

# THE USE OF THE SQUARE OF OPPOSITION IN ACCOUNTANT'S PROFESSIONAL JUDGEMENT

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## Abstract

This paper reviews the possibility of using the methods of formal logic in the professional judgements taken by accountants, and in accounting regulations as a special type of professional judgements made on behalf of the entire accounting community. It contemplates the possibility and the process of using Michael Psellos's square of oppositions to verify an accountant's professional judgement and correctness of certain regulations. It uses the following examples of judgement verification: asset capitalisation, recognition of property on or off balance sheet, classification of assets as current or non-current. An analysis of the application of the square of oppositions proved its efficiency for verification of professional judgements, primarily the judgements concerning capitalisation of business events and their classification for the purpose of financial statements.

**Keywords:** accounting, logic, square of oppositions, professional judgement.

**JEL code:** M410, M480

*Formal logic is nothing but the study of the properties common to all classifications.*

Henri Poincaré

## Introduction

A professional judgement made by an accountant differs essentially from a simple statement or opinion on an issue. It is the final decision, a verdict passed on a business event. The professional judgement turns a business event into an accounting event presented to the accountant and to other individuals normally referred to as users of financial information. This difference stems from the fact that accountant's interpretation of an event depends not only on the accountant's understanding and the essence of the event itself, but also on external factors, such as accounting theory, laws and regulations. It is therefore crucial that the judgement on an event is appropriate for such event and gives a confident interpretation of the event. If a judgement is required, it means there is a choice of more than one option. Such options are normally mutually exclusive: to capitalise or to write off an asset, to consider a valuation reliable or unreliable, to record net or gross results. By choosing one of the options, accountants often act intuitively, and sometimes cannot give a valid justification for their choice. In such situations, they could use the methods of formal logic to enhance the reliability of accounting decisions. The necessity to use formal logic in accounting theory and practice has been thoroughly reviewed in accounting literature (Riahi-Belkaoui, 2004, p. 133). Reliance on logics has been successfully implemented in professional judgement analyses (Dai, 2010, p. 72). Such methods can also come in handy if you need to verify the decisions made by an accountant during the audit of financial statements or to evaluate accounting regulations. The square of opposition is one of such method.

The square of opposition (Figure 1) was proposed by Michael Psellos (1018 – ca. 1078). It is a diagram representing the relations between simple categorical statements (propositions) about the relations between subject **S** and predicate **P**, which include universal affirmatives “Every **S** is a **P**” (**A** proposition), universal negatives “No **S** are **P**” (**E** proposition), particular affirmatives “Some **S** are **P**” (**I** proposition) and particular negatives “Some **S** are not **P**” (**O** proposition). M. Psellos wrote that knowing whether one proposition in a square of opposition is true or false, we can infer if another proposition is true or false.

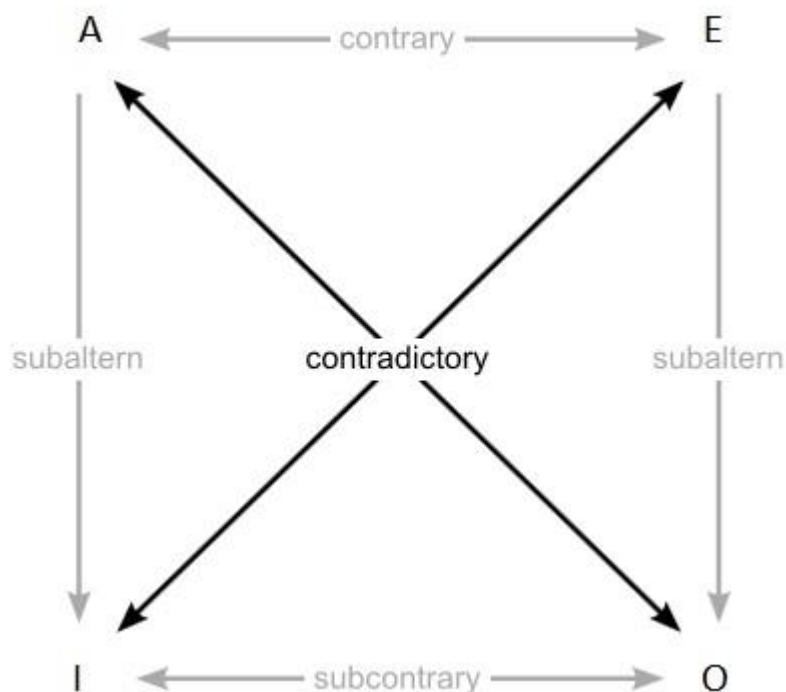


Figure 1. Square of opposition

Particular propositions I and O are subaltern for universal propositions A and E: if A or E is true, then I or O will be true too, but not vice versa. Universal propositions are contrary to each other. They can be both false, but not both true. Particular propositions can be both true, but not both false. A particular proposition that is not subaltern to a universal proposition is contradictory to it (I and E) (O and A), i.e. they cannot be both true or false.

**The square of opposition can be used in accounting** for formal verification of professional judgements made on classification of various items: whether to recognise them on the balance sheet or in the income statement, and in which section. For such purposes, the square of opposition is used to compare the professional judgement in question with its opposite. Let us compare several examples of judgement verification.

*Verifying the judgement on asset capitalisation.* This problem is much broader than an ordinary question whether certain expenses should be included in the value of this or that asset. It involves the accounting relations between two different forms of financial statements: balance sheet and income statement<sup>1</sup>. Accountants make professional judgements in respect of each business event:

<sup>1</sup> Pierre Garnier wrote that the difference between these two forms is one of the reasons why accounting is called a double-entry system [Garnier, 1975, p. 125]

whether to recognise them on the balance sheet (to capitalize) or in the income statement (to decapitalise). The difference between the balance sheet and the income statement is that the latter records the events of the current (reporting) period, while the balance sheet shows deferred events, which refer to future periods<sup>2</sup>.

Let us formulate the categorical statements concerning asset capitalisation. Expenses will mean the exchange of money or real property for notional values (such as deferred expenses [Blatov, 1931]):

- A: Universal affirmative: All expenses are recognised within the assets.
- E. Universal negative: No expenses are recognised within the assets.
- I. Particular affirmative: Some expenses are recognised within the assets.
- O. Particular negative: Some expenses are not recognised within the assets.

In the example above we can infer that since the income statement exists and contains income and expenses, then at least proposition O “Some expenses are not recognised within the assets” is true, therefore, proposition A “All expenses are recognised within the assets” is false (A). The same logic is applicable to the balance sheet. Since it exists, some expenses in it will be recognised within the assets, including both notional and other values, therefore proposition I is true. Thus, if particular propositions are both true, the universal propositions will be both false.

Obviously, this method can be used only to prove the truth of the judgements that were logically inferred from the already proven ones. However, it does not diminish the value of such judgements, since the accountant knows the basic principles from accounting theory, while a logic check may be quite useful for developing accounting treatment principles.

*Verifying judgements on recognising property on or off the balance sheet.* Let us consider for example a judgement in which accounting policies are in conflict with the law. Supposing, an accountant has to choose the right accounting treatment for assets received under a concession agreement. The concession holder may recognise them on or off balance sheet. According to accounting policies<sup>3</sup>, they would be recognised off balance sheet in full compliance with the theoretical concept of standalone business, where the balance sheet reflects only the property owned by the entity. Meanwhile, the law<sup>4</sup> demands that such property be recognised on the concession holder’s balance sheet. Apparently, since the law prevails, the accounting policies should be altered. However, it is true? Let us build a square of opposition.

- A. All the assets not owned by the entity should be recognized on the balance sheet.
- E. No assets that are not owned by the entity should be recognised on the balance sheet.
- I. Some assets that are not owned by the entity (such as concessions) should be recognized on the balance sheet.
- O. Some assets that are not owned by the entity (such as concessions) should not be recognized on the balance sheet.

According to the standalone business principle, proposition E is true. This logically implies that O is true, while I and A are false. Thus, concessions should not be recognised on the balance sheet. Indeed, if concessions were recognised on the balance sheet, they would have to be recognised simultaneously with respective amounts payable, creating a certain sub-balance, i. e.

<sup>2</sup> The fairness of this statement is considered in [Sokolov V. Y., 2011]

<sup>3</sup> Information from the Russian Ministry of Finance as of 24 December 2007 No. PZ-2/2007.

<sup>4</sup> Federal Law On Concession Agreements No. 15-FZ.

an asset, the value of which is constantly changing together with an estimate of respective amounts payable, while sub-balances are not characteristic for ordinary accounting and contradict the usual rules for capitalisation and decapitalisation. Thus, amortisation of such objects would call for simultaneous amortisation of respective amount payable, nullifying their impact on the income statement, while amortisation of amount payable that is regularly recognised within income would not be quite aligned with the law which states that amounts payable could be reduced only by mutual consent of the parties.

According to the law, proposition E is false, since there is at least one example of assets not owned by the entity (concessions) that are recognised on the balance sheet. Therefore, proposition I is true. According to related law (lease) and accounting policies (collateral), proposition O is true, since collateral and rented property are recognised off balance sheet. Therefore, proposition A is false.

A comparison of the theoretical and law-based propositions on recognition of concessions makes it possible to conclude that in any case proposition “Some assets that are not owned by the entity should not be recognized on the balance sheet” will be true, while “All the assets not owned by the entity should be recognized on the balance sheet” will be false, i.e. there may be assets not owned by the entity that cannot be recognised on the balance sheet, and IFRS has a limited tendency to expand the list of such assets. Therefore, adoption of such legal requirement would not only contradict the accounting theory, but also be illogical. Thus, it is not the accounting policies that should be altered, but the law<sup>5</sup>.

*Verifying the judgement on classification of assets as current or non-current.* These judgements have become especially frequent lately due to certain inconsistencies in the wording of accounting rules. Thus, according to item 19 of PBU 4/99, “Financial Statements of an Organisation”, “assets and liabilities on the balance sheet should be classified depending on their maturity (repayment term) into short-term and long-term assets and liabilities. Assets and liabilities are recognised as short-term if their term (maturity) does not exceed 12 months after the balance sheet date or is equal to or shorter than the duration of the operating cycle (if the cycle exceeds 12 months). All other assets and liabilities are treated as long-term.” This statement seems accurate, but the classification of assets into current and non-current (until the end of the 20th century referred to as “main” assets) is replaced here with short-term and long-term, with the terminology applicable to calculations but not to all assets. Unlike calculations, assets are classified into current and non-current not based on their life expectancy, but their role in the production process. In terms of physical existence, all assets are normally long-term, unless they are perishable goods. Meanwhile, current assets are used in the moment, consumed in the process, such as supplies and materials. The consumption speed (or write-off in accounting) is determined by (a) the consumption methods (consumed fully, becoming part of a new

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<sup>5</sup> In this case, it would benefit the public and reduce inflation. Concession agreements have been broadly used in the fuel and energy sector, as replacement for lease agreements. Energy companies obtain rights to infrastructure facilities (primarily heating lines) from state or municipal authorities on the condition that they perform reconstruction of such facilities, and the value of such reconstruction is normally higher than the value of the assets. As a result, energy companies record two items on their balance sheets: reconstruction (respective accounting treatment is the subject of a separate consideration with the help of the square of opposition, since accounting policies would treat reconstruction as an intangible asset) and the restored property, plant and equipment, assessed based on the grantor’s residual value for balance sheet purposes and based on market value for tax purposes. Depreciation and amortisation of the facilities and their reconstruction is included in the regulated tariff. As a result, the energy consumer pays twice, and higher energy costs accelerate inflation.

facility/finished product (materials) or equipment (spare parts) and/or transferred to a new owner (goods), (b) life expectancy (short-life items), and (c) low cost – cheaper items, their long-term tracking being impractical, are treated as materials. Each of these categories can physically exist at the enterprise for more than a year. This is the reason why the approach described above (to divide assets into current and non-current) is sometimes misinterpreted by accountants, and they recognise some inventories within non-current assets, which contradicts their name and the fact that non-current assets are recorded by facilities, and inventories are recorded as stock items by type, while it is physically impossible to account for each individual item. Such “long-term inventories” have erroneously included catalysts, tools, special equipment, protective clothing and a number of other low-value items, and even residues of work in progress due to specifics of the technological process in certain industries, for example metal left in furnaces, plating baths, etc., all based on good intentions, just because such assets are long-lived. Back in the 12th century, Saint Bernard de Clairvaux (1091–1153) warned, “hell is paved with good intentions”. Let us consider this problem using the square of opposition. Let us formulate the categorical statements.

- A. All long-term assets are non-current assets.
- E. No long-term assets are non-current assets.
- I. Some long-term assets are non-current assets.
- O. Some long-term assets are not non-current assets.

Obviously, proposition E is false, therefore, proposition I will be true.

Proposition O is also true, since there will always be current assets remaining at the enterprise for more than one year, for example, goods that have been in stock for a long time, not used, production and mobilisation materials, etc., therefore A is false, and all long-term assets cannot be recorded as non-current assets.

These examples clearly show that the square of opposition is a rather effective tool for classifying business events.

## Summary

As we have demonstrated, the square of opposition can be used to solve both theoretical and purely practical problems, primarily those associated with classifying business events. Methods of formal logic are not only a reliable tool, but also a very convincing way to justify a professional judgement. Its broader application would help to verify accounting rules before their enactment, to create a reliable and efficient regulatory framework. However, there are many more benefits in using logic. Logical methods are only a fraction of the philosophical methods that could be used to drastically improve the accounting theory, primarily in the area of professional judgements.

The next “post-logic” stage should be to study the factors that impact professional judgement using the philosophical square that looks similar to the logical square of opposition (Dubrovsky, 1984). It allows to justify various accounting models identified empirically by describing their peculiarities. In-depth changes in accountant’s apperception also deserve to be a major area in theoretical accounting studies and can bring about new accounting models.

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