide stability and equilibrium to the stock market and also caution market competitors about the effect social and transactional costs could have on their businesses. The first and second Welfare laws have been the fundamental building blocks worked upon and championed by Welfare and Behavioral Economists as contributing to market efficiency and market equilibrium. The study concludes, by asserting that we must be aware of social and transactional costs which conflict in the political arena cause to negatively influence the market. These transactional costs impede the occurrence of efficiency in the market and totally disorganize and cause disequilibrium to the market. Because these theorems caution us against the occurrence of social costs and transactional costs, they make the market much more efficient

Keywords: policy, theory, welfare economics, political behavior, efficiency

INTRODUCTION

What appeared as a popular scientific article in a popular Ghanaian Website has given us two new theorems for understanding the behavior of human beings in the spheres of political science, law, and economics. This author, a modern scientist, counting it important, has considered it more appropriate to provide us not only these theorems, but also the important theory that has much to offer the people of Africa and also to the world as a whole. No persons should receive this theory with gladness more than the citizens of the developed nations who consider it important to constantly guard against the encroachment into their market civil disturbances which negatively influence the direction of their economies. The aim of this article is to discuss briefly the Double Count Policy Theory and its two most important theorems, which could be a major contributing factor to the acceleration and management of modern commerce. Drawing essential insights from other leading theorists of the last century and the present, the author has managed to develop this

significant theory, and is for the first time being presented in a scientific journal.¹

STATEMENT OF THE PROBLEM

It has been observed that many African leaders are ignorant when it comes to market efficiencies and the advantages these have on the progress of a nation and its economic activities. These same leaders are not aware of the implication conflict has on the political sphere as well as on the stock market. In other words, many countries become embroiled in conflicts without considering the effects that these have on their market and its efficiency (Fama, 1965; Feldman, 1987). When leaders become concerned with the forces in the market

¹ This scholar is not the only researcher who has discovered a theorem through his popular scientific publications; Carnot, the physicist, first made his discovery of thermodynamic law under the footnote of his popular scientific book (the 1824 publication *Reflections on the Motive Power of Fire*). Many scholars, both in the past century and in the present, have followed suit. Arrow (1963) made the discovery of his theorem in his thesis. Coase (1960), on the other hand, made his first presentation in a not well expected first publication, "The Nature of the Firm" (1937). The Economist Stigler popularized Coase's theorem and also named it after the author.

that promote efficacy, more caution would be taken concerning public political attacks that could lead to potential chaos in their countries. The problem of this study is to unveil the theorems that could either turn on or off conflict situations that cause pandemonium to society thereby affecting market efficiency. It is therefore the purpose of this study to investigate how the two theorems deduced from the postulate could help to contribute to market efficiency and equilibrium.

LIMITATION OF THE STUDY

The study has some limitations which must be pointed out. In the first place there are many other factors that influence market efficiency which are not mentioned here. However, this is because the goal is to address political conflicts which some educated people, scholars, and most economists have not yet concentrated their analyses on. Kenneth Arrow has shown in his numerous works that uncertainty in the market could cause inefficiency in the market and his arguments, which include risk-taking in uncertainty, do not directly concentrate on political conflicts (Arrow, 1959; Arrow & Hurwicz, 1972). The present study makes a case that political conflicts could send the market tumbling if it is not curbed by responsible leadership or leaders who think and behave in an orderly manner like mathematicians (Hunt, 2007).

SIGNIFICANCE OF THE STUDY

This study is important not only to the leaders in the Third World, but also to the developed world as well since this discusses novel factors that can cause the market to degenerate into transient recession. It is asserted that having meticulous and consistent knowledge about these theorems will cause the world to know in advance certain major economic problems that can be averted as a result of uncertainty in elections since these theorems postulate on what can turn on or turn off crisis situations in the society.

DCP Theory

The DCP theory states that what occasion conflicts/wars involving elections between an incumbent and a strong contestant during political parties' elections for that matter is uncalled for, since both contestants could be allowed to use the election results they both secured to rule for one political term in office. This could satisfy the people as well as the party members. Especially, when one of these men has successfully won the election results with a smaller margin over the other stronger contestant that makes it impossible for the other to give up easily. If one contestant is made to rule after the other, it could prevent war and anarchy that can threaten the economy and progress of the country. The theory was purposely developed for the Third World

leadership; but both the developed and the developing nations could also benefit a lot by adopting its principles.

According to the DCP theory, four characteristics of leaderships make it impossible for the sound and smooth change to occur during leadership transfer:

1. **Robot Politician:** He enjoys the leadership routines, but does not put in much effort to fulfill them in an appropriate manner. Politics is a "love affair", and has an unlimited timetable.
2. **Absolute Zenith Complex:** His abnormal mentality makes it impossible to follow rules. He intimidates and persecutes potential politicians.
3. **The King Gene:** His inward personality gifts make him hang on to power like a King; he believes in leadership for life.
4. **The Puppet Politician:** He is managed by a manipulator, who makes him fulfill his dictatorial wishes, which includes his persecuting other political opponents.

The arguments of the theory that we take cultural factors into consideration when passing judgments and also become sensitive to human weakness are intelligible, if one considers the fact that these experiences take place in countries where democracy is underdeveloped, and there is no single language to employ. Strong solidarity among the different groups forming the nation is virtually absent in these countries. Politicians from the developed world have more advantage to overcome such a hurdle than the developing nations. It is the differences in cultures that make it impossible for politicians to accept the elections that bring smaller margins between two final contestants causing uncertainty and lack of stability to prevail in both the market and society.

POSTULATE AND THEOREMS

The two theorems that were deduced from the theory's postulate have a great deal to offer to the running of modern economy in the world since they also contribute to market efficiency. In this way the theorems help to fulfill the first law of welfare economics, which has affinity with law and political science.

POSTULATE

According to the DCP Theory, the "employment of election aggregates of the last two elections of the last two contestants of Presidential election will determine accurate measurement, which of the two won the elections mathematically; and this measurement will ultimately reduce personal and social conflicts, as well

as cost, which characterize modern elections. It effectively reduces the cost of human labor-time, required to produce another election and services involved in the repetition or double-counting of elections.”²

The two theorems were deduced from the above postulate. The first is “If two contestants μ and β , of two political parties A and B, should agree as to the claims of a final PE election without bargaining, these latter parties A and B, regardless of the circumstances surrounding the results would always accept their decisions as their own decisions without creating controversy about their joint acceptances.” This being the contestants’ theorem enables members of the parties A and B and the whole inhabitants N to come to a peaceful agreement, following the Nation X’s successful elections. The relationship between contestants’ μ and β and party members A and B concerning the overall decision making that could put the state of the affairs in the Nation X and its inhabitants N to be in equilibrium, is greatly stressed by the contestants theorem. This is seen as a boost to the image of the country across its borders and to a large extent the whole world in general. It generates a great deal of confidence in its leadership and the economic market activities by competitive partners. We could put the contestants’ theorem in another format such as this:

Contestants Theorem

Let μ and β be the two contestants of a presidential election (PE) in a nation X of parties A and B respectively. If at the end of nation X’s PE, μ and β were to agree to the results of the final PE, then regardless of the circumstances following the PE, Parties A and B will also agree and honor the election results. Thus, $\mu \in A$ as well as $\beta \in B$ will agree to the final decisions concerning the elections, making $PE = \mu \in A \cup \beta \in B$.

$$PE = \mu \in A \cup \beta \in B = \mu \in A + \beta \in B$$

Where $\cup$ represents the union/full agreement between the two parties and their candidates.

But as a conflicting situation may occur due to uncertainty in elections, the election results can sometimes become engulfed into a conflict K, and the more the controversy surrounding K becomes broadened, the more confusion it may generate among

the inhabitants N in the country X in question and probably across the neighboring borders of country X. If one of the contestants, either μ or β , decides to give up or quit the K; as he/she is resolved to give up, K will suddenly come to an end by the mere fact that one of the contestants of party A or B has decided to give up pursuing conflict K that could destabilize the whole nation/region. This theorem, which is known as the conflict theorem, postulates the chaos and disturbing nature of conflict K that could turn a serene atmosphere into pandemonium affecting the whole economic dynamics in the country. Presented in a scientific manner, the theorem could be stated as follows:

Conflict Theorem

Suppose in the political arena, a war /conflict K was to ensue; let these contestants who represent their parties A and B be μ and β respectively. Let these two contestants μ and β be involved in a major crisis K that have to do with country X elections of the presidential elections, PE. If now the K was to endure for some time and the nation X and its inhabitants N were to be dragged into it. But one of the contestants, either μ and β were to give up or quit; then K would be resolved in an easy manner that will bring peace and tranquility into the country X and its inhabitants N and probably its neighboring nations $X = (X_1, X_2, \dots, X_n)$ thereby making $PE = X(N) \mu \in A \cup \beta \in B$ to occur at once.

$$PE^k = X(N) \mu \in A \cap \beta \in B = \emptyset$$

OR

$$PE = X(N) \mu \in A \cup \beta \in B$$

Where $\cup$ represents the union/full agreement between the two parties and their candidates and the $\cap$ indicates conflict or disjoint set conditions (**between these two parties**) that could be represented by a Venn diagram. Figure 1 has an illustration with the combination of Set Theory and Topology. By the latter we have in mind connectivity, compactness, and continuity or how elements of a set are related spatially to each other.

Figure 1. Nationhood and Party Politics

Definitions

1. Let X be a certain Nation
2. Let N be the total population of that Nation X
3. Let μ become the contestant for Party A
4. Let β become the contestant for Party B
5. Let PE be a certain Presidential Election of Nation X

² See, Ayim-Aboagye, 2011. This article, which has been expanded for published in a popular scientific Website, was presented to a British Economic Journal. It was later worked upon seriously before its publication. See also Ayim-Aboagye, 2014a; 2014b & 2014c.

6. Let PE^k be conflict situation of Presidential Election
 7. Let dA be the degree of advancement of that nation
 [Pf = 1 ($\leq 50\%$), Sf = 2 ($\leq 75\%$), and Mf = 3 ($\leq 100\%$)]³
 7. Let $X = (X_1, X_2, \dots, X_n)$ be the neighboring nations

If $\mu \in A$

If $\beta \in B$,

Then $PE = \mu \in A$ and $\beta \in B$, or $\mu \in A \cup \beta \in B$, or $|\mu \in A \cup \beta \in B| = |\mu \in A| + |\beta \in B|$
 (By addition principle)

So,

1. $PE = \mu \in A \cup \beta \in B$
2. If $\mu \in A \cup \beta \in B \subseteq N$
3. Then $\mu \in A \cup \beta \in B \subseteq N \in X$

Election Conflict, Nationhood, and the Q-Formula

The total election (presidential) conflicts engulfing a nation X is, by definition, $PE^k = X(N) \mu \in A \cap \beta \in B = \emptyset$, where $X(N)$ is the Nation X and its inhabitants N and the elements $\mu \in A \cap \beta \in B$, representing the various political parties and their candidates. The most important political figures involved in the conflict being these; but sometime PE^k may spread to other neighboring nations due to uncertainty and the greedy nature of human beings, a subject that has been witnessed in the past centuries and even at present. We present this as a type of formula called Q-Formula in the form of a theorem; supposing the neighboring nations comprise $(X_1, X_2, \dots, X_n)$, that is, here in this instance $n = 3$ or finite set.

Theorem: Q-Formula

On PE^k that occur between $|\mu \in A| + |\beta \in B|$ and its N inhabitants that belong to Nation $X(N \in X)$, let PE^k infect other neighboring nations $(X_1, X_2, \dots, X_n)$. Then

$$\iint_t PE^k(dA) = \iint_r \mu \in A \cap \beta \in B = \emptyset \subseteq N \in X(X_1, X_2, \dots, X_n) ds$$

$$\iint_t PE^k(dA) = \iint_r \mu \in A \cap \beta \in B = \emptyset \subseteq N \in (X + X_1 + X_2 + X_n) ds \text{ (by addition principle)}$$

$$\iint_t PE^k(dA) = \iint_r \mu \in A \cap \beta \in B = \emptyset \subseteq N \in \sum(X + X_1 + X_2 + X_n) ds$$

³ Pf represents primary frontis, that is, stage 1 of development; Sf represents a little more advanced than the first stage, that is, secondary frontis; while Mf represents the most advanced stage of development dubbed as "superior" kind of development, that is, main frontis. The latter war or conflict can be more threatened with a nuclear war or it could simply be advanced such that only words war could be seen or utilized. Wars in the primary stage may be tribal wars.

The dA on the left side represents the degree of advancement integral of the particular nation. Where T is a point in time in PE^k , and R is the point in a region susceptible to k or conflict. Ds means outwardly directed conflict or war.

Theorem (Criterion for civil disorder)

Let $\mu \in A \cup \beta \in B$ be a close PE race in a Nation X and its inhabitants $N(N \in X)$, then there exist a unique tranquility such that $\mu \in A \cup \beta \in B \subseteq N \in X$ prevail. Let μ or β disagrees and protests of the PE results of X ; that changes the perception and mood of N , then $PE^k = \mu \in A \cap \beta \in B - N(X) = 0$, where $-NX$ represents a nation in a civil disorder.

$$PE^k = \sum \mu \in A \cap \beta \in B - N(X) = 0$$

Or

$$PE^k = \sum \mu \in A \cap \beta \in B = \emptyset$$

Market Efficiency and DCP Theory

Leadership is a very important factor for the growth of the economy of any country. Without good leadership many well-developed economies could not have survived in the financial tremors that engulfed the Western World recently, and also during the great depression in the 1930s (See also, Arrow 2002).⁴ It is because of this that we can assert with support from empirical evidence that, in the absence of external mediators⁵ that intrude on the political arena when dealing with political election issues and its decisions making, the market and its political atmosphere enjoy efficiency regarding normal allocation of resources and redistribution of wealth. Unfortunately, this outstanding progress is not experienced during conflict situations and uncertainty concerning election results; nations and their citizens endure sufferings from political destabilization that could lead to a major stagnation of economic progress (Arrow 1972). Individuals could have their basic wants impeded and scarcity could be forced into an entire economic system in a country with a vibrant economy. Fama's (1965) Efficiency Market Hypothesis,⁶ which is based on rational behavior in

⁴ Arrow's significant works are his contributions to social choice theory, notably "Arrow's impossibility theorem", and his work on general equilibrium analysis. He has also provided foundational work in many other areas of economics, including endogenous growth theory and the economics of information.

⁵ The Problem of Social Cost (1960) by Ronald Coase is also an article that deals with the economic problem of externalities.

⁶ The hypothesis has three major versions: "weak", "semi-strong", and "strong". The weak form of the EMH contends that prices on traded assets (e.g., stocks, bonds, or property) already reflect all past publicly available information. The semi-strong one of the EMH states that prices reflect all publicly available information and that

market analyses, informs us that the market situation is found transparent and enjoys equilibrium when market forces are well regulated in an efficacious manner for the economy. This fulfills the first law of Welfare economics. For economists, a market is not simply a “mechanism”; markets are concerned with peaceful exchange of goods and services by competitive partners.⁷ These sufficient conditions which make markets efficient such as transparency, efficiency, publicly accessible information, and distribution free of economic welfare are important. Moreover, when persons are not obstructed from dealing with exchanges in a competitive marketplace where no externalities in production or consumption exist, the resulting distribution of the economy is Pareto efficient; that is, no individual can be made better off without making some other person worse off (See, Arrow & Debreu, 2002).

Political Responsibility, Social Costs, and Welfare Economics

The works of Arrow (1963), Coase (1960), Mishan (1980), Arrow and Debreu (2002) and many others have taught us the necessity of taking responsibility in the market and also in the society, very seriously. According to Arrow,⁸ our behaviors may well have a great role to play in making us register successes or failures in these areas. Individuals cannot be pushed in the area of elections to choose arbitrarily; they have well-ordered preferences as regards whom they choose to represent them in order to steer their economic affairs. Coase, on the other hand, advises that we must be aware of social or transactional costs which persons grapple with in cases involving political and market settlements. This has to do with “time”, “money”, and the “effort someone loses” in obtaining what he wants during a controversy in the market or political system. We should fight less in order to reduce “friction” instead of contributing to this in the public matters. Thus, according to Coase, other costs, including search and information costs, bargaining costs, keeping trade secrets, and policing and enforcement costs, can all potentially add to the cost of procuring something from another party. Like Arrow’s theorem, Coase’s theorem, and many other pertinent theorems, the theorems

deduced from the theory of Double Count Policy are important for political decision making. Also, they contribute to efficient economic management in the fields of economics and politics which are usually beset with multiple problems that usher in major setbacks for modern-day progress in the world economy. Furthermore, similar to Arrow (1953; 1959) and Coase (1960), we find that any negligence on the part of human behaviors could turn to bubbles in the marketplace if transient recession is not put to check constantly.

The deduction of these two theorems unveils the fact that no external actor is needed in the decision making involving elections, aside from the people that work strenuously to choose their own leaders (See, Arrow, 1960). This is in contrast to what happens when election results present major escalation in the political arena due to failure of those contestants to agree. This also negatively influences market efficiency and redistribution of wealth. Our theorems also reveal the major responsibility which is put on leaders in this modern world. Not only are they supposed to show maturity in dealing with cases involving their opponents and election results in general, but they must also learn to be tolerant in matters involving these. If they fail to learn how to do the described at the initial stage, it will not speak well of themselves, their parties and its members who usually give their unwavering support when dealing with election intricacies that crop up regarding unforeseen circumstances about failure to win or perform well during elections. Leaders should deal with each other well in order to prevent any future “social” or “transactional costs”; these will allow them to enjoy all the support they need at the crucial stage of their political careers. It is always said that it is better to prevent conflict matters rather than to cure or address them later when they are already at danger zone especially in matters regarding political administration and its associated leadership conflicts. Significantly, these two political theorems caution leaders in regards to the use of appropriate methods in dealing with conflict and uncertainty situations in the field concerning economic distribution of wealth and services, and also in the political systems.

Conflict Theorem, Coase Theorem, and Market Equilibrium

Election situations that usually transpire when elections are unsuccessful and, as a result, not accepted in the larger society define the Conflict theorem. This theorem is essential because it allows for a separation of equilibrium atmosphere on the one hand, and a political conflict or chaos situation that ensues, on the other hand. The latter also has a significant bearing on market

prices instantly alter to reflect new public data. The final one, that is, the strong form of the EMH additionally contends that prices instantly reflect even hidden or “insider” information. It is thought that rational markets can be blamed for much of the late-2000s financial crisis.

⁷ See also Sen (1979); Yu (2012); Lewis (1997); Campbell (2002); Calsmiglia & Kirman (1993); Bator (1957).

⁸ Arrow’s theorem has significant consequences for welfare economics and theories of justice. It was extended by Amartya Sen to the liberal paradox which contend that given a status of “Minimal Liberty” there was no way to obtain Pareto optimality, nor to avoid the problem of social choice of neutral but unequal results.

equilibrium as has been shown by Arrow and Debreu (2002) in their analysis of a model which depicts uncertainty and stability.⁹ The non-acceptance of the strenuous efforts invested in executing the elections in the country in question can offer a negative forecast in matters relating to the economy. This can affect market equilibrium as competitors might not recognize this uncertainty situation as an essential condition to perform trade activities with market assets, such as stocks, bonds, or properties. Information accessibility may be tampered with which will indicate lack of efficiency in the stock market.¹⁰ The nation as a whole and certain individuals, who did not agree to the election results, including the opposing contestant and his party, will call for a recount or fresh elections to be commenced. This call will be made in compliance with the policy regarding elections and the unsuccessful elections that have resulted due to conflict. The hasty nature in which this will take place might not be conducive for the society to enjoy the peace and harmony which characterize peaceful exchange of goods and services in a competitive market.

Transactional costs and social costs are at the heart of political conflicts and instabilities that occur in the market and these have been demonstrated in the recent political battle that engulfed Ghana concerning the 2012 Presidential Elections. Here, the dismissed case involving the opponent's accusation that the ruling government rigged the elections caused enormous social costs when the nation became stagnant for a period of four to five months. This experience was the first of its kind and many scholars believe that it may not occur again for the foreseeable future because of the untold harm it generated to the economy of the nation. Ghana has not yet recovered from the shocks the economy received from these bubbles because of this prolonged case. The nation's stock market suffered a great deal as well.

CONCLUDING REMARKS AND IMPLICATION

Simply put, the DCP Theory states that it is possible to allow two strong contestants of PE to rule; one after another, when election results do not present a clear winner. Market efficiency requires stability, confidence, and the flow of accessible information in any country and these are what the theorems we have discovered prescribe. These two theorems can be put forward as the cornerstone of political elections that either turn off or turn on crisis state of affairs among parties in the process of electing a leader whose win could steer the

economic activities of the country. This implies that we must respect the choices people make in connection with the election of their leaders. Also, investigations should be made for appropriate ways elections can be successfully executed. Moreover, we should be more sensitive toward people's needs and the social and transactional costs which are avoided when individuals settle cases among themselves. These costs have to do with the money, time, energy, and strenuous efforts invested in cases that occur among parties involved in elections, or customers trading in stocks, bonds, and properties in the market. In conclusion, it can be argued that so far as these theorems prevent, guard against or caution on the occurrences of transactional costs, they make the political and market domains more efficient in their outcomes.

ACKNOWLEDGEMENTS

I thank Professor Gabriel Awuah, Halmstad University, Marketing Department, Sweden, Mr. Yaw Ayim-Aboagye, a Political Economist from Georgetown University and Dr Yaw Antwi Adarkwah, a Land Economist from University of Sheffield for very helpful comments on earlier drafts. Dr. Evelyn Owusu, PsyD, Regent University College of Science and Technology made enormous contribution to the final manuscript.

REFERENCES

- Arrow, Kenneth J. 1963. *Social Choice and Individual Values*, Yale, New Haven: Yale University Press.
- Arrow, Kenneth & Hurwicz, L. 1972. "Decision Making under Ignorance," In C. F. Carter and J. L. Ford (eds.) *Uncertainty and Expectations in Economics. Essay in Honour of G. L. Shackle*. Oxford: Basil Blackwell.
- Arrow, Kenneth J., and Gérard Debreu ed., 2002. *Landmark Papers in General Equilibrium Theory, Social Choice and Welfare*. Edward Elgar Publishing.
- Arrow, Kenneth J., 1951a. "Alternative approaches to the theory of choice in risk-taking situations," *Econometrica*, (19): 404-437
- Arrow, Kenneth J., 1953. "Hurwitz's optimality criterion for decision making under ignorance," Technical Report 6, Stanford University
- Arrow, Kenneth J. and Gérard Debreu 1954. "Existence of Equilibrium for a Competitive Economy". *Econometrica* 22 (3): 265-90.

⁹ Working with Gérard Debreu, Kenneth Arrow (2002) produced the first rigorous proof of the existence of a market clearing equilibrium, given certain restrictive assumptions.

¹⁰ See, Fama 1965. This is all EMH talks about.

- Arrow, Kenneth J., 1959. "Functions of a theory of behavior under uncertainty," *Metroeconomica*, 11: 12–20
- Atkinson, Anthony B. 1975. *The Economics of Inequality*, London: Oxford University Press.
- Ayim-Aboagye, D. 2011. "Double Count Policy Theory: A Contribution to the Critique of Political Philosophy/Economy." *Modernghana.com*, January 20.
- Ayim-Aboagye, D. 2014a. "Two Fundamental Theorems of Political Elections", *Modernghana.com*, March 29.
- Ayim-Aboagye, D. 2014b. "Predictability of the Two Fundamental Theorems of Political Elections" *Modernghana.com*, January 4.
- Ayim-Aboagye, D. 2014c. "Theorems of Political Behavior" *Modernghana.com*, April 12.
- Bator, Francis M. 1957. "The Simple Analytics of Welfare Maximization," *American Economic Review*, 47(1): 22-59.
- Calsamiglia, Xavier, and Alan Kirman 1993. "A Unique Informationally Efficient and Decentralized Mechanism with Fair Outcomes," *Econometrica*, 61(5): 1147-1172.
- Campbell, D.E. and Kelly, J.S. 2002. "Impossibility theorems in the Arrovian framework," In *Handbook of social choice and welfare* (ed.) by Kenneth J. Arrow, Amartya K. Sen and Kotaro Suzumura), V. 1:35–94, Elsevier. Surveys
- Chipman, John S., and James C. Moore 1978. "The New Welfare Economics 1939-1974," *International Economic Review*, 19, (3):547-584.
- Coase, Ronald (1937). "The Nature of the Firm". *Economica* (Blackwell Publishing) 4 (16): 386–405
- Coase, Ronald H. 1960. "The Problem of Social Cost". *Journal of Law and Economics* 3 (1): 1–44.
- Fama, E. 1965. "The Behavior of Stock Market Prices." *Journal of Business*, 38:34-105
- Feldman, Allan M. 1987. "Equity," *The New Palgrave: A Dictionary of Economics*, 2: 83–84.
- Hunt, Earl. (Ed.) 2007. *The Mathematics of Behavior*. Cambridge: Cambridge University Press
- Lewis, H. W. 1997. *Why flip a coin? : The art and science of good decisions*. John Wiley and Sons.
- Mishan, E. J. 1980. "The New Welfare Economics: An Alternative View," *International Economic Review*, 21, (3):691-705.
- Sen, A. K. 1979. "Personal utilities and public judgments: or what's wrong with welfare economics?" *The Economic Journal*, 89, 537-558,
- Yu, Ning Neil 2012 A one-shot proof of Arrow's theorem. *Economic Theory*, 50, (2):523-525.