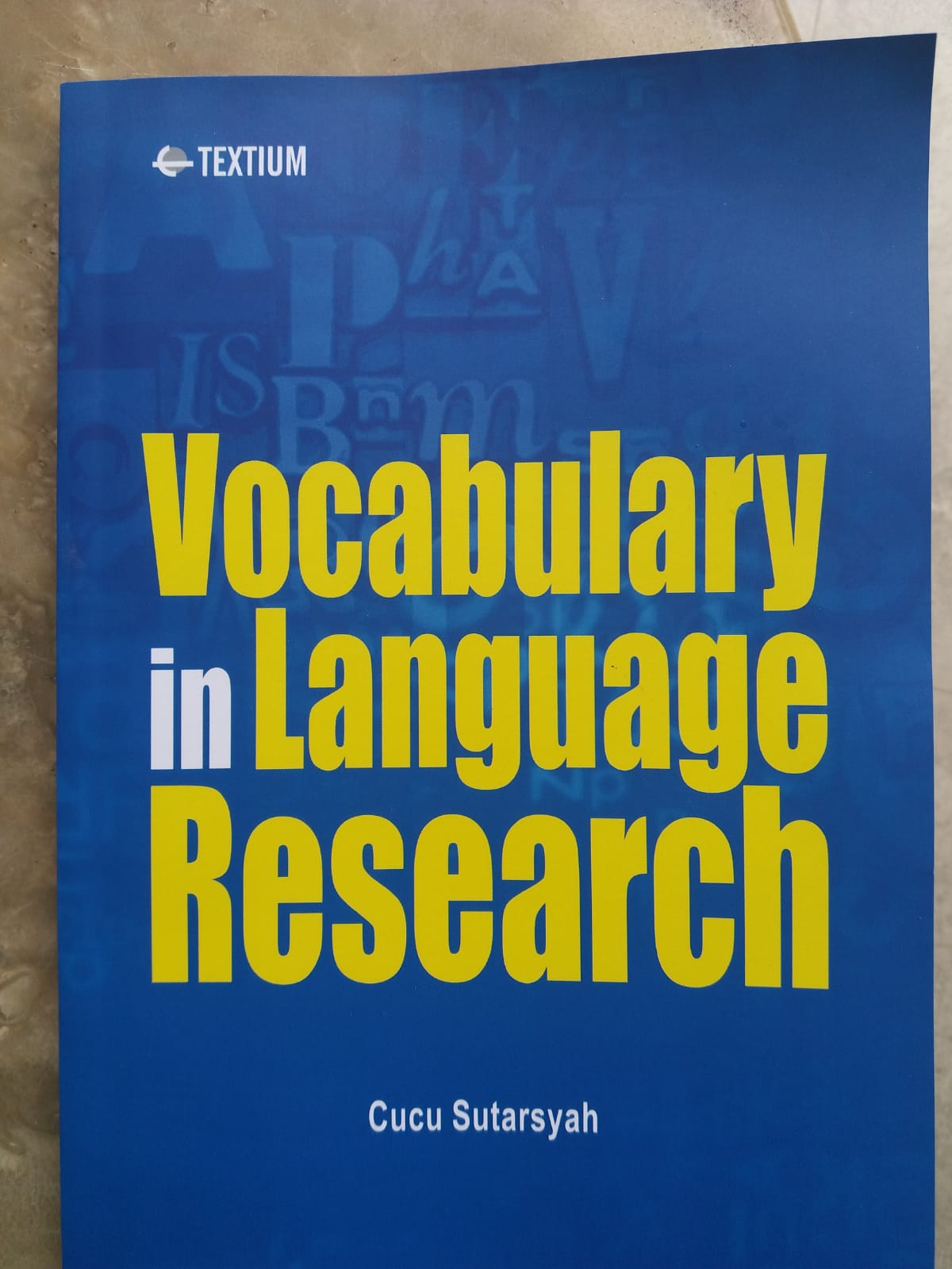
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Vocabulary in Language Research

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CHAPTER I: Introduction

* 1. Overview

The selection of the most important vocabulary is very important in English language teaching. It is generally assumed that random selection of vocabulary is not an efficient approach to teaching. We have to find the minimum number of words that could operate together in constructions capable of entering into the greatest variety of contexts and giving the greatest coverage of texts. This was, in fact, an important aim of the vocabulary control movement which attempted to simplify English for the learner (Jeffery, 1953).

This present study was also carried out based on the idea that there is a need for vocabulary control in language teaching. It looks at the features of words in a text book which is widely used internationally to teach economics and seeks to find the most important words needed in order to read the text book. A text book of economics was chosen to be analyzed because economics is an important area for which English for specific purposes (ESP) has become relatively important. Perhaps, it is not exaggerating to say, as McDonough (1984) claims, that ministries of education in a number of developing countries regard it as one of the keys to their country’s future development as English becomes more widely used in firms and business organizations in multinational relations.

On the other hand, one of the serious problems for ESP teaching in many parts of the world lies in an inadequate supply of English teachers. Many teachers of English as a second language receive no special training in ESP. Moreover, a report notes that most English teachers who have been trained in general English courses are reluctant or feel uneasy to teach ESP (Robinson, 1984). This problem is perhaps due to the fact that teaching English for specific purposes is different in that it needs special attention especially on the vocabulary to be taught which is closely related to the content of the area.

In many non-English speaking countries, like Indonesia, students with various study disciplines need access to educational texts written in English, as such texts contain information and opinion that are of value for both academic and professional purposes. The fact is that the students, as foreign language readers, face many difficulties in struggling to extract meaning from specialist texts. Clearly, a major difficulty is in the specialist vocabulary (Bramki and Williams, 1984, Nation, 2013). This type of vocabulary has, in fact, very low frequency in general English usage, but it has a reasonably high occurrence in its field. A word may be of relatively rare occurrence in the total use of English but be absolutely essential for, say, economists who wish to read learned articles on their specialization (Wallace, 1982). It is obvious that for a beginning teacher or student of ESP, such vocabulary becomes a great problem to deal with. At the same time, the crucial thing to do for a teacher, or perhaps a learner as well, is to find out the most important vocabulary that will be used to read books in that field. This is obviously important because random selection of vocabulary, as previously stated, is a wasteful approach to learning a language.

* 1. The Need for Empirical Study of the Vocabulary of Economics

Research in vocabulary has been done by some people (Schmitt, 2010, McCarthy, at al., 2010, Read, 2004). As previously mentioned, ESP teaching plays an important role in many countries. In Indonesia, for instance, many teachers have been trying to improve the quality of teaching and seek some effective ways to get a better result. In terms of vocabulary teaching and learning in ESP, the learners, in some cases, do not know which words are more important than the others in a particular field, say, economics. This happens because there is not enough information about the particular words they have to learn based on valid research on word selection.

Text analysis for the purpose of classroom teaching is relatively limited in Indonesia. Some teachers of English are still unaware of the value of having their text books analyzed for their teaching (Nation, 2008). They just use them without any flexibility. This situation may lead to inefficient teaching. Text book analysis here means the analysis of language in use. It cannot be restricted to the description of linguistic forms independent of the purpose or function which those forms are designed to serve in human affairs (Brown and Yule, 1983). This involves studying the relationship between language and contexts in which it is used (McCarthy, 1991).

This present study attempts to investigate economics vocabulary by analyzing a widely used economics text book, Parkin’s *Microeconomics*, in terms of the vocabulary used. The study is based on computer corpus analysis including word frequency counts. There has been very little research similar to this where vocabulary in a text is analyzed and identified for the purpose of ESP teaching.

In order to see how the vocabulary of economics compares with general academic vocabulary, the vocabulary in the economics text book was also compared with that in the academic sections of the Lancaster-Oslo-Bergen (LOB) corpus and the Wellington (VUW) corpus.

* 1. Focus of The Study

This study is focused on the following main areas, namely:

1. A description of the word frequency patterns of the whole economics text.
2. Discussion of the features of vocabulary of economics that are likely to be useful for learners.
   1. Aims

This research was aimed at finding general features of the vocabulary of economics, especially in Parkin’s *Microeconomics* as compared to the vocabulary in general academic English. By this analysis of the vocabulary, it is hoped that particular words that will be needed by the learners of English as a second language studying economics can be found.

CHAPTER II: Literature Review

This chapter discusses some previous studies and articles to provide a theoretical basis for the research conducted in this study. It specifically reviews:

1. The type of linguistic databases needed for corpus study in word counts
2. Vocabulary counts
3. The analysis of word frequency counts on academic English
4. Collocations
5. The language of economics (ESP) and general academic English (EAP)
6. 1. The Linguistic Databases

Word counts are dependent on a large amount of data usually in the form of computer corpora. Greenbaum (1984) argues that corpus studies have an obvious attraction especially for linguists who are not native speakers of the language. By limiting their description to an analysis of the features present in the corpus, non-native linguists can be confident that their language material is reliable.

Word frequency counts of a corpus can be used as a basis for selecting vocabulary for the teaching of English for Specific Purposes (ESP), or English for Academic Purposes (EAP). Greenbaum further explain that ‘a corpus may also be used for frequency counts to suggest relative frequencies for a set of linguistic features in the language and to study stylistic variation of the language as well so that it can represent language in actual use’ (Greenbaum, 1984: 193).

* 1. Vocabulary Counts

This part discusses why a vocabulary count is important especially for teaching and learning academic English and general English as well. Many word frequency counts and word lists especially by using a computer have been done previously’ One of the studies was done by Sutarsyah, et al. (2018). These basic techniques for processing texts by computer were developed some years ago in the investigation of vocabulary patterns (Jones an Sinclair, 1974). However, long before this, without the use of a computer, Thorndike and Lorge (1944) studied word frequency in a corpus from general reading, text books, the bible, and recent and popular magazines. Michael West’s General Service List of English Words (1953) which is partly derived from Thorndike and Lorge’s work became the standard for determining high- and low-frequency words for the purpose of teaching and learning English as a second or foreign language.

Some studies of word frequency were based on an assumption that learners should have a minimum learning burden with maximum learning outcome. Learning a language does not necessitate learning all the items in the system (Richards, 1974). It is also stated that this word selection is of benefit for simplification of teaching as opposed to the simplification of English language. Further, West (1953), when introducing his list, explained that ‘the chief values of the list are that it shows: (1) how heavy is the learning burden of the major words compared with all others, and how very much the learner’s task may be lightened by cutting out everything which is not really essential, especially in those heavy words; (2) how much less frequent and less important are minor items of words than one would have expected. Indeed, it may be taken as a general rule that anything which seems in the least degree unusual or doubtful should certainly be excluded from the teaching course’ (West, 1953: viii).

A more recent word frequency count is the study done by Kucera and Francis (1967) (see also Francis and Kucera, 1982). This study reports an analysis of 1,014,232 words of natural language taken from different materials printed in the United States in the same year. The corpus consists of 500 samples of approximately 2,000 words each which were selected to be representative of current printed American English (Kucera and Francis, 1967: xviii-xix). The study presents the rank list of words and alphabetical frequency lists which are very useful for seeing how more or less important the words are.

Another word count using a corpus done by Carroll, Davies, and Richman (1971) is called the American Heritage Intermediate (AHI) Corpus. The AHI corpus is a computer-assembled selection of 5,088,721 running words drawn in 500-word samples from 1,045 published materials (texts) including textbooks, workbooks, kits, novels, poetry, general nonfiction, encyclopedias, and magazines that might be read by students in grades 3 through 9. It contains 86,741 different words (word-types). The word count gives information about the frequency and range of words over 17 different subject categories (coded A through S). It is very useful in making lists of vocabulary for special subject areas.

* 1. Vocabulary Analysis and Word Frequency Counts of Academic English

There have been several analyses of vocabulary and frequency counts of academic English, most of them on a small scale. Dudley-Evans and Henderson (1990) provide many examples especially on economics discourse. One of the interesting pieces of research on economics discourse using a computer corpus, particularly on collocation, was done by Henderson and Hewings (1990). They analyzed the terms used in economics texts through recurrent features of the words in the corpus. They studied the collocations according to the right or the left context of sentences from the corpus.

Bramki and Williams (1984) investigated how economics texts help learners to understand the meaning of unknown words or terms through lexical familiarization. Based on the analysis of a specified corpus, they divided familiarization devices into six categories: exemplification, explanation, definition, stipulation, synonym, non-verbal illustration. Their work on these six categories is completed by frequency data provided for each type of familiarization.

Mead and Henderson (1983) analyzed how conditional form and meaning are used in an economics text. It was found that there were four specific categories in which conditional forms were expressed by using ‘if’.

* 1. Collocation

In the previous section, it has been mentioned that a word is learned in relation to other words in a text. It was also argued that a word was best learned from its context. All these show that it is important to learn various lexical combinations that occur in sentences.

There are several major variations of lexical combination that can be identified. Each of which exhibits varying degrees of cohesiveness: **free combinations**, **idioms**, **collocations**, **transitional combinations**, and **compounds**.This study does not deal with all kinds of combination in detail but it investigates collocations of a few words selected from the overlap of both corpora, Parkin’s *Microeconomics* and general academic English. This was done to see if the words behaved in the same way in economics text and in general academic English.

* + 1. What is Collocation?

We have briefly discussed the nature of learning vocabulary through collocation. Collocation is defined as the co-occurrence of words in a text. The term ‘collocation’ is generally used in discussing the nature of lexis and its relation to grammar (Butler, 1985). Even though lexis is usually contrasted with grammar, they sometimes have a close relationship with each other.

A word is meaningful whenever it is seen in connection with other words in a text. Certain words occur together significantly. This co-occurrence is called collocation. Take, for example, the phrase ‘low price’ which is used so frequently in an economics text that it springs readily to mind; it is psychologically salient as a fixed phrase in English. Thus, we call it a **fixed combination**, **recurrent combination** or **collocation** (Benson et al., 1986).*Thank* collocates with *you* as in *thank you*. The word *lean* collocates significantly with the word *meat* (Carter, 1987). ‘A significant collocation is one in which the two items co-occur more frequently and regularly than could be predicted on the basis of their respective frequency and the length of the text under consideration’ (Jones and Sinclair, 1974; Martin et al., 1983: 84). The word *thank*, in the above example, occurs with the word *you* more frequently than, for example, the word *her* or *him* as in *thank her* or *thank him*. Therefore, the latter is not considered a collocation.

Several collocational patterns occur as fixed combinations. The items may co-occur simply because the combination reflects a common real world state of affairs (Gairns and Redman, 1986). For example, *pass* and *salt* collocate significantly as in ‘Please pass the salt!’, because people often want other people to pass them salt. The following is an example of some fixed combinations in collocation:

* *cats and dogs*: as in *It’s raining cats and dogs*, but not *dogs and cats*;
* *after all*, but not *before all*;
* *mother tongue*, but not *father tongue*; etc.

The examples above indicate that the words with their company are linked together quite closely. The words in these fixed pairs sometimes have a different meaning from their individual meaning. We can notice the word *of* and *course* as in *of course* have their own individual meaning. The word *of* and *course* in this context are different from the word*of* and *course* in other contexts, such as *instead of*, *way of life*, *an English course*, *course work*, etc.

Trimble (1985) considers that noun compounds are a major source of difficulty. Noun compounds can be defined as ‘two or more nouns plus necessary adjectives (and less often verbs and adverbs) that together make up a single concept; that is, the total expresses a “single noun” idea (Trimble, 1985: 130 – 131). In economics text, many noun compounds are found such as *maturity structure*, *net present value*, *price-earning ratio*, and so on. These collocations may be a major source of difficulty and for this reason these compounds deserve special attention.

The terms **node**, **collocate**, and **span** will often be used in this discussion. ‘A node is the lexical item whose collocational pattern is being investigated. A collocate is any lexical item which co-occurs with the node within specified co-text. A span is the context within which the collocates are said to occur. Span positions of collocates are numbered according to their distance from the node’ (Martin et al., 1983: 84). The word *low*, as in *low price*, is a word whose collocational pattern is being investigated; and *price* is a word that co-occurs with the node and is therefore called a collocate. In this case, the collocate *price* occurs at span position N+1 of the node *low*.

However, node and collocate can alternatively be used depending on what word is being investigated and what word is appearing as a co-occurrence of the word. If, for instance, we investigate the collocational pattern of the word *price* and notice that the word *low* co-occurs significantly with it, then *price* is the node and *low* is the collocate with span position of N-1.

* 1. English for Economics (ESP) and English for Academic Purposes (EAP)

English for economicsis one of the disciplines in English for specific purposes (ESP) or more narrowly English for Academic Purposes (EAP). Ideally English is taught based on the learners’ basic needs for using English. Widdowson (1981) claims that the work that has been done in teaching ESP has generally been based on the following assumption: if a group of English learners’ needs can be accurately specified, then the specification can be used to determine the content of language program that will meet these needs. The implication of this assumption is that the specification should be made when teaching English to students of different study backgrounds. Thus, we can specify what students of economics need to be able to do with English by analyzing their text books. ‘The process of deciding what to teach is based on consideration of what learners should most usefully be able to communicate in English. When this is established, we can decide what are the most appropriate forms for each type of communication’ (Wilkins, 1976: 19).

* + 1. The Language of Economics

Since the research deals with the vocabulary of economics in a text book, describing the type of economics language seems reasonably important. The idea underlying the analysis of the language of an economics text book is based on the following notion.

What can we say about economics and economics text on the basis of understanding of language and language use as revealed in the text considered? The aim is not to help English language experts become economists, nor is it to help economists become language experts. Rather it is to enable language experts and subject experts to consider the nature of economics writing and language use both at the level of the sentence and beyond in ways that tell us how economics text works (Henderson and Dudley-Evans, 1990).

One of the features of economicswriting is the tendency of the writers on economics to move between the real world and a hypothetical or idealized world. In order to develop theories and models an economics researcher has to move from reality to unreality.

Students become alienated from the study of economics theory because they feel that the assumptions of economics are unrealistic (and as a result, that the theory cannot be used for the information of economics and social policy in which many of them are interested); because they feel that the distinction between positive and normative questions is unreal and perhaps even ‘immoral’; because they find the insistence on the prediction of human behavior both grandiose and vaguely menacing (Papps and Henderson, 1977: iii-iv).

Economists test their hypotheses in an ideal world where they can control all influences and judge how they affect each other. Then they apply their findings to the real world. This results in shifts within texts between the ideal world and reality (Hewings, 1990). Later in this study we will see how this shift between theory and example results in some unusual occurrences of high-frequency items.

* + 1. English for Academic Purposes

General academic English in this research refers to English for Academic Purposes (EAP) and refers to the English used in a range of academic text books for university students. It may include many areas from different disciplines, such as geography, mathematics, economics, and so on. EAP makes extensive use of authentic materials from text books for academic purposes (Hewings, 1990). In some cases, EAP is identical with English for Science and Technology (EST). Sometimes there is a distinction between EAP itself and English for Occupational Purposes (EOP).

* + 1. Lexical Items in EAP

In general English vocabulary, words are usually classified into high and low frequency. The high-frequency words are typically small in number but occur very frequently in a wide range of texts. The low-frequency words are many in number and occur infrequently with a narrow range. For general purposes the words in the first 2,000 words of General Service List of English Words, called GSL (West, 1953), are considered as high-frequency words. All other words are considered as low-frequency words.

In EAP, low-frequency words in general English may have a very high frequency in a specialized field, along with a special meaning. These may be termed technical vocabulary, although as we shall see later in this study, this group of words is not easy to define. Some researchers have shown that technical words do not usually cause great difficulty for second language learners (Ghadessy, 1979).

The problem for second language learners, according to Trimble (1985), lies in learning sub-technical vocabulary. Sub-technical vocabulary can be defined as context independent words which occur with high frequency across disciplines. This refers to those words that have one or more general English meanings and which in a technical context take on extended meanings.

It is assumed that university students are already familiar with the general-service vocabulary since they have learned English for several years. However, they are likely to need words common to the academic texts used in universities. Based on this assumption Xue and Nation (1984) compiled a list of words called the University Word List—the vocabulary of university study. The list covered a range of disciplines from four different sources. It includes 737 word families. It assumes the knowledge of West’s General Service List of English Words (1953) and builds on that. The list was compiled from two main sources. The first is from An Academic Vocabulary List by Campion and Elley (1971) and the second is from the American University Word List (Praninskas, 1972). The other sources were the Lynn (1973) and Ghadessy (1979) word lists. This University Word List is very useful for university students and is used in university language programs for non-native students. It typically provides coverage of over 8% of the running words of academic text, and 4% of the running words in newspapers (Hwang, 1987). This list is used in this study of economics and general academic texts.

CHAPTER III: Methodology

This chapter describes the process of data preparation and data gathering including the process of making word families, devising the eight levels of overlap, and making word lists. The computer analysis and the types of computer programs are also discussed in this part.

1. 1. The Selection of Texts for Analysis

To investigate the features of words and language use in a particular field needs a large amount of data. A computerized corpus can provide such data. As previously mentioned, this study deals with identifying the features of the vocabulary of economics and investigates the uniqueness of this vocabulary in comparison with other fields. Therefore, two corpora, economics and general academic, were compared in this study.

This study had to decide which particular corpora would be used. After some consideration, a widely used introduction to economics which is used as a textbook in many universities was chosen. It was *Microeconomics* by Michael Parkin. A corpus of a similar size from general academic vocabulary was made by selecting section J (written academic English) from the Lancaster-Oslo-Bergen (LOB) corpus and the Wellington corpus (VUW). The selection of section J, learned and scientific writing, was done to provide a sample of a wide range of the vocabulary of academic English.

* + 1. Parkin’s *Microeconomics*

The primary data of this research was taken from Parkin’s *Microeconomics*. This text is hereafter referred to as **Ecocorp**, which stands for ‘economics corpus’. For this purpose, permission to use and scan the words from the book into a computer was gained from the publisher (see Appendix 1). The book is widely used and its writer is well respected in the field.The book is used by many first-year university students, as the main reading source in economics. It was prepared to meet the needs of students whose major is economics and those who want an introduction to economics. Ecocorp contains 295294 running words.

Looking at the author’s experience as well as the content and organization and purpose of the book, it seemed that it was representative enough to be claimed as a sample of economics language and that it was suitable to use in this research.

* + 1. The LOB Corpus

The Lancaster-Oslo-Bergen (LOB) corpus is a large computer-based standard corpus of written British English. It contains 500 samples of printed texts published in 1961. The 500 samples each contains about 2,000 words, and the whole corpus is about one million running words in all, taken from fifteen different genres. It was compiled at the Universities of Lancaster, Oslo and Bergen between 1970 and 1978 (see Johanson et al., 1978).The LOB corpus is a counterpart of the Brown Corpus of Present-Day American English, comprising the same number of samples (500) taken from the same number (15) and the same types of genres.

For the purpose of this study only section J of the corpus was taken as a database. It contains learned and scientific writing which consists of 80 samples of about 160,000 running words as follows:

Figure 3.1 The number of samples in section J of LOB corpus

|  |  |  |
| --- | --- | --- |
| No. | Subject | Samples |
| 1 | Natural sciences | 12 |
| 2 | Medicine | 5 |
| 3 | Mathematics | 4 |
| 4 | Social sciences | 14 |
| 5 | Political sciences, law, education | 15 |
| 6 | Humanities | 18 |
| 7 | Technology and engineering | 12 |

* + 1. The VUW Corpus

The Wellington Corpus (VUW) is another corpus exactly parallel in structure and size to both the LOB and Brown corpora. It was compiled in 1990 by the Linguistics Department at the Victoria University of Wellington. Section J of the LOB corpus was combined with section J of the VUW corpus. It was assumed that this combined data could represent general academic English to compare with the more specialized academic English of economics. The combination of section J of the LOB and VUW corpora formed a corpus of general academic English called **Acacorp** (General Academic English Corpus) which is similar in size to Ecocorp. Acacorp consists of 311768 running words, compared to the 295294 of Ecocorp.

* 1. Data Preparation

This section deals with the process of data preparation beginning from transferring the data from the book into the computer for word processing to become computer readable data. The other data from the LOB and VUW corpora were already available in computerized form and required only minor editing. The process of preparing the data for analysis was done on the following three steps: **scanning**, **editing**, and **computer programming**.

Basically, the book consists of 8 parts with 23 chapters (not 11 parts with 38 chapters as stated in the book) spread over 638 pages including a preface, the text, and a glossary. The scanning was a difficult and laborious task. Manual input was also required as well as careful checking and rechecking.

* + 1. Editing

Editing was done to ensure that all sentences and paragraphs matched those in the book. When the files were in the computer, the next step was to edit the files, removing all errors introduced by scanning and the original printed layout of the text. For example, hyphenated words, at line end and page breaks in the written text, had to be joined.

As previously mentioned, the computer, when scanning, could not read the text exactly the same as that in the book. There were some changes in the formation of words and sentences. It often happened that a good, meaningful word arrangement could become completely different from the original one. This mostly happened when there was a table, figure or sometimes mathematical expression where a group of words was arranged in a number of columns. The computer, in this case, read them horizontally across the columns. See the following example:

Figure 3.2 Text sample taken from Parkin’s Microeconomics (p. 79)

|  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- |
| Original technology | | | New technology | | |
|  | Price (dollars per tape) | Quantity (millions of tapes per week) |  | Price (dollars per tape) | Quantity (millions of tapes per week) |
| a | 1 | 0 | a' | 1 | 3 |
| b | 2 | 3 | b' | 2 | 6 |

* + - 1. Spelling Check

This is an important part of the editing process. After other adjustments had been made, the next step was to have a spelling check by using the WordPerfect Spelling Check. For this purpose, the British spelling check was used in both corpora. Because Ecocorp uses American spelling a lot of words were changed into the British English spelling. For example:

|  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- |
| labor | - | labour | sulfur | - | Sulphur |
| behavior | - | behaviour | fiber | - | Fibre |
| center | - | centre | snorkeling | - | Snorkeling |
| gray | - | grey | ceilling | - | ceiling |
| inessential | - | unessential | fueled | - | fuelled |

* + - 1. Hyphenation

A hyphen is the only punctuation mark given special consideration. Some of them were ignored and not included in the data; some others were included because of their function and position in the sentences. Hyphens were kept in compound words as in the following cases:

*day-to-day business profit-maximizing output*

*long-run cost self-appointed experts*

*man-made chemicals short-run demand*

*owner-operated firms*

As hyphens were regarded as letters, these hyphenated constructions were counted as single words, so *single-price* was counted as one word.

* + 1. Editing General Academic Texts

It is necessary to describe the data preparation of the academic corpus as well. Although the text, unlike the data from Ecocorp, was basically ready to use, some editing needed to be done. The major problem is that both corpora use the letter ‘J’, referring to section J, followed by numbers to represent the subsections, for example J01 01, J01 02, J01 03, J01 04, etc. These characters appear as the single letter ‘J’ with a very high frequency, therefore this letter as a single item was deleted from the text.

Another problem is that there are some words which are a part of the format tagging of the LOB and VUW corpora. These words are not considered as part of the text, and were all deleted. For example:

FORMULA

TABLE

BEGIN INDENTATION TWO

END INDENTATION TWO

END INDENTATION ONE

etc.

* 1. Computer Software which was Used for Analyzing the Corpora

The computer programs are called OCP and FVORDS. The information about the functions of these programs used in this research is briefly given below.

* + 1. OCP

OCP (The Oxford Concordance Program) is a general purpose computer program that can be used to make concordances, indexes, and word lists from texts in a variety of languages and alphabets. It can also be used for many text analysis applications, for investigation of style, grammatical forms, vocabulary distribution, etc. (see Hockey and Martin, 1988). This program is very easy to operate with very simple instructions for inexperienced computer users.

OCP was used, in this research, to make frequency-ranked word lists and alphabetical lists. These lists show the number of running words in a text and the number of different words occurring in a text along with their frequency of occurrence. OCP can also be used to find collocations.

* + 1. FVORDS

Another program used to help analyze the data is FVORDS. This computer program was devised by Hwang Kyongho and Paul Nation (English Language Institute, Victoria University of Wellington, New Zealand) and programmed by Alex Heatley (Computing Services Centre, Victoria University of Wellington, New Zealand).

FVORDS compares all the word-forms in an input text with three base-word lists. It lists and counts the forms in the text according to what base-word list they are in, in addition to listing those words that are not in any base-word list. It also creates output lists according to forms and word families along with their frequency of occurrence of each item. In addition, it tabulates the proportion of the text covered by each list and by the words not in any list.

This program can also be used to help to make a lemmatized word list or a word-family list from a text. Lemmatization is the process by which word-forms occurring in text are linked with the paradigms to which they belong (Martin et al., 1983). So for example, conjugated verb forms are grouped together with the infinitive form, e.g. *tries*, *tried*, *trying*, are grouped under one word heading, *try*; noun inflections are grouped with the singular of the noun, e.g. *books* with *book*.

It is often the case that some words from the same word family, as found in the Ecocorp word list, have different frequencies. For example, the words *price*, *prices*, *priced*, and *pricing* have frequencies of 2565, 1, 484, and 30. In fact, these four word-forms if they are combined have a very high frequency, 3080. FVORDS combines these figures for words in the base-word lists.

FVORDS can also be used to compare a vocabulary list against a text to see what words in the text are and are not in the lists and to see what percentage of the items in the text are covered by the lists. In other words, FVORDS classifies the words in the text into several categories based on three base-word lists provided in FVORDS. These three word lists are called BASEWRD1.DAT, BASEWRD2.DAT and BASEWRD3.DAT. The words in the text belonging to these lists will be grouped according to these three lists and those not in any of these lists will be grouped in a list called ‘the words not in any list’. Detailed information about those three base-word lists and the process of forming word families are discussed in the next section.

* 1. Defining a Word

As the main purpose of this study is investigating the features of words used in an economics text, it is inevitably important to establish what is meant by the term ‘word’ (or word family) in order to have a valid basis for making word counts.

Many researchers have defined a ‘word’ differently for different purposes. A word can be simply defined as a written or printed symbol as a unit of a language. Many definitions of the concept of a ‘word’ remain blurred. Are the items *interest*, *interests*, *interested*, *interesting*, and *interestingly* considered as one word or several? Another vagueness can be seen in the following phenomenon, as described by Lamb (1969). *Table* has two quite different meanings, as in *a book is on the table* and *a table is in the book*; are these two words—*table* 1 (a piece of furniture) and *table* 2 (a display of information)—or just one word? This phenomenon can be clarified by distinguishing the terms **morphological word**, **lexical word**, and **semantic word** (Lamb, 1969). *Table* and *tables* are two different morphological words but they are two forms of the same lexical word. *Table* 1, as in *a book is on the table* and *table* 2, as in *a table is in the book*, are two different semantic words corresponding to a single lexical word (Lamb, 1969). They are homographs. They have the same form but quite different meanings. Knowing one meaning of *table* does not mean that minimal effort is needed to learn the other, so they would be regarded as two base words. This study does not differentiate between the meaning of these two words, as in *table* 1 and *table* 2. The word lists treat these two words as the same one word-form.

Another conventional view is that the term *word* denotes a single unit of language comprising base-forms, such as *take* and its associated set of inflexions, such as *takes*, *took*, *taken*, and *taking*. This concept of a word is an established one in computational linguistics where all inflected forms, including the base-form, can be subsumed under the term ‘lemma’ (Sinclair and Renouf, 1988).

This study used the following definitions of word. Firstly, to determine the size of a text or the number of running words in a text, any single occurrence of a word-form will be counted as one occurrence. So, *leave*, *leave*, *leaves*, *leaving* and *left* make up five occurrences or tokens. Capitalization was ignored. In addition, a word including a hyphen was considered as one word such as *after-tax*, *anti-free*, *anti-missile*, *by-product*, *car-making*, *long-run*, *short-run*, *six-pack*, *least-cost*, *single-price*, etc. The same criterion was also used in compound words, like *household*, *householder*, *haircut*, *outcome*, *pioneer land*, *stockholder*, etc. Each of these words was counted as one word in the lists. A word with an apostrophe was considered two separate words and they were changed to their original forms, e.g. *they’re* became *they are*, and *won’t* became *will not* (see data editing in section 3.2.2.6). This was done in text editing in order to find the exact number of words like *are*, *is*, *was*, *has*, *have*, *us*, *not*, etc.

Secondly, to find the number of words in the texts, the simple notion of ‘word-form’ was applied so word counts were made based on how many different words occurred in the texts, regardless of capital letters. Thus, *leave*, *leave*, *leaves*, *leaving*, and *left* are considered four different word-forms. However, the frequency of occurrence of each word-form is counted; in this case the word-form *leave* has two occurrences. This is used to find the density index of the texts which is the ratio of the total of word-forms to the total of the running words.

The last concept applied is that word counts can be based on **lemmas**. Because traditionally lemmas include only base and inflected forms, a group of inflected and derived words was counted as one word family. In most parts of this thesis, especially the beginning of Chapter IV, word family is often used. What can be included in a word family is described in the next section.

* 1. Lemmatization

In part 3.3.2, we have discussed the function of the computer program called FVORDS. This program can be used to put the words in a text into word families.

Nagy and Herman (1987: 20) explain that:

A word family consists of the set of words for which there is a transparent, predictable relationship in both form and meaning. For example, *persecute*, *persecution*, and *persecutor* would all be considered as constituting a single word family, along with regular inflections such as *persecuted* and *persecutions*. On the other hand, *busy* and *business* would be counted as belonging to two separate families, because the latter word has a meaning that is not predictable from the meaning of the former.

Bauer and Nation (in press) claimed that ‘decisions about what is included in a word family are important because they have significant effects on vocabulary size research, and learning goals and teaching procedures’.

The basic criteria for determining word families vary greatly. Nagy and Anderson (1984) divided semantic relatedness into six levels, termed SEM 0 to SEM 6. The following is a summary of the six levels (pp. 310 – 312):

SEM 0. The semantic relationship between the target word and immediate ancestor is semantically transparent. In this level the target word is easily recognized. If a learner, for example, knows the word *quick*, he or she can easily predict the meaning of the derived word *quickly*.

SEM 1. The meaning of the target item can be inferred from the meaning of its immediate ancestor with minimal help from context. For example, the suffix *-er* in the word *hunter* indicates a person who hunts, etc.

SEM 2. This level is a bit higher than SEM 1. The meaning of the word can be predicted with reasonable help from context. And it needs general contextual information to be inferred. For example, the word *knowledge* from its ancestor *know*.

SEM 3. The meaning of the target item includes semantic features that are not inferable from the meaning of the ancestor without substantial help from the context, for example the word *showroom* from *room*.

SEM 4. The meaning of the target word is related to the meaning of its immediate ancestor, but only distantly. For example, pairs of words with this degree of semantic relatedness are *farewell*/*well*, *vicious*/*vice*, *motley*/*mottle*, etc.

SEM 5. There is no discernible semantic connection; the meaning of the immediate ancestor is of no use in learning or remembering the meaning of the target word. Examples of such a relationship are *clerical*/*cleric*, *groovy*/*groove*, etc.

Among those six levels, Nagy and Anderson regarded SEM 0 – SEM 2 as being semantically transparent, while SEM 3 – SEM 5 are semantically opaque.

On the other hand, Bauer and Nation (in press) divided the word building devices of English into seven levels which are based on affixation procedures and are ranked with the following criteria.

1. The affixes occur very frequently.
2. They are highly productive.
3. Their meaning is predictable.
4. The removal of the affix will leave the base orthographically intact and recognizable.
5. The removal of the affix will leave the base phonologically intact and recognizable.
6. The affix has a constant orthographic form.
7. The affix has a predictable phonological form.
8. The affix is functionally regular.

It should be noted that phonological criteria are always ranked after orthographic criteria in the decision of the levels. The decision is made based on ‘the assumption that the processes recommended here are aimed at allowing comprehension of written rather than spoken texts’ (Bauer and Nation, in press). The following is a brief description of the seven levels. A summary of the levels with their affixation criteria is provided in Appendix 4.

Level 1: Each form is a different word. At this level every word-form encountered is treated as a separate item for learning purposes. For example, the words *sign* and *signs* in the following sentences are considered as different words: *I read the sign* and *He signs to me to stop*.

Level 2: Inflectional suffixes. Words with the same base and inflections are considered as members of the same word family. The inflections include plural, third-person singular, present tense, past participle, *–ing*, comparative, superlative, possessive.

Level 3: The most frequent and regular derivational affixes. At this level, the eight criteria are applied to derivational morphology.

Level 4: Frequent, orthographically regular affixes. At this level, orthographic criteria are taken to be more important than phonological criteria. An affix which is widely generalized is taken to be more important than whether it is productive or not.

Level 5: Regular but infrequent affixes. The affixes here are not widely generalized but their behavior is fairly regular.

Level 6: Frequent but irregular affixes. This level includes those affixes which provide major problems of segmentation either because they cause gross allomorph in their bases or because there are major problems involved in segmenting them caused by homography.

Level 7: Classical roots and affixes. This level includes all the classical roots which abound in English words and which occur not only as bound roots in English but also as elements in neo-classical compounds (such as *photography*).

It was assumed for the present research that a learner at university level would be able to recognize derivational affixation of level 1 up to level 4. This decision was used as a basis for revising the base-word lists used with FVORDS. Based on this decision, the root *relate*, for example, with its derived words, was divided into several word families as follows:

Figure 3.3 Example of word family grouping

RELATE

RELATED

RELATEDNESS

RELATES

RELATING

UNRELATED

RELATION

RELATIONS

RELATIONSHIP

RELATIVE

RELATIVELY

RELATIVITY

* 1. Base-Word Lists

As previously mentioned, the FVORDS program needs three base-word lists. These three lists contain word families with their head words. They are arranged in such a way that the computer can read and compare them with the input text, so that the output file will appear with both form-based and word-family-based word lists with their frequency of occurrence. The computer also shows the proportion of tokens and word families. The term ‘token’ refers to a single occurrence of a word in a text. ‘A token is any individual word identified in any specified selection from the corpus or in the corpus as a whole. The number of tokens is thus synonymous with the number of running words’ (Kucera and Francis, 1967: 294).The criteria to determine which words belong to a word family are based on levels 1 – 4 of Bauer and Nation (in press). Both American and British spellings were used in devising the three base-word lists.

Figure 3.4 Example of word families in base-word list one

A

AN

ABLE

UNABLE

ABLY

ABLEST

ABLER

ABILITY

ABOUT

ABOVE

ACCEPT

ACCEPTS

ACCEPTING

ACCEPTED

ACCEPTANCE

ACCEPTABLE

ACCEPTABILITY

Figure 3.4 shows five head words: *a*, *able*, *about*, *above*, and *accept*. The articles *a* and *an* will be counted as members of one word family. The head word *able* has six family members which are also counted as one word family. *About* and *above* have only one member; *accept* has seven members.

* + 1. Base-Word Lists One and Two

The words in base-word lists one and two were originally taken from *A General Service List of English Words* (West, 1953), called GSL for short. The words represent ‘a list of 2,000 general-service words considered suitable as the basis of vocabulary for learning English as a second language’ (West, 1953: vii).

Base-word list one includes the most frequent 1,000 words of English. The size of this word list is 4189 word-forms consisting of 1181 word families. Base-word list two includes approximately the second 1,000 most frequent words. This includes 3245 word-forms with 956 word families. The two base-word lists contain a total of 2137 word families.

The criterion used to decide whether words were put in base-word list one or two was based on their frequency. Base-word list one consists of the words with a frequency of 332 or more occurrences per five million running words in the GSL, plus months, days of the week, numbers, titles (*Mr*, *Mrs*, *Miss*, *Ms*, *Mister*) and frequent greetings (*Hi*, *Hello*, etc.). Words with a frequency of 331 or less per five million running words in the GSL were put in the second 1,000 words, base-word list two (Hwang, 1987).

* + 1. Base-Word List Three

Base-word list three consists of words not in the most frequent 2,000 words of GSL, but which are frequent in university texts from a wide range of disciplines. The words were originally from the University Word List by Xue and Nation (1984). This word list consists of 3841 word-forms with 831 word families.

CHAPTER IV | Result and Analysis

This chapter presents the analysis of the data. It identifies the main characteristics of the words in Ecocorp as compared with those in Acacorp. These include the following areas:

1. identifying the features of the corpora;
2. the description of high-frequency words in the economics text compared with general academic English;
3. the description of overlapping words from the first 1,000 words;
4. identifying low-frequency words in the economics text that occur in the first 2,000 words of GSL (West, 1953); and
5. the description of the patterns of the overlapping words in the economics text and general academic text.


9. 1. In What Ways does the Amount of Vocabulary Differ between a Specialized Text and a Series of Unrelated Academic Texts?

Ecocorp consists of one introductory textbook of economics. It is thus a corpus derived from one writer, on one general topic—economics—which is written so that it forms a coherent continuous text. These features have a marked influence on the size and statistical distribution of the vocabulary in the text. It includes 295294 running words (tokens) with 9469 different word-forms. The most frequent word *the* occurs 22905 times, comprising 7.76% of the total running words. This is normal for ordinary text. The 9469 different words form 5438 word families (57.43% of the word-forms) (see Table 4.1). Ecocorp’s relatively small number of word families tends to occur frequently and reflects the economics focus of the corpus.

Table 4.1 Text size and vocabulary size of Ecocorp and Acacorp

|  |  |  |  |
| --- | --- | --- | --- |
| Texts | Total words | Word-forms | Word families |
| Ecocorp | 295,294 | 9,469 | 5,438 (57.43%) |
| Acacorp | 311,768 | 21,399 | 12,744 (59.55%) |

Acacorp contains approximately the same number of running words as Ecocorp, i.e. 311768 words. It consists of 21399 different word-forms—over twice as many as Ecocorp. Acacorp is the learned and scientific section of the LOB and VUW corpora and consists of 160 texts from a range of academic disciplines including, among others, mathematics, social science, physical science, and humanities. It is thus a corpus representing many writers, on diverse topics, across a wide range of disciplines. As a result, Acacorp has a much larger vocabulary than Ecocorp both in terms of word-forms and word families.

* 1. In What Ways does the Distribution of Vocabulary Differ between a Specialized Text and a Series of Unrelated Academic Texts?

Table 4.2 compares the number of items at each frequency level in both Ecocorp and Acacorp from a frequency of 1 up to 40. From the table we can see that the two lists show different features in terms of the number of items at each frequency. For example, the number of items with a frequency of 1, 2, 3, 4, 5, and so on, in Ecocorp is 1925, 640, 397, 232, and 170 respectively, but in Acacorp is 5364, 1769, 900, 596, and 454.

Table 4.2 The distribution of low-frequency words in Ecocorp and Acacorp (Ecocorp = 5438 word families; Acacorp = 12744 word families)

| Freq. | Number of families in Ecocorp | Number of families in Acacorp |
| --- | --- | --- |
| 1 | 1,925 | 5,364 |
| 2 | 640 | 1,769 |
| 3 | 397 | 900 |
| 4 | 232 | 596 |
| 5 | 170 | 454 |
| 6 | 151 | 333 |
| 7 | 108 | 254 |
| 8 | 108 | 222 |
| 9 | 80 | 186 |
| 10 | 69 | 169 |
| 11 | 79 | 126 |
| 12 | 71 | 110 |
| 13 | 51 | 91 |
| 14 | 54 | 99 |
| 15 | 41 | 88 |
| 16 | 40 | 69 |
| 17 | 36 | 73 |
| 18 | 36 | 70 |
| 19 | 37 | 52 |
| 20 | 36 | 59 |
| 21 | 20 | 44 |
| 22 | 37 | 55 |
| 23 | 25 | 43 |
| 24 | 26 | 41 |
| 25 | 26 | 45 |
| 26 | 15 | 33 |
| 27 | 25 | 48 |
| 28 | 16 | 26 |
| 29 | 17 | 33 |
| 30 | 22 | 35 |
| 31 | 19 | 29 |
| 32 | 19 | 33 |
| 33 | 14 | 39 |
| 34 | 10 | 24 |
| 35 | 12 | 19 |
| 36 | 18 | 21 |
| 37 | 14 | 20 |
| 38 | 10 | 21 |
| 39 | 17 | 22 |
| 40 | 12 | 17 |
| ⋯ |  |  |
| 41+ | 768 | 1,002 |

We have seen that Acacorp has a much larger vocabulary than Ecocorp. Where does this extra vocabulary occur? The extra vocabulary in Acacorp appears to be spread over most of the frequency levels. This extra vocabulary is most noticeable at the lowest frequency levels where, compared to Ecocorp, Acacorp has almost three times as many words which occur once, twice, three times, four times of five times in the corpus (see Table 4.2). These data show that Acacorp has many more words at each of the lower frequency levels than Ecocorp.

Table 4.3 gives further information on higher frequency levels. It identifies the number of items with a frequency of 41 up to the highest frequency in both Ecocorp and Acacorp. The total cumulative figures show that Acacorp has more word families than Ecocorp. There are 768 word families in Ecocorp and 1002 word families in Acacorp at these higher frequency levels.

When we look at the lower level of Table 4.3 in more detail, after the 200 frequency level the relationship of the subtotals changes and Ecocorp equals and then exceeds Acacorp in the number of words at the frequency levels. From a frequency of 301 up to the highest frequency level, Ecocorp has more word families than Acacorp, 155 word families in Ecocorp and 99 in Acacorp. This difference, then, occurs in the highest frequency words. In the economics text words like *price*, *cost*, *demand*, *curve*, *firm*, *supply*, *quantity*, *margin*, *Economy* occur among the 50 most frequent words in the corpus. *Price*, for example, is over thirty times as frequent in Ecocorp as it is in Acacorp.

Acacorp includes more low-frequency words than Ecocorp. The lower the frequency, the more word families are found in Acacorp. Ecocorp however contains more very-high-frequency words.

Table 4.3 The number of word families at high-frequency levels (beginning from frequency 41) in Ecocorp and Acacorp

| Interval | Frequency | Ecocorp | Acacorp |
| --- | --- | --- | --- |
| 5 | 41 – 45 | 50 | 92 |
| 46 – 50 | 42 | 71 |
| 51 – 55 | 35 | 73 |
| 56 – 60 | 44 | 60 |
| 61 – 65 | 34 | 43 |
| 66 – 70 | 22 | 43 |
| 71 – 75 | 27 | 40 |
| 76 – 80 | 29 | 29 |
| 81 – 85 | 18 | 42 |
| 86 – 90 | 14 | 35 |
| 91 – 95 | 18 | 30 |
| 96 – 100 | 15 | 22 |
| 101 – 105 | 12 | 27 |
| 106 – 110 | 17 | 25 |
| **Subtotal** | **377** | **632** |
| 10 | 111 – 120 | 21 | 27 |
| 121 – 130 | 30 | 30 |
| 131 – 140 | 24 | 22 |
| 141 – 150 | 22 | 29 |
| 151 – 160 | 17 | 22 |
| 161 – 170 | 15 | 15 |
| 171 – 180 | 10 | 30 |
| 181 – 190 | 16 | 9 |
| 191 – 200 | 10 | 15 |
| **Subtotal** | **165** | **199** |
| 20 | 201 – 220 | 21 | 20 |
| 221 – 240 | 13 | 15 |
| 241 – 260 | 10 | 18 |
| 261 – 280 | 19 | 9 |
| 281 – 300 | 8 | 10 |
| **Subtotal** | **71** | **72** |
| 50 | 301 - 350 | 21 | 20 |
| 351 - 400 | 17 | 13 |
| 401 - 450 | 16 | 6 |
| 451 - 500 | 9 | 7 |
| **Subtotal** | **63** | **46** |
| 200 | 501 - 700 | 19 | 20 |
| 701 - 900 | 20 | 5 |
| 901 - 1100 | 17 | 2 |
| **Subtotal** | **56** | **27** |
| 300 | 1101 - 1300 | 6 | 3 |
| 1301 - 1600 | 7 | 5 |
| 400 | 1601 - 2000 | 7 | 2 |
| 500 | 2001 - 2500 | 3 | 3 |
| 2501 - 3000 | 4 | 1 |
| 3001 - 3500 | 1 | 5 |
| 500+ | 3501 - 24000 | 8 | 7 |
| **Subtotal** | **36** | **26** |
|  | Total | 768 | 1002 |

Based on the data given above, the following features can be identified:

Ecocorp

1. It has a lower proportion of low-frequency words but has more high-frequency words.
2. It has more high-frequency content words.
3. It has a lot of repetitions of a small number of content words.
4. It has a smaller vocabulary.

Acacorp

1. It has a large proportion of low-frequency words.
2. It has a very rich vocabulary, 12744 words compared with Ecocorp, 5438 words.
3. It has a lower number of high-frequency words.

Another comparison can be seen in Table 4.4, in which the two corpora were compared with the most frequent 2,000 words of GSL (West, 1953) and the University Word List (Xue and Nation, 1984). It shows that Acacorp makes use of a larger number of word families at all word levels including the first 1,000 words. In terms of coverage the major difference is at the 1,000-word level. The small group of high-frequency content words in Ecocorp mentioned above would easily account for this difference.

Table 4.4 The number of word families and coverage of Ecocorp and Acacorp in the 2,000 most frequent words of GSL (West, 1953) and University Word List (Xue and Nation, 1984)

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| Word level | Families in Ecocorp | Coverage of Ecocorp | Families in Acacorp | Coverage of Acacorp |
| 1st 1,000 | 1,029 | 77.72% | 1,095 | 74.11% |
| 2nd 1,000 | 548 | 4.78% | 796 | 4.32% |
| UWL | 636 | 8.74% | 811 | 8.40% |
| Others | 3,225 | 8.77% | 10,042 | 13.16% |
| Total | 5,438 |  | 12,744 |  |

* 1. What are the Features of the Most Frequent Words in the Economics Text Compared with General Academic English?

This section identifies the top 500 content words taken from the first 1,000 words of Ecocorp in terms of frequency rank-order and compares them with the top 1,000 words of Acacorp. The discussion on this is based on the word list provided in Appendix 3. The complete rank-order word list of the first 1,000 words of Ecocorp and Acacorp is provided in Appendix 2. The purpose of this comparison is to show the influence of a single topic focus (economics) on the occurrence of topic-related words.

910 content words were found in the most frequent 1,000 words of Ecocorp (only the most frequent 500 content words are listed in Appendix 3). The surprising feature is that the content words are very high in the rank-order list, beginning from rank 9. The list shows that the words, *price* (3080), *cost* (2251), *demand* (1944), *curve* (1804), *firm* (1743), *supply* (150), *quantity* (1467), *margin* (1427), and some others, are in this top rank with the rank position of 9, 14, 17, 21, 23, 24, 25, 27, respectively. Their frequency in the 295294-word corpus is given in brackets. Moreover, the first 50 words of the Ecocorp list include very-high-frequency economics vocabulary as discussed in the next section. Only 4 words in the first 50 have a higher frequency of occurrence in Acacorp than in Ecocorp, namely *use*, *some*, *such*, *also*, with a rank order in Acacorp of 27, 29, 45, 49, respectively. This is because the most frequent words in Acacorp are function words; while in Ecocorp many content words are repeated more frequently than in Acacorp.

The rank-order list of these 500 content words of Ecocorp ranges from 9 to 579 with a frequency of 3080 to 63 occurrences. Looking at Acacorp, we can see that the top rank is occupied by the words *use*, *make*, *year*, *give*, *time*, *difference*, with a rank order of 27, 37, 43, 51, 53, 55 respectively (see Appendix 2). These words in Ecocorp occupy a low rank-order compared to the top content words of Ecocorp. Comparing the rank-order lists of both Ecocorp and Acacorp, it seems that they do not linearly match with each other. Some of the words in the rank-order list have low ranks in Acacorp, some have high ranks.

The first 50 words of the content-word list, however, are most striking. Most of the rank orders of the words in Ecocorp match with very low ranks in Acacorp, especially in the first 20 words of the list. The top words in Ecocorp, as mentioned above, *price*, *cost*, *demand*, *curve*, *firm*, *supply*, and so on, occur in the very low rank in Acacorp, that is , 479, 471, 411, 526, 991, etc. Some of the words are not in the first 1,000 words of Acacorp, such as *margin*, *revenue*, *profit*, *goods*, and *buy*. In fact, they are in the high rank-order of Ecocorp and occur mush less frequently in Acacorp.

Further investigation also shows that 125 words (25%) from Ecocorp in this 500-word rank-order list are not in the first 1,000 words of Acacorp. And these words are scattered over this 500-word list. On the other hand, of these 500 words of Ecocorp, 18 words do not occur at all in Acacorp. Most of these words have a high frequency of occurrence in the text and therefore, they occupy the top rank-order. This suggests that these words are very important in the economics text. Further information is discussed in more detail in section 4.6 and Table 4.7.

* 1. What Words in the GSL do not Occur or are of Very Low Frequency in Economics Text?

As previously mentioned, the first and the second 1,000 words of the 2,000-word General Service List of English Words (GSL) by Michael West (1953) are very useful for a learner of English as a foreign language. The words in these two lists have a high frequency of occurrence in general English.

However, this group of words might have a less important role in a particular text, such as economics, and therefore occur infrequently. In Ecocorp, we can find some words which have a very low frequency of occurrence, for instance 1 to 5 occurrences, but which can be found in these two lists (GSL). Table 4.5 shows the number and percentage of words occurring 5 times or less from Ecocorp which appear in the first 1,000 words of GSL.

Table 4.5 The word families in Ecocorp with a frequency of 5 or less occurring in the 1st 1,000 and 2nd1, 000 of GSL (Note that 1029 families of the total 1181 word families in the first 1,000 words and 548 of the 956 word families in the second 1,000 words occurred in Ecocorp; the percentage figures relate to these totals)

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| Frequency | Number of words 1st 1,000 | % | Number of words 2nd 1,000 | % |
| 5 | 29 | 2.82% | 22 | 4.01% |
| 4 | 32 | 3.11% | 38 | 6.93% |
| 3 | 42 | 4.08% | 53 | 9.67% |
| 2 | 39 | 3.79% | 67 | 12.22% |
| 1 | 48 | 4.66% | 121 | 22.08% |
| Total | 190 | 18.46% | 301 | 54.91% |

We can also find some word families from the first 2,000 words of GSL which do not occur in Ecocorp. Of the 1181 word families in the first 1,000 words, 152 word families (12.87%) do not occur in Acacorp. In the second 1,000 words, 408 word families (42.68%) out of the 956 word families do not occur in Ecocorp. The following are examples of the words:

The first 1,000 words of GSL: *anyhow*, *anyway*, *bird*, *bleed*, *breadth*, *chair*, *dance*, *dare*, *girl*, *habit*, etc.

The second 1,000 words of GSL: *ache*, *admire*, *amuse*, *annoy*, *arch*, *ash*, *bake*, *blade*, *bone*, *cage*, *cave*, *cheer*, *comb*, *deaf*, *dig*, *frame*, etc.

* 1. What is the Pattern of Overlapping Words in both Economics Text and General Academic Text?

There are several ways of showing the pattern of overlap between the two corpora. One is shown in Table 4.6 where the overlap of the first 4,000 words is divided into eight 500-word levels. The other is shown in Table 4.8. In Table 4.8, the first 5,000 words from the frequency word-list were divided into 10 levels. Beginning from level 2, each level includes the items in the previous level with an addition of 500 items. They are therefore called the first 500, the first 1,000, the first 1,500, the first 2,000, etc. These two tables give information on the word frequency rank in both Ecocorp and Acacorp and also give information on the features of the words at each level.

* + 1. The Pattern of Overlapping Items of the Eight Most-Frequent-500-Word Levels of Economics Text and General Academic Text

Table 4.6 shows words in the eight 500-word levels in Ecocorp compared with the eight levels in Acacorp. The words in the first 500-word level of Ecocorp, for example, mostly occur in the first three levels of Acacorp; 287 items (57.4%) occur in the first 500-word level and 103 items (20.6%) in the second 500-word level. From level 3 on of Acacorp, the overlap is much smaller; 40 items (8%) in the third level, 13 items (2.6%) in the fourth level, 17 items (3.4%) in the fifth level, 6 items (1.2%) in the sixth level, 5 items (1%) in the seventh level, and 3 items (0.6%) in the eighth level. As Table 4.7 shows, this makes up 474 items (94.8%) in Ecocorp occurring in the first 4,000 words of Acacorp. The others, 26 items (5.2%) do not occur in the first 4,000 words; 11 items (2.2%) are outside the first 4,000 words of Acacorp and 15 items (3%) are not in Acacorp. Similar information about this word distribution with the other levels can also be seen in these two tables.

As we move horizontally, a regular pattern most clearly occurs in the first two levels of Ecocorp. The highest percentages of occurrence of the words from Ecocorp in Acacorp are in the first 500-word level, 57.4% in EC1 and 27.4% in EC2. Then, except in overlap of EC1 and AC5, the figures are decreasing from one to another until the last level (AC8). In EC1/AC5 the figure is an increase of 0.8% from 2.6% in AC4 to 3.4% in AC5. EC3 (the third 500-word level) has a similar pattern. The highest figure occurs at AC2 (19.6%). At AC2 the figure increases by 11.6%, and beginning from AC3 on, the figures gradually decrease.

The other pattern can be seen at the largest overlaps in both Ecocorp and Acacorp. In almost every level, except levels 1, 7, and 8 of Ecocorp, the pattern is clear that the highest overlaps of levels 2 to 6 of Ecocorp occur one level behind the same level of Acacorp. If we look through every level of Ecocorp, we can see that the highest overlap of level 2 of Ecocorp is in level 1 of Acacorp (27.4%), and then the highest overlap of level 3 of Ecocorp is in level 2 of Acacorp (19.6%), etc. This pattern still occurs up to level 6, 17.4%, 11.8%, and 6.8%. The highest overlaps of levels 7 and 8 of Ecocorp are in fact in levels 4 and 6 (7% and 3.8%), three and two levels behind the same level of Acacorp. This pattern of overlap occurs because of the group of very-high-frequency, topic-related content words that occur in Ecocorp and because of the greater number of words at almost every frequency level of Acacorp.

Table 4.6 The overlap between eight 500-word levels of Ecocorp and eight 500-word levels of Acacorp

|  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- |
|  | AC 1 | AC 2 | AC 3 | AC 4 | AC 5 | AC 6 | AC 7 | AC 8 |
| **EC 1** | 287 | 103 | 40 | 13 | 17 | 6 | 5 | 3 |
| 57.4% | 20.6% | 8% | 2.6% | 3.4% | 1.2% | 1% | 0.6% |
| **EC 2** | 137 | 111 | 71 | 35 | 23 | 20 | 9 | 6 |
| 27.4% | 22.2% | 14.2% | 7% | 4.6% | 4% | 1.8% | 1.2% |
| **EC 3** | 40 | 98 | 74 | 58 | 38 | 26 | 11 | 12 |
| 8% | 19.6% | 14.8% | 11.6% | 7.6% | 5.2% | 2.2% | 2.4% |
| **EC 4** | 14 | 62 | 87 | 56 | 30 | 30 | 36 | 20 |
| 2.8% | 12.4% | 17.4% | 11.2% | 6% | 6% | 7.2% | 4% |
| **EC 5** | 7 | 39 | 44 | 59 | 26 | 27 | 22 | 23 |
| 1.4% | 7.8% | 8.8% | 11.8% | 5.2% | 5.4% | 4.4% | 4.6% |
| **EC 6** | 4 | 17 | 30 | 25 | 34 | 32 | 24 | 21 |
| 0.8% | 3.4% | 6% | 5% | 6.8% | 6.4% | 4.8% | 4.2% |
| **EC 7** | 3 | 12 | 20 | 35 | 19 | 21 | 12 | 21 |
| 0.6% | 2.4% | 4% | 7% | 3.8% | 4.2% | 2.4% | 4.2% |
| **EC 8** | - | 4 | 9 | 15 | 12 | 19 | 17 | 9 |
| 0.8% | 1.8% | 3% | 2.4% | 3.8% | 3.4% | 1.8% |

If we move diagonally through Table 4.6, we can see the overlapping words of the same levels of Ecocorp and Acacorp. Looking at level EC1 overlapping with level AC1, level EC2 overlapping with level AC2, etc., it is found that, except for level 6, the percentage figures are decreasing beginning from level 1 (the first 500-word level), 57.4%, to level 2, 22.2%, to level 3, 14.8%, etc. The percentage drop from one level to another ranges from 34.8% to 0.6% with an average percentage decrease of 9.4%. The highest decreasing percentage occurs between level 1 and level 2, i.e. from 57.4% to 22.2%. In level 6 the overlap figure is, in fact, increasing from 5.2% in level 5 to 6.4% in level 6 (Figure 4.1).

This pattern of overlap indicates that the biggest overlap of items occurs in level 1 (the first 500-word level) and the smallest is in the eighth 500-word level. The figures are decreasing regularly as we move to the lowest frequency of occurrence. This means that the higher the frequency, the more opportunity for the words of the same rank to overlap.

Figure 4.1 The pattern of overlapping items among the eight 500-word levels of Ecocorp and Acacorp

The following points can be drawn from the discussion above:

1. The highest overlap among the eight levels of Ecocorp and Acacorp is in level 1 that is 57.4% (287 words).
2. The pattern of overlap of the first two levels of Ecocorp and Acacorp is the same in that they decrease regularly from one another.
3. The largest overlap of these two levels of Ecocorp is in level 1 of Acacorp.
4. From level 1 to level 2 of Ecocorp, the highest overlap drops drastically from 57.4% to 27.4%.
5. After level 2 of Ecocorp, the highest overlap of every level decreases slightly and regularly until level 8.
6. The highest overlaps of level 2 up to level 6 of Ecocorp occur one level behind the same level in Acacorp.
7. The increasing and decreasing overlap at each level follows a regular pattern.
   * 1. The Cumulative Overlap of Economics Text and General Academic Text

Table 4.7 shows the occurrences of words in each level of Ecocorp appearing in Acacorp. The words in the first 500-word level in Ecocorp, for example, mostly occur in the first 4,000 words of Acacorp. Almost all of the words in the first 500-word level of Ecocorp (94.8%) are also found in the eight levels in Acacorp (the first 4,000 words). Only 2.2% (11 items) of the words are outside the first 4,000 words and 3% (15 items) are not in Acacorp. In other words, this 5.6% of the words (28 out of 500) are not found in the first 4,000 words of Acacorp.

Table 4.7 The occurrences of words in each level of Ecocorp in Acacorp

|  |  |  |  |
| --- | --- | --- | --- |
| Ecocorp | Occur in the first 4,000 of Acacorp | Occur outside the first 4,000 of Acacorp | Words not in Acacorp |
| **1st 500** | 474 | 11 | 15 |
| 94.8% | 2.2% | 3% |
| **2nd 500** | 412 | 41 | 47 |
| 82.4% | 8.2% | 9.4% |
| **3rd 500** | 357 | 59 | 84 |
| 71.4% | 11.8% | 16.8% |
| **4th 500** | 335 | 63 | 102 |
| 67% | 12.6% | 20.4% |
| **5th 500** | 247 | 108 | 145 |
| 49.4% | 21.6% | 29% |
| **6th 500** | 187 | 129 | 184 |
| 37.4% | 25.8% | 36.8% |
| **7th 500** | 143 | 110 | 247 |
| 28.6% | 22% | 49.4% |
| **8th 500** | 85 | 93 | 322 |
| 17% | 18.6% | 64.4% |

The table also shows that in every level of Ecocorp there are a number of words which are not found in Acacorp. This is a result of the narrow, specialized nature of Ecocorp. There is a regular pattern to the change of the number of words as it goes to the lower frequency levels. The number of words decreases from the highest level of 94.4% in the 1st 500 to 17% in the 8th 500. Thus, the lower the frequency level, the less overlapping items occur in Ecocorp and Acacorp. The number of the words not in Acacorp gradually increases from 3% in the first 500-word level to 64.4% in the eighth 500-word level, while the increase in percentages ranges from 6% to 15% with an average of 8.71% (see Figure 4.2).

The figures indicate that the first 500-word level of Ecocorp contains very common words that also occur in the first 4,000 words of Acacorp. As frequency decreases, the more the vocabularies of the two corpora differ. This is most likely influenced by the content matter of the corpora.

Another view of the overlapping of items is shown in Table 4.8. The pattern of overlap is quite different from that in the previous one. From this table we can see that the largest proportion of the words which occur in both Ecocorp and Acacorp is in the first 2,000-wordlevel; that is, 1284 (47.28%) out of the 2716 different items occur in both Ecocorp and Acacorp. This level has the largest overlap compared with the other nine levels (see Figure 4.3).

Figure 4.2 The items not in Acacorp from the eight 500-word levels of Ecocorp

Table 4.8 The distribution of words occurring in both Ecocorp and Acacorp from the first 500 up to the first 5,000

| Level | Common | Unmatched | Cumulative Total |
| --- | --- | --- | --- |
| 1st 500 | 287 | 430 | 717 |
| (40.03%) | (59.97%) | (100%) |
| 1st 1,000 | 636 | 728 | 1364 |
| (46.63%) | (53.37%) | (100%) |
| 1st 1,500 | 960 | 1080 | 2040 |
| (47.06%) | (52.94%) | (100%) |
| 1st 2,000 | 1284 | 1432 | 2716 |
| (47.28%) | (52.72%) | (100%) |
| 1st 2,500 | 1567 | 1866 | 3433 |
| (45.65%) | (54.35%) | (100%) |
| 1st 3,000 | 1819 | 2362 | 4181 |
| (43.51%) | (56.49%) | (100%) |
| 1st 3,500 | 2048 | 2904 | 4952 |
| (41.36%) | (58.64%) | (100%) |
| 1st 4,000 | 2239 | 3522 | 5761 |
| (38.86%) | (61.14%) | (100%) |
| 1st 4,500 | 2403 | 4194 | 6597 |
| (36.43%) | (63.57%) | (100%) |
| 1st 5,000 | 2576 | 4848 | 7424 |
| (34.70%) | (65.30%) | (100%) |

Relating to the overlap items between Ecocorp and Acacorp, the first 500-word level has the lowest proportion compared to other levels up to the first 2,000-word level. Only 40.03% (287 items) of the total different word families (717) in Ecocorp and Acacorp are in this level; the other 430 words (59.97%) are unmatched, scattered over the other levels. Compared to the other levels in Table 4.8, this small proportion is due to the fact that only a small number of words have the opportunity to overlap, i.e. only 500 word families from both Ecocorp and Acacorp. Some of the words in this level might match with other words in other levels. On the other hand, the words in other levels—the first 1,000, the first 1,500, and the first 2,000—have much more opportunity to overlap than in the first 500.

Figure 4.3 The distribution of overlapping words occurring in both Ecocorp and Acacorp from the first 500-word level up to the first 5,000-word level

The figures begin to increase from the first 500 up to the first 2,000. The overlap of the next level (the first 1,000) is slightly bigger that the first one, but this figure is not much different from the next levels, the first 1,500 and the first 2,000. At this level, almost 50% of the items overlap. From the total of 1364 different words occurring in both Ecocorp and Acacorp, there are 636 overlapping items. We also find that this level gets an increase of 6.6% from 40.03% to 46.63%. This is the highest increase compared to the one in the other levels up to the first 2,000, 0.76% and 0.12%.

However, the overlap figures for the items after the first 2,000 are slightly decreasing by an average of 1.80% (1.63%, 2.14%, 2.15%, 2.50%, 2.43%, and 1.73%). For the last level—the first 5,000—the percentage overlap of items reaches only 34.70% from the 7424 different items in Ecocorp and Acacorp (see Figure 4.3). This pattern is a result of the effect of low-frequency items in both corpora. Acacorp contains a wide variety of low-frequency items so that the lower the frequency of occurrence in Acacorp, the more variety of words occur in Acacorp and thus they provide less opportunity to overlap. The group of very-high-frequency content words in Ecocorp reduced the amount of overlap at the first 500-word level. The first 2,000 words provide the greatest amount of overlaps as these include many of the general-service words of the language.

* 1. What Kinds of General Words Occur in both Economics Text and General Academic Text?

In the two texts—Ecocorp and Acacorp—there is a common factor in that they are both dealing with academic English. It is not surprising that there is some vocabulary which occurs in both texts. Ecocorp uses language dealing with the study of economics, whilst Acacorp is a corpus of general academic English composed of texts from LOB and VUW representing different academic disciplines.

As already mentioned, one of the main purposes of this study is to look at the overlap of words between Ecocorp and Acacorp, i.e. the words that occur in both Ecocorp and Acacorp texts. What words and how many words overlap? To what extent are they similar? In what level do they mostly overlap? Why do they overlap? Among the levels of overlap, the first 500 and the first 2,000 are more interesting to look at than the other levels. This is because these two levels have the highest overlapping proportions in each table. We will now look at these two in turn.

* + 1. The Overlap of the First 500-Word Level

The words in this level from either Ecocorp or Acacorp are high-frequency words. The highest-frequency word *the* which occurs in both corpora is of course in this level; there are 22905 occurrences in Ecocorp and 23890 in Acacorp.

When we compare the overlap of the first 500-word level with the other 500-word levels in Table 4.6, the figure in this level is much higher than the others. The table shows that in this first 500, 57.4% of the 500 words occurred in both Ecocorp and Acacorp. This high proportion of overlap, as shown in Table 4.6, is due to several reasons. On one hand, the highest-frequency words in a count of any kind of connected text occur in this level in both Ecocorp and Acacorp. 12.4% of the word families (62 items) in this level are function words. Typical items are articles *a*/*an* and *the*, and the prepositions.

The following is a list of function words found in the overlap of the first 500-word levels of both Ecocorp and Acacorp:

Articles and determiners : *a*, *an*, *the*, *many*, *few*, *some*, *each*, *all*, *another*

Pronouns : *I*, *it*, *he*, *she*, *they*, *we*, *you*, *what*, *who*, *when*, *where*, *which*, *that*

Prepositions :*on*, *at*, *of*, *about*, *above*, *for*, *from*, *in*, *out*, *over*, *under*, *up*, *with*,

*though*, *to*, *into*, *by*

Conjunctions : *so*, *and*, *but*, *although*, *though*, *if*, *or*, *then*, *while*, *whether*, *both*,

*because*, *before*, *after*

Auxiliary verbs : *be*, *being*, *can*, *do*, *has*, *would*, *will*, *may*, *must*

Some of those function words may have several functions. For example, *what*, *who*, *when*, *where*, *which*, and *that* can also function as interrogatives and relative pronouns; *all*, *another*, *each*, *many*, *few*, and *some* as pronouns; and *to* as an infinitive marker (Greenbaum and Quirk, 1990).

Some other overlapping words in this level are common items not only in academic English but also in general English used for a variety of purposes. One way of defining this group of words is to use the first 1,000 words of West’s (1953) General Service List. This, of course, must include the function words mentioned above. From the data, it is found that of the 287 overlapping items from Ecocorp and Acacorp, 250 items (87.10%) belong to high-frequency words occurring in the first 1,000 words of GSL. 7 items (2.44%) occur in the second 1,000 words, and 25 items (8.71%) in the University Word List (Xue and Nation, 1984). Table 4.9 lists the items occurring in the first 1,000 words of GSL from the overlap of the first 500 words of Ecocorp and Acacorp. For more detail, see Figure 4.4.

Table 4.9 The overlapping words of the first 500-word level occurring in the first 1,000 of GSL

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| A | DEMAND | INCLUDE | OUT | SUCH |
| ABLE | DEPEND | INCREASE | OVER | SYSTEM |
| ABOUT | DESCRIBE | INFLUENCE | OWN | TABLE |
| ABOVE | DETERMINE | INTEREST | PART | TAKE |
| ACCOUNT | DEVELOP | INTO | PARTICULAR | TAX |
| ACT | DIFFERENCE | IT | PARTY | TERM |
| ACTUAL | DO | JUST | PAY | THAN |
| ADD | EACH | KNOW | PEOPLE | THAT |
| AFTER | EFFECT | LAND | PER | THE |
| AGREE | EMPLOY | LARGE | PERSON | THEN |
| ALL | ENTER | LAST | PLACE | THERE |
| ALMOST | EQUAL | LAW | POINT | THEREFORE |
| ALSO | EVEN | LEAD | POLITICAL | THEY |
| ALTHOUGH | EVERY | LEFT | POSSIBLE | THING |
| ALWAYS | EXAMPLE | LESS | POWER | THIS |
| AMONG | EXIST | LEVEL | PRESENT | THOUGH |
| AMOUNT | EXPECT | LIFE | PRICE | THREE |
| AND | EXPLAIN | LIKE | PROBLEM | THROUGH |
| ANOTHER | FACT | LIMIT | PRODUCE | THUS |
| ANY | FALL | LINE | PRODUCT | TIME |
| APPEAR | FAMILY | LONG | PROVIDE | TO |
| AS | FEW | LOW | PUBLIC | TOTAL |
| AT | FIGURE | MAIN | QUESTION | TWO |
| AVERAGE | FIND | MAKE | RATE | TYPE |
| BACK | FIRST | MANY | REAL | UNDER |
| BASE | FIVE | MARKET | REASON | UNDERSTAND |
| BE | FOLLOW | MAY | RELATION | UP |
| BECAUSE | FOR | MEAN | REMAIN | USE |
| BECOME | FORCE | MEASURE | RESULT | VALUE |
| BEFORE | FORM | MORE | RIGHT | VERY |
| BEGIN | FOUR | MOST | RISE | WAY |
| BEING | FREE | MOVE | RULE | WE |
| BETWEEN | FROM | MUCH | SAME | WELL |
| BRING | GENERAL | MUST | SAY | WHAT |
| BUILD | GET | NATION | SCALE | WHEN |
| BUT | GIVE | NATURE | SECOND | WHERE |
| BY | GO | NEED | SEE | WHETHER |
| CALL | GOOD | NEW | SERVICE | WHICH |
| CAN | GREAT | NO | SET | WHILE |
| CASE | GROUP | NOT | SHE | WHO |
| CHANGE | GROW | NOW | SHORT | WILL |
| CLOSE | HAS | NUMBER | SHOW | WITH |
| COMMON | HE | OBSERVE | SINCE | WORK |
| COMPARE | HIGH | OF | SIZE | WORLD |
| CONDITION | HOLD | ON | SMALL | WOULD |
| CONSIDER | HOUSE | ONE | SO | YEAR |
| CONTROL | HOW | ONLY | SOCIAL | YOU |
| COST | I | OPERATE | SOME |  |
| COUNTRY | IF | OR | SPECIAL |  |
| DAY | IMPORTANT | ORDER | STATE |  |
| DEGREE | IN | OTHER | STUDY |  |

Another group of overlapping words in this first 500-word level can be categorized as academic English or sub-technical vocabulary which belongs to the University Word List. The proportion of these words at this level is low, because the items in this level are likely to be dominated by general English as described above. Only 25 items out of the 287 overlapping items are from the UWL. Once again, we see how the focus of a corpus—in this case academic—influences even the very high frequency levels of vocabulary. The academic focus results in academic vocabulary not in the General Service List occurring among the most frequent 500 items of both corpora.

Figure 4.4 The distribution of words in the overlap of the first 500-word levels of Ecocorp and Acacorp

Note: A : The overlapping items of the first 500 words of Ecocorp and Acacorp—287 items (40.25%)

B : Non-overlapping items in Ecocorp—215 items (29.99%)

C : Non-overlapping items in Acacorp—215 items (29.99%)

A1 : The items from the overlap occurring in the first 1,000 words of GSL—250 out of 287 items (87.10%)

A2 : The items from the overlap occurring in the second 1,000 words of GSL—7 out of 287 items (2.44%)

A3 : The items from the overlap occurring in UWL—25 out of 287 (8.71%)

A4 : Other items from the overlap—7 out of 287 items (2.43%)

Table 4.10 shows that almost half of them (12 items) have a higher frequency of occurrence in Ecocorp than in Acacorp.

Table 4.10 The words from overlap of the first 500-word level occurring in academic English

| Word | Frequency | | Word | Frequency | |
| --- | --- | --- | --- | --- | --- |
| Aca | Eco | Aca | Eco |
| AFFECT | 87 | 87 | OCCUR | 237 | 198 |
| ANALYZE | 232 | 109 | PERIOD | 179 | 108 |
| AREA | 309 | 99 | PROCESS | 158 | 130 |
| ASSUME | 160 | 91 | RANGE | 168 | 88 |
| AVAILABLE | 145 | 193 | RATIO | 103 | 91 |
| COMPUTE | 93 | 151 | REQUIRE | 278 | 82 |
| DISTRIBUTE | 127 | 259 | RESPOND | 155 | 91 |
| ECONOMY | 132 | 1353 | SIMILAR | 194 | 152 |
| FACTOR | 143 | 406 | TECHNIQUE | 111 | 122 |
| INCOME | 96 | 1183 | TECHNOLOGY | 93 | 266 |
| INDIVIDUAL | 208 | 338 | THEORY | 256 | 312 |
| LABOUR | 131 | 1004 | VARY | 236 | 454 |
| METHOD | 288 | 145 |  |  |  |

These items are:*available*, *compute*, *distribute*, *economy*, *factor*, *income*, *individual*, *labour*, *technique*, *technology*, *theory*, and *vary*. The most noticeable of these are *economy* and *labour*, where the difference in frequency is very large.

* + 1. The Overlap of the First 2,000-Word Level

1284 out of 2716 different words (47.28%) in the first 2,000-word level of Ecocorp and Acacorp overlap. This means that 716 words (35.8%) do not match in the first 2,000 of both corpora. Besides the very frequent words discussed in the first 500-word level, a great number of the most common academic English words also occur in this level. This can be seen by comparing the overlapping items with the first 2,000 of GSL (West, 1953) and UWL (Xue and Nation, 1984). It was found that of the 1284 word families, 764 items (59.50%) occur in the first 1,000 words of GSL. This means more than half of the overlapping items belong to the very common words of the language. 138 words (11.03%) occur in the second 1,000 words. Meanwhile, another group of words, 287 items or 22.35%, appear in the University Word List.

Table 4.11 The frequency distribution of Ecocorp and Acacorp within every 500-word level

| Level | Ecocorp | | | Acacorp | | |
| --- | --- | --- | --- | --- | --- | --- |
| 1st 500 | 22905 | - | 78 | 23890 | - | 87 |
| the |  | exist | the |  | rise |
| 2nd 500 | 78 | - | 26 | 87 | - | 41 |
| gallon |  | green | speak |  | sure |
| 3rd 500 | 26 | - | 12 | 41 | - | 24 |
| insurance |  | fashion | top |  | overall |
| 4th 500 | 12 | - | 6 | 24 | - | 15 |
| fierce |  | ceteris | participate |  | deliberate |
| 5th 500 | 6 | - | 4 | 15 | - | 10 |
| chart |  | tag | devise |  | adverb |
| 6th 500 | 4 | - | 2 | 10 | - | 8 |
| thermometer |  | captions | Africa |  | pompilid |
| 7th 500 | 2 | - | 2 | 8 | - | 6 |
| carpenter |  | Uruguay | pose |  | intensive |
| 8th 500 | 2 | - | 1 | 6 | - | 5 |
| usable |  | document | intravenous |  | ref |

The factor that makes the overlap high is that the words outside this level are unlikely to match each other. This is because of a very low frequency of occurrence of the words outside this level—6 to 4 in Ecocorp and 15 to 10 in Acacorp (see Table 4.11). There was certainly less tendency to overlap. The overlap after this level is gradually decreasing by about 2%. In the first 5,000-word level of both Ecocorp and Acacorp, 34.70% of the 7424 different words overlap.

CHAPTER V | Technical Words

This chapter looks at the behavior of words that occur frequently in Ecocorp. It examines groups of words and individual words. The purpose of the examination is to see some of the factors like relative frequency and collocations which help to distinguish technical words from general-purpose vocabulary.

1. 1. What are the Distinct Features of High- and Low-Frequency Words in the Economics Text and General Academic Text?

This part deals mainly with the discussion of the high- and low-frequency words occurring in both Ecocorp and Acacorp. It identifies, by comparison, the words which we can categorize as either typical of Ecocorp or Acacorp. It also shows how the narrow focus of Ecocorp results in some high-frequency words occurring with unusually high frequencies, because they are useful in the field of economics.

Many words have quite different frequencies in Ecocorp and Acacorp. Some words have a high frequency in Ecocorp but low in Acacorp and vice versa, and this comparison can be used as a way of determining vocabulary which could be considered typical of each corpus. Tables 5.1 and 5.2 show which of the words are much more frequent in one corpus than in the other. The words were taken from the overlap of the first 1,000 words because the words at this level of Ecocorp or Acacorp are very-high-frequency items. There are 636 overlapping items. The words were also selected based on the size of the frequency gap between Ecocorp and Acacorp, i.e. the items which are at least twice more frequent in one corpus than in the other.

Table 5.1 The alphabetical list of the 111 overlapping words from the most-frequent-1,000-word level—which occur much more frequently in Ecocorp

| **No.** | **Word** | **Ecocorp** | **Acacorp** |
| --- | --- | --- | --- |
| **1** | AMOUNT | 376 | 106 |
| **2** | ANSWER | 143 | 65 |
| **3** | ARISE | 130 | 55 |
| **4** | AVERAGE | 777 | 90 |
| **5** | BENEFIT | 306 | 57 |
| **6** | BEST | 173 | 66 |
| **7** | CALCULATE | 266 | 82 |
| **8** | CALL | 236 | 98 |
| **9** | CAPITAL | 907 | 50 |
| **10** | CHANGE | 927 | 316 |
| **11** | CHAPTER | 282 | 63 |
| **12** | CONSTANT | 197 | 77 |
| **13** | CONSUME | 955 | 70 |
| **14** | COST | 2251 | 91 |
| **15** | CURVE | 1804 | 83 |
| **16** | CUT | 107 | 51 |
| **17** | DECISION | 138 | 57 |
| **18** | DEMAND | 1944 | 102 |
| **19** | DISTRIBUTE | 259 | 127 |
| **20** | DIVIDE | 156 | 53 |
| **21** | EACH | 1036 | 382 |
| **22** | ECONOMY | 1353 | 172 |
| **23** | EFFORT | 105 | 50 |
| **24** | EQUAL | 628 | 109 |
| **25** | EXAMPLE | 599 | 263 |
| **26** | FACTOR | 406 | 143 |
| **27** | FALL | 492 | 109 |
| **28** | FIG | 421 | 174 |
| **29** | FIGURE | 455 | 148 |
| **30** | FINANCE | 149 | 53 |
| **31** | FIRM | 1743 | 41 |
| **32** | FUTURE | 209 | 49 |
| **33** | GAIN | 152 | 43 |
| **34** | GENERATE | 144 | 41 |
| **35** | GOOD | 659 | 102 |
| **36** | GOVERN | 478 | 166 |
| **37** | HAPPEN | 132 | 42 |
| **38** | HOUR | 445 | 77 |
| **39** | HOUSEHOLD | 360 | 41 |
| **40** | HOW | 710 | 176 |
| **41** | IF | 1002 | 662 |
| **42** | ILLUSTRATE | 202 | 71 |
| **43** | INCOME | 1183 | 96 |
| **44** | INCREASE | 1002 | 277 |
| **45** | INDUSTRY | 777 | 186 |
| **46** | INTEREST | 444 | 213 |
| **47** | INTERNATIONAL | 172 | 52 |
| **48** | JOB | 115 | 53 |
| **49** | LABOUR | 1004 | 131 |
| **50** | LET | 332 | 65 |
| **51** | LINE | 437 | 157 |
| **52** | LOOK | 240 | 76 |
| **53** | LOSS | 253 | 62 |
| **54** | MACHINE | 169 | 45 |
| **55** | MARKET | 1104 | 110 |
| **56** | MAXIMUM | 361 | 79 |
| **57** | MILLION | 445 | 42 |
| **58** | MINIMUM | 213 | 52 |
| **59** | MONEY | 132 | 59 |
| **60** | MONTH | 165 | 75 |
| **61** | NEGATIVE | 92 | 49 |
| **62** | NEXT | 146 | 61 |
| **63** | ORGANIZE | 138 | 58 |
| **64** | OUTPUT | 861 | 50 |
| **65** | PAY | 618 | 130 |
| **66** | PEOPLE | 555 | 241 |
| **67** | PER | 470 | 214 |
| **68** | PERCENT | 450 | 41 |
| **69** | PLANT | 254 | 83 |
| **70** | PLAY | 181 | 51 |
| **71** | POINT | 702 | 313 |
| **72** | POSITIVE | 120 | 55 |
| **73** | PREDICT | 149 | 51 |
| **74** | PRICE | 3080 | 90 |
| **75** | PRODUCE | 1237 | 167 |
| **76** | PRODUCT | 749 | 106 |
| **77** | PRODUCTION | 772 | 84 |
| **78** | QUANTITY | 1467 | 53 |
| **79** | RAISE | 129 | 51 |
| **80** | RATE | 915 | 293 |
| **81** | RECEIVE | 160 | 69 |
| **82** | RELATIONSHIP | 219 | 86 |
| **83** | RESTRICT | 152 | 75 |
| **84** | RETURN | 168 | 56 |
| **85** | RISE | 534 | 87 |
| **86** | RUN | 191 | 63 |
| **87** | SAVE | 133 | 44 |
| **88** | SCALE | 280 | 108 |
| **89** | SERVICE | 376 | 122 |
| **90** | SHARE | 166 | 55 |
| **91** | SHIFT | 203 | 57 |
| **92** | SITUATION | 225 | 75 |
| **93** | SPEND | 275 | 50 |
| **94** | STOCK | 324 | 72 |
| **95** | SUPPLY | 1590 | 86 |
| **96** | SUPPOSE | 206 | 56 |
| **97** | TAX | 413 | 112 |
| **98** | TECHNOLOGY | 266 | 93 |
| **99** | TODAY | 119 | 44 |
| **100** | TOTAL | 946 | 114 |
| **101** | TRADE | 621 | 85 |
| **102** | UNION | 166 | 72 |
| **103** | WAGE | 552 | 75 |
| **104** | WANT | 173 | 87 |
| **105** | WEEK | 205 | 68 |
| **106** | WHAT | 870 | 380 |
| **107** | WHY | 307 | 50 |
| **108** | WILL | 1378 | 523 |
| **109** | WORK | 906 | 480 |
| **110** | YOU | 866 | 118 |
| **111** | ZERO | 164 | 55 |

111 items, 17.45% of the 636 overlapping items, are at least twice as frequent in Ecocorp (see Table 5.1). 166 items (26.10%) of the 636 overlapping items are at least twice as frequent in Acacorp. They are, in fact, typical of general academic vocabulary (Table 5.2).

Table 5.2 The alphabetical list of the 166 overlapping words from the most-frequent-1,000-word level—which occur much more frequently in Acacorp

| No. | Word | Acacorp | Ecocorp |
| --- | --- | --- | --- |
| 1 | ACCEPT | 98 | 30 |
| 2 | ACT | 188 | 65 |
| 3 | AFTER | 458 | 121 |
| 4 | AGAINST | 158 | 73 |
| 5 | AIR | 130 | 50 |
| 6 | ANALYZE | 232 | 109 |
| 7 | APPEAR | 178 | 78 |
| 8 | APPLY | 260 | 74 |
| 9 | APPROACH | 130 | 46 |
| 10 | AREA | 309 | 99 |
| 11 | ASSOCIATE | 100 | 30 |
| 12 | ATTEMPT | 102 | 42 |
| 13 | BEFORE | 217 | 83 |
| 14 | CARE | 95 | 37 |
| 15 | CATEGORY | 93 | 28 |
| 16 | CAUSE | 142 | 51 |
| 17 | CENT | 129 | 27 |
| 18 | CENTRE | 131 | 59 |
| 19 | CERTAIN | 233 | 61 |
| 20 | CHARACTERISTIC | 61 | 32 |
| 21 | CLEAR | 172 | 55 |
| 22 | COME | 193 | 73 |
| 23 | COMPLETE | 162 | 42 |
| 24 | COMPONENT | 56 | 29 |
| 25 | CONCERN | 149 | 40 |
| 26 | CONCLUDE | 85 | 34 |
| 27 | CONSIDER | 343 | 135 |
| 28 | CONSIST | 94 | 37 |
| 29 | CONSTRUCT | 81 | 36 |
| 30 | CONTAIN | 148 | 32 |
| 31 | CONTRAST | 51 | 26 |
| 32 | CONTRIBUTE | 91 | 36 |
| 33 | CORRECT | 60 | 28 |
| 34 | CORRESPOND | 82 | 36 |
| 35 | COURSE | 155 | 40 |
| 36 | DATA | 215 | 41 |
| 37 | DEFINE | 180 | 71 |
| 38 | DESIGN | 103 | 39 |
| 39 | DETAIL | 102 | 43 |
| 40 | DEVELOP | 296 | 119 |
| 41 | DIFFICULT | 185 | 26 |
| 42 | DIRECT | 132 | 65 |
| 43 | DURING | 186 | 51 |
| 44 | EARLY | 211 | 73 |
| 45 | EDUCATE | 153 | 61 |
| 46 | ELEMENT | 85 | 28 |
| 47 | END | 174 | 66 |
| 48 | EQUATION | 153 | 76 |
| 49 | ESTABLISH | 107 | 45 |
| 50 | ESTIMATE | 126 | 29 |
| 51 | EVENT | 128 | 40 |
| 52 | EXPERIENCE | 137 | 51 |
| 53 | EXPRESS | 87 | 41 |
| 54 | FAILURE | 83 | 39 |
| 55 | FAR | 134 | 38 |
| 56 | FIND | 415 | 108 |
| 57 | FOOT | 55 | 27 |
| 58 | FORM | 491 | 138 |
| 59 | FUNCTION | 201 | 69 |
| 60 | FURTHER | 167 | 59 |
| 61 | GENERAL | 313 | 107 |
| 62 | HAND | 95 | 41 |
| 63 | HE | 1590 | 385 |
| 64 | HERE | 139 | 58 |
| 65 | HOME | 105 | 30 |
| 66 | HOWEVER | 343 | 78 |
| 67 | I | 615 | 240 |
| 68 | IMPORTANCE | 73 | 27 |
| 69 | IMPROVE | 80 | 38 |
| 70 | INCLUDE | 210 | 90 |
| 71 | INDICATE | 146 | 32 |
| 72 | INFORM | 216 | 100 |
| 73 | INTERPRET | 61 | 32 |
| 74 | INVOLVE | 145 | 36 |
| 75 | ISLAND | 73 | 30 |
| 76 | KIND | 105 | 46 |
| 77 | KNOW | 298 | 126 |
| 78 | KNOWLEDGE | 100 | 31 |
| 79 | LATE | 176 | 46 |
| 80 | LEAST | 143 | 53 |
| 81 | LIGHT | 96 | 30 |
| 82 | LITTLE | 161 | 42 |
| 83 | LIVE | 130 | 60 |
| 84 | MAINTAIN | 92 | 31 |
| 85 | MAJOR | 140 | 49 |
| 86 | MAN | 178 | 47 |
| 87 | MARK | 89 | 33 |
| 88 | MATERIAL | 160 | 62 |
| 89 | MAY | 632 | 162 |
| 90 | MEAN | 315 | 133 |
| 91 | METHOD | 288 | 145 |
| 92 | MIDDLE | 70 | 31 |
| 93 | MIGHT | 176 | 61 |
| 94 | MUST | 306 | 96 |
| 95 | NAME | 111 | 30 |
| 96 | NECESSARY | 182 | 35 |
| 97 | NEVER | 59 | 30 |
| 98 | NORMAL | 130 | 56 |
| 99 | OBTAIN | 199 | 56 |
| 100 | OBVIOUS | 85 | 30 |
| 101 | OFTEN | 191 | 47 |
| 102 | OLD | 137 | 27 |
| 103 | OPEN | 79 | 32 |
| 104 | ORDER | 160 | 79 |
| 105 | PARTICULAR | 298 | 114 |
| 106 | PASS | 102 | 44 |
| 107 | PATTERN | 88 | 43 |
| 108 | PERHAPS | 89 | 39 |
| 109 | POSITION | 135 | 28 |
| 110 | PRACTICE | 98 | 48 |
| 111 | PRECISE | 53 | 27 |
| 112 | PREVIOUS | 101 | 40 |
| 113 | PRINCIPLE | 133 | 62 |
| 114 | PROPORTION | 110 | 39 |
| 115 | RANGE | 168 | 88 |
| 116 | RATHER | 153 | 63 |
| 117 | READ | 146 | 50 |
| 118 | REASON | 206 | 85 |
| 119 | RECORD | 125 | 49 |
| 120 | REFER | 106 | 27 |
| 121 | REFLECT | 68 | 29 |
| 122 | RELATION | 196 | 33 |
| 123 | RELEVANCE | 54 | 28 |
| 124 | REQUIRE | 278 | 82 |
| 125 | RESEARCH | 88 | 37 |
| 126 | RISK | 68 | 27 |
| 127 | SCHOOL | 402 | 37 |
| 128 | SECTION | 139 | 33 |
| 129 | SEEM | 273 | 29 |
| 130 | SENSE | 100 | 28 |
| 131 | SEVERAL | 129 | 38 |
| 132 | SHAPE | 55 | 29 |
| 133 | SHOULD | 328 | 43 |
| 134 | SIDE | 118 | 64 |
| 135 | SIMPLE | 156 | 70 |
| 136 | SPACE | 68 | 32 |
| 137 | SPECIFY | 105 | 34 |
| 138 | STAGE | 117 | 27 |
| 139 | STILL | 189 | 66 |
| 140 | STRONG | 91 | 31 |
| 141 | STRUCTURE | 173 | 46 |
| 142 | SUPPORT | 139 | 39 |
| 143 | TEMPERATURE | 115 | 60 |
| 144 | TERM | 257 | 91 |
| 145 | TEST | 309 | 46 |
| 146 | THEREFORE | 154 | 91 |
| 147 | THINK | 93 | 43 |
| 148 | TOO | 145 | 54 |
| 149 | TOWARD | 72 | 31 |
| 150 | TRUE | 74 | 30 |
| 151 | UNTIL | 99 | 49 |
| 152 | USUAL | 170 | 52 |
| 153 | VERY | 326 | 96 |
| 154 | VIEW | 167 | 67 |
| 155 | WATER | 187 | 56 |
| 156 | WELL | 284 | 102 |
| 157 | WHERE | 399 | 152 |
| 158 | WHOLE | 169 | 34 |
| 159 | WIDE | 126 | 32 |
| 160 | WITHIN | 182 | 41 |
| 161 | WITHOUT | 196 | 78 |
| 162 | WOMAN | 228 | 47 |
| 163 | WORD | 239 | 39 |
| 164 | WRITE | 199 | 41 |
| 165 | YET | 107 | 33 |
| 166 | YOUNG | 145 | 37 |

From the most frequent 100 words, we can find 34 words which occur much more frequently in Ecocorp than in Acacorp. Much more frequently means that they occur in one corpus with at least seven times the frequency of their occurrence in the other corpus. Table 5.3 lists these 34 words. The total difference in their frequency of occurrence accounts for 32,214 tokens which equal 10.91% of the tokens in Ecocorp. In Acacorp (Table 5.2), only 3 words occur much more frequently than in Ecocorp (*school*, *seem*, and *should*). The 34 words in Table 5.3 include some of the technical words used in economics, even though they also occur in general English or academic English. The cut-off point of seven times the frequency or more in one corpus was chosen by comparing the frequency differences between the high-frequency items in the two corpora and seeing where the level of frequency difference resulted in there being almost no items occurring more frequently in Acacorp, but several more frequently in Ecocorp. The 10.91% difference in coverage figure for the 34 Ecocorp items shows the significant effect the specialized use of these items has in the text. Note the occurrence of *you* in the list. This indicates that the type of discourse in a continuous text influences vocabulary frequency.

Table 5.3 The 34 overlapping word-families occurring in the most frequent 100 content words of Ecocorp where the frequency of occurrence of the word is seven times or more the frequency of its occurrence in Acacorp

| No. | Word family | Frequency in Ecocorp | Frequency in Acacorp | Difference |
| --- | --- | --- | --- | --- |
| 1 | PRICE | 3080 | 90 | 2990 |
| 2 | COST | 2251 | 91 | 2160 |
| 3 | DEMAND | 1944 | 102 | 1842 |
| 4 | CURVE | 1804 | 83 | 1721 |
| 5 | FIRM | 1743 | 41 | 1702 |
| 6 | SUPPLY | 1590 | 86 | 1504 |
| 7 | QUANTITY | 1467 | 53 | 1414 |
| 8 | MARGIN | 1427 | 24 | 1403 |
| 9 | ECONOMY | 1353 | 172 | 1181 |
| 10 | INCOME | 1183 | 96 | 1087 |
| 11 | PRODUCE | 1237 | 167 | 1070 |
| 12 | MARKET | 1104 | 110 | 994 |
| 13 | CONSUME | 955 | 70 | 885 |
| 14 | LABOUR | 1004 | 131 | 873 |
| 15 | CAPITAL | 907 | 50 | 857 |
| 16 | TOTAL | 946 | 114 | 832 |
| 17 | OUTPUT | 861 | 50 | 811 |
| 18 | REVENUE | 763 | 10 | 753 |
| 19 | YOU | 866 | 118 | 748 |
| 20 | PROFIT | 733 | 27 | 706 |
| 21 | PRODUCTION | 772 | 84 | 688 |
| 22 | AVERAGE | 777 | 90 | 687 |
| 23 | GOODS | 705 | 21 | 684 |
| 24 | PRODUCT | 749 | 106 | 643 |
| 25 | TRADE | 621 | 85 | 536 |
| 26 | BUY | 521 | 35 | 486 |
| 27 | WAGE | 522 | 75 | 477 |
| 28 | MONOPOLY | 454 | 13 | 441 |
| 29 | PERCENT | 450 | 41 | 409 |
| 30 | MILLION | 445 | 42 | 403 |
| 31 | HOUSEHOLD | 360 | 41 | 319 |
| 32 | EQUILIBRIUM | 328 | 21 | 309 |
| 33 | CHOICE | 339 | 39 | 300 |
| 34 | ELASTICITY | 333 | 34 | 299 |
| Total |  |  |  | 32,214 |

* 1. What is the Collocational Behavior of Three Words in Both the Economics and Academic Texts?

The previous section looked at using difference in frequency of occurrence as a way of determining what technical words were. This will be looked at further in the following chapter. This section looks at collocation as a way of doing this. It compares the behavior of three high-frequency words in Ecocorp and Acacorp.

It examines a word—*price*—that is very frequent in both Ecocorp and Acacorp, but which has the statistical features of a technical word in that it is of extremely high frequency in the specialized corpus, Ecocorp. The purpose of the comparison is to see if its high occurrence in the specialized corpus is reflected by having a specialized group of collocates.

The next words examined are *increase* and *measure*. These words occur with similar ranks in the frequency lists of Ecocorp and Acacorp. The purpose of the comparison is to see if the similarity of rank hides a different set of collocations.

* + 1. The Collocations of *Price*

*Price* is one of the most frequent words in Ecocorp. It occurs 3080 times and is in the 10 most frequent words. In Acacorp, even though the word belongs in the first 500-word level, this word has a much lower frequency of occurrence. It occurs 92 times in Acacorp. Table 5.4 shows that the stem *price* occurs most frequently in both corpora, followed by *prices* and *pricing*. The data show that the word *price* is used in Ecocorp mainly as a noun preceded by adjectives and adjectival nouns. There was only one verb occurrence, namely *priced* (Table 5.5), as in ‘*With players typically priced at $1,000 and discs selling for more than $20, sales did begin as a trickle*’(Parkin, 1990: 92).

Table 5.4 The number of forms of the lemma *price* occurring in Ecocorp and Acacorp

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| Type | Ecocorp | | Acacorp | |
| Occurrences | % | Occurrences | % |
| price | 2364 | 83.64 | 54 | 58.70 |
| priced | 1 | 0.03 | - | - |
| prices | 484 | 15.36 | 34 | 36.96 |
| pricing | 30 | 2.09 | 4 | 4.34 |
| Total | 3149 | 100.00 | 92 | 100.00 |

In Acacorp, 63 occurrences of *price* (68.48%) are used as nouns in the text including the present participle *–ing* as in *competitive pricing*. The remaining 29 items (31.52%) out of the total 92 tokens function as adjectives including three *–ing* items: *pricing decision*, *pricing power*, and *pricing controls*.

Table 5.5 The grammatical functions of *price* in Ecocorp and Acacorp

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| Part of Speech | Ecocorp | | Acacorp | |
| Total | % | Total | % |
| Nouns | 2856 | 90.70 | 63 | 68.48 |
| Verbs | 1 | 0.03 | - | - |
| Adjectives | 292 | 9.27 | 29 | 31.52 |
| Total | 3149 | 100.00 | 92 | 100.00 |

Right-Hand Collocations

Table 5.6 contains those words which immediately follow *price* in Ecocorp and Acacorp. This shows that *price* in Ecocorp is mostly used in noun phrases such as *the price of soda*, *the prices of goods*, *the price of movies*, etc.

Table 5.6 The rank order of right-hand collocations with *price*

| Collocate | Tokens | |
| --- | --- | --- |
| Ecocorp | Acacorp |
| price/s of | 753 | 9 |
| price is | 186 | - |
| price/s change/s | 77 | 2 |
| price/s and quantity/ies | 69 | - |
| price discrimination | 67 | - |
| price rise/s (11/55) | 66 | - |
| price fall/ing/s (6/1/49) | 56 | - |
| price and the quantity | 49 | - |
| price at which | 38 | - |
| price for | 36 | - |
| price elasticity(ies) | 35 | - |
| price monopoly | 35 | - |
| price increase/s (7/26) | 33 | - |
| price will/would (23/8) | 31 | - |
| price discriminate/s/ing (22/5/3) | 30 | - |
| price elasticity of demand | 30 | - |
| price to | 30 | - |
| price equal | 27 | - |
| price on | 16 | - |
| price-earning/s ratio (1/15) | 16 | - |
| price change/s/d (11/1/4) (verbs) | 16 | - |
| pricing rule | 15 | - |
| price in | 15 | - |
| price and output | 15 | - |
| price taker/s (13/2) | 15 | - |
| price war/s (3/12) | 15 | - |
| price determination | 14 | 2 |
| price fluctuations | 11 | - |
| price effect | 10 | - |
| price varies | 10 | - |
| price and income/s (5/5) | 10 | - |
| price control/s (5/6) | - | 11 |
| price level | - | 7 |
| price variable | - | 2 |

The figures in brackets show the number of tokens for each collocates, e.g. *price rise* occurs 11 times and *price rises* occurs 55 times making a total of 66 occurrences. The collocation *is* indicates that the word *price* is used as a noun functioning as a subject. The words that follow this construction are mostly items like *bushel*, *tape*, *great*, *high*, *low*, *above*, *below*, etc., as in *price is $3 a bushel*, *price is $3 a tape*, *price is high*, etc. The word *is* also occurs in passive constructions frequently followed by verbs such as *reached*, *regulated*, *determined*, *shown*, etc., in sentences like *price is determined by actual supply and demand*. In this case, *determined* has the highest occurrence (8).

So far we have looked mainly at immediate collocations. Let us now look at those occurring within a 5-word span to the right of *price* (N+1 to N+5). The frequencies of the words, for example *change*, *quantity*, *fall*, *increase*, are 77, 69, 56, 33, respectively in Table 5.6, but in Table 5.7, which considers a wider span, their frequencies increase to 83, 151, 78, and 53. The words *goods*, *tape*, and *movies*, which occur with less than 10 occurrences, also occur much more frequently after *price* in the wider span, i.e. 121, 57, and 39 times. Here are some examples of their use:

* *prices are influenced by technological change*
* *the price and quantity traded in a market*
* *the price and the quantity of train*
* *the prices of goods and services*
* *a price of $3 a tape*
* *The price of movies*
* etc.

It was found that only a very few content words in Acacorp collocate significantly with *price*, both before and after the node. Table 5.6 shows that there are only 5 content words in Acacorp which occur after *price* with the frequency of between 2 – 11 occurrences, namely *control*, *level*, *determination*, *changes*, and *variable*, for example:

* *these inputs have in the past suffered price control,*
* *demand affects the general consumer price level in our system.*
* *a moving average of price changes is taken.*
* *As they introduced longer lags in the price variable,*

Table 5.7 The rank order of collocation of *price* in span positions N+1 to N+5 in Ecocorp where each collocate occurs in more than one position

| **Collocate** | **Tokens** | **Collocate** | **Tokens** |
| --- | --- | --- | --- |
| quantity/ies | 151 | traded | 30 |
| good (s) | 121 | labour | 29 |
| change (s) | 83 | capital | 26 |
| fall (s) | 78 | substitute | 23 |
| discrimination | 67 | soda | 21 |
| tape/s | 57 | determination | 21 |
| increase | 53 | income | 19 |
| demand/demanded | 40 | output | 19 |
| monopoly | 39 | bushel | 18 |
| movies | 39 | cost | 18 |
| discriminate | 34 | complement | 17 |
| resources | 32 | marginal | 12 |
| equal | 31 | sold (sell) | 10 |

Left-Hand Collocations

The highest-frequency content word occurring before *price* is *high* with its comparative *higher* and superlative *highest*. This word is typical of economics vocabulary. *Low* is also a frequent collocate.

* *For any resource, there is a high price at which it does not pay anyone to use the resource.*
* *Why does a higher price lead to a greater quantity supplied of a good?*
* *What is the highest price that the consumers are willing to pay?*
* *When the demand is higher than expected, the price turns out to be higher that it was forecasted to be.*
* *When the demand is lower than expected, the price turns out to be lower than it was forecasted to be.*

Table 5.8 The rank order of left-hand collocations with *price*

| Collocate | Tokens | |
| --- | --- | --- |
| Ecocorp | Acacorp |
| (the price) | 1015 | 17 |
| if the price | 106 | - |
| a high/er/st price/s | 97 | 7 |
| its price | 96 | - |
| when the price | 86 | - |
| at a price | 83 | - |
| a change/s in price(s) | 78 | - |
| market price/s (68/7) | 75 | - |
| factor price/s (33/27) | 60 | - |
| low/lower/est price | 57 | 3 |
| equilibrium price | 45 | - |
| single-price | 44 | - |
| future price/s (29/14) | 43 | - |
| change/s in the price | 39 | - |
| relative price | 37 | - |
| as the price | 32 | - |
| input prices | 30 | - |
| on price/s (10/7) | 27 | - |
| a fall in the price | 26 | - |
| each price | 24 | - |
| to price | 23 | - |
| cost pricing | 22 | - |
| the maximum price | 22 | - |
| at that price | 22 | - |
| (the) actual price | 22 | - |
| perfect price | 20 | - |
| by the price | 19 | - |
| the choke price | 19 | - |
| rise in price | 19 | - |
| equals price | 18 | - |
| lower/d/ing/s the price (v)(5/5/6) | 16 | - |
| percentage change in price | 16 | - |
| the higher the price | 15 | - |
| rise in the price | 15 | - |
| asset prices | 14 | - |
| increase in the price | 14 | - |
| a/each different price (9/5) | 14 | - |
| determine/d/s the price (8/1/5) | 14 | - |
| raise/s/ing the price (3/6/5) | 14 | - |
| expected price | 13 | - |
| the industry price | 12 | - |
| average price | 12 | - |
| given price | 12 | - |
| and price | - | 6 |
| wage and price | - | 3 |

Table 5.8 shows the comparison of left-hand collocates of *price* in both corpora. We can see that Ecocorp has a considerable number of collocates listed from a frequency of 11 and above. Some of the lower-frequency collocates occurring before *price* are not included here such as *if*, *fall*, *possible*, *lower*, *stock*, etc., with a frequency of 10. Note that there are only two content words—*high* and *wage*—which are frequent left collocates in Acacorp.

Table 5.9 lists recurring content-word collocates in a wider span position in Ecocorp. The words *high*, *low*, *market*, *factor*, and *equilibrium*, are still among the most frequent collocates. The collocates *monopoly*, *supply*, and *margin*, are very-frequent left collocates in different span positions. No high-frequency content-word collocates were found in Acacorp.

Table 5.9 The rank order of the collocations of *price* in span positions N-1 and N-5 in Ecocorp where each collocate occurs in more than one position

| Collocate | Token | Collocate | Token |
| --- | --- | --- | --- |
| high (er/est) | 132 | average | 22 |
| low (er/est) | 97 | expected | 22 |
| market | 75 | raise | 21 |
| factor | 60 | cost | 20 |
| equilibrium | 45 | divided | 16 |
| single | 44 | given | 15 |
| future | 43 | asset | 14 |
| each | 42 | monopoly | 14 |
| relative | 41 | supply/ied | 13 |
| equal | 36 | marginal | 12 |
| quantity | 24 | small | 11 |
| actual | 22 | possible | 10 |

Comparing the collocations of *price* in Ecocorp and Acacorp, the similar most-frequent collocates are *of* and *change* in the right-hand collocations, and *the*, *high* and *low* in the left-hand collocations. Altogether, there are 9 words in the left and 4 in the right collocation in both corpora:

left : *falling*, *high*, *increase*, *market*, *oil*, *rising*, *set*, *when*, *which*

right : *change*, *determination*, *increase*, *variable*

The difficulty in comparing *price* in the two corpora is the widely differing frequency. What is clear is that although there are function and collocation differences, there is little in the use of *price* in Acacorp that is not in Ecocorp. In spite of the frequency difference, their use is similar.

* + 1. The Collocations of *Increase*

The word *increase* is the hundredth most frequent word in both Ecocorp and Acacorp. In the two corpora, the frequency of occurrence is different, 991 tokens in Ecocorp and 260 tokens in Acacorp. Like most other content words, this word appears with its derived forms serving a variety of functions. Table 5.10 shows the number of word-forms appearing in Ecocorp and Acacorp.

Table 5.10 The number of forms of the lemma *increase* occurring in Ecocorp and Acacorp

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| Type | Ecocorp | | Acacorp | |
| Occurrences | % | Occurrences | % |
| increase | 402 | 40.57 | 97 | 37.31 |
| increased | 112 | 11.30 | 70 | 26.92 |
| increases | 364 | 36.37 | 33 | 12.69 |
| increasing | 113 | 11.4 | 60 | 23.08 |
| Total | 991 | 100.00 | 260 | 100.00 |

Table 5.11 shows the proportions of functions of *increase* in Ecocorp and Acacorp. In Ecocorp it was found that of the 991 occurrence, 713 items (71.95%) functioned as nouns, 621 of which were in the base-form *increase*, and 92 items were in the *–ing* form or gerund *increasing*.

The second rank after nouns is verbs. The verb *increase* occurs 241 times in Ecocorp or 24.32% of the total tokens. This consists of 229 base-forms and *–ed* forms and 12 *–ing* forms.

* *average product is increasing*
* *white workers were increasing dramatically*
* *if the demand had increased slightly more than shown*
* *The price has increased from*
* *its own budget should be increased*
* etc.

Table 5.11 The grammatical functions of *increase* in Ecocorp and Acacorp

|  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- |
| Part of speech | Tokens | | Tokens (*–ing*) | | Ecocorp | | Acacorp | |
| Eco | Aca | Eco | Aca | Total | % | Total | % |
| Adjectives | 28 | 17 | 9 | 36 | 37 | 3.73 | 53 | 20.38 |
| Verbs | 229 | 54 | 12 | 9 | 241 | 24.32 | 63 | 24.23 |
| Nouns | 621 | 129 | 92 | 15 | 713 | 71.95 | 144 | 55.39 |
| Total |  | | | | 991 | 100 | 260 | 100 |

*Increase* as an adjective consists of the *–ed* form and *–ing* form, *increased* (28 items) and *increasing* (9 items). The proportion of this type is very low, only 3.73%, that is only 37 items out of the total 991 items. See the following examples:

* *to an increased amount of radiation*
* *Increased rural incomes brought an expanding rural industrial sector*
* *the increased quantity sold results in revenue gain*
* *An increasing number of households are choosing the egalitarian*

*Increase* in Acacorp occurs 260 times in the collocational list. Table 5.11 shows the frequency of parts of speech in the list. As in Ecocorp, the samples are dominated by nouns comprising 144 items (55.39%), out of the 260 samples. This includes 129 base-forms*increase*, and 15 *–ing* forms *increasing*. However, this proportion is not as high as that in Ecocorp. The proportions of adjectives and adverbs in Acacorp, unlike those in Ecocorp, are almost the same, 20.38% (53 items) and 24.23% (63 items). The adjectives consist of 17 *–ed* forms and 36 *–ing* forms. These words are used to modify nouns, e.g.:

* *There is an increased liability to the development of diabetes.*
* *They also noted the increasing number of rolled coral in the upper beds*

The verbs consist of 54 base-forms and 9 *–ing* forms.

Left Collocations

Table 5.12 shows the rank-order list of immediate left-hand collocations of *increase* in Ecocorp and Acacorp with their occurrences ranging from 9 to 46 in Ecocorp and 8 to 16 in Acacorp. It also shows that three function words dominate the top rank list in Ecocorp, *to* (infinitive), *have*, and *the* with frequencies of occurrence of 46, 32, and 31. Among the top content words, *price* and *income* are included, with 35 and 30 occurrences (see Table 5.12). This indicates that the word *increase* appears mostly as a noun or a verb in both corpora (see Table 5.12). Most of the verbs *increase* are marked by the infinitive *to*. Another verb marker is *have* with its inflected forms, *has* and *had*.

The next most frequent collocates preceding *increase* in Ecocorp are content words—*supply*, *output*, *percentage*, and *unit*—with frequencies of occurrence of 24, 16, 14, 13, and 13, whilst the verb *lead* occurs 16 times before *increase* in span position N-3 as in *to lead to an increase*.

Table 5.12 The rank-order list of immediate left-hand collocations with *increase* in Ecocorp and Acacorp

|  |  |  |
| --- | --- | --- |
| Collocate | Tokens | |
| Ecocorp | Acacorp |
| to increase | 46 | 15 |
| price/s increase/s (9/26) | 35 | - |
| have increased | 32 | 8 |
| the increase | 31 | 11 |
| income increase/s (3/27) | 30 | - |
| (an increase) | 27 | 15 |
| supply increases/ied (14/10) | 24 | - |
| leads /ing to an increase in (8/8) | 16 | - |
| output increases | 14 | - |
| percentage increase in | 13 | - |
| one-unit increase in | 13 | - |
| can/could increase (11/1) | 12 | - |
| result/s in an increase in (2/9) | 11 | - |
| rate increases | 11 | - |
| and increases | 10 | - |
| a/the large increase (8/1) | 9 | - |
| will increase | 9 | - |
| the quantity traded increases | 9 | - |
| rate/s of increase (1/15) | - | 16 |
| with increasing | - | 10 |
| an increased (price, tendency, etc.) | - | 9 |
| the increasing | - | 8 |

The following are some sentences exemplifying these collocates in Ecocorp:

* *When incomes increase, consumers demand more of most goods.*
* *When the price increases, the quantity supplied increases.*
* *Total cost (TC) increases as output increases.*
* *when the percentage increase in output exceeds the percentage increase in input*
* *the change in total product resulting from a one-unit increase in the variable input.*

(Note that the collocates before *increase* like this occur many times in the list)

Table 5.13 lists content words which occur 6 – 42 times in span positions N-1 to N-5 before *increase* in Ecocorp.

Table 5.13 The rank-order list of collocations with *increase* in span positions N-1 to N-5 in Ecocorp where each collocate occurs in more than one position

|  |  |
| --- | --- |
| Collocate | Tokens |
| price | 42 |
| income | 32 |
| supply | 32 |
| result /ing | 28 |
| quantity | 21 |
| unit |  |
| (one-unit; per unit) | 21 |
| demand/ed | 18 |
| can (could) | 12 |
| wage/s | 11 |
| steady | 10 |
| traded | 10 |
| large | 9 |
| cost | 8 |
| capital | 8 |
| factor | 8 |
| labour | 8 |
| movies | 6 |

In Acacorp, *increase* occurs less frequently. The patterns of collocation do not show many variations in both left and right collocations. Table 5.12 also identifies the eight highest-frequency left collocates with a frequency of 8 and above. The word *rate* occurs 16 times in span position N-2, e.g. *rate of increase*. This is the only content word occurring significantly before *increase* found in Acacorp. In Ecocorp, *rate* occurs 13 times in two different span positions, *rate of increase* (nouns)—two times—and *rate increases* (verbs)—eleven times.

The left-hand collocations with *increase* in both corpora show a great difference. Ecocorp has a greater number of collocates with higher occurrences than Acacorp. Many content words were found, such as *price*, *supply*, *lead*, *percentage*, etc. In Acacorp, there is only one word—*rate*—as the most frequent content-word collocate and it is the only collocate occurring before *increase* in both corpora. Some of the immediate collocates in Ecocorp occur more frequently in span positions N-1 to N-5 with some additional content words. This, in fact, does not happen in Acacorp.

Right-Hand Collocations of Increase

Table 5.14 shows that there were a small number of collocations of content words occurring after *increase* in span position N+1.

Table 5.14 The rank-order list of immediate right-hand collocations with increase in Ecocorp and Acacorp with a frequency of 5 or more

|  |  |  |
| --- | --- | --- |
| Collocate | Tokens | |
| Ecocorp | Acacorp |
| increase/s in | 224 | 61 |
| increase/s from | 33 | - |
| increase in the quantity | 31 | - |
| increase in demand | 30 | - |
| increases to | 21 | - |
| increase in the price/s of | 14 | - |
| increase their | 14 | - |
| increase in supply | 14 | - |
| increases as | 12 | - |
| increase output | 11 | - |
| increases the quantity | 11 | - |
| increases, the quantity | 11 | - |
| increase in the demand for | 10 | - |
| increases its | 10 | - |
| increase/ing of | - | 10 |
| increased by | - | 7 |
| increase with | - | 5 |

The following are examples of phrases containing some of those collocates in Ecocorp:

* *When labour increases from 1 to 2 workers*
* *The increase in the quantity demanded of coal would result*
* *An increase in demand for the industry’s production shifts the demand*
* *When supply increases to 18 billion bushels and the price falls to*
* *An increase in the price of hamburgers will produce*
* *The increase in supply lowers the price of tapes by*

Table 5.15 The rank-order list of collocations of *increase* in span positions N+1 to N+5 in Ecocorp and Acacorp where each collocates occurs in more than one position

| Collocate | Tokens | |
| --- | --- | --- |
| Ecocorp | Acacorp |
| quantity | 69 | - |
| demand /ed (59/10) | 69 | - |
| price | 40 | - |
| supply | 27 | - |
| consumption | 14 | - |
| income | 12 | - |
| inputs | 10 | - |
| revenue | 10 | - |
| production | 8 | - |
| product | 6 | - |
| cost | 5 | - |
| crime | - | 7 |

Table 5.15 lists the content words which occur in span positions N+1 to N+5. The right collocations of *increase* in Acacorp consist of structural words such as *in*, *of*, *by*, and *with*. *In* and *of* dominate the occurrences, 61 and 10 times (see Table 5.14). There are only two words which occur frequently in span positions N+1 to N+5 in Acacorp, i.e. *in* (61 times) and *crime* (7 times). Thus, *crime* is the most important content word in Acacorp occurring in different span positions after *increase* (Table 5.15).

Comparing the collocations of *increase* in both Ecocorp and Acacorp, the former still shows many variations of collocational patterns compared with the latter. However, there are some words found to be the same collocates in Ecocorp and Acacorp with a low frequency of occurrence. Unlike Acacorp, there are some content words found in the right-hand collocations with *increase* in Ecocorp, such as *quantity*, *demand*, *price*, *supply*, *output*, *revenue*, etc. In Acacorp, no significant collocation of content words was found. The frequent collocates are function words. *In* is a common collocate occurring after *increase* in both corpora, and *to*, *have*, and *the* are the most frequent left-hand collocates in both corpora. There is no similar frequent content-word collocate in both Ecocorp and Acacorp. What is clear is that Ecocorp has much richer collocates compared with Acacorp, but this is partly a result of the greater number of occurrences of *increase* in Ecocorp.

* + 1. The Collocations of *Measure*

*Measure* is found in the first 500-word level of both Ecocorp and Acacorp. This lemma occurs 269 times in Ecocorp and 240 times in Acacorp. In collocation data, there are 267 instances in Ecocorp and 239 instances in Acacorp (see Table 5.16). Some of them occur as collocates in very wide span positions in the collocation data that are not counted as nodes.

*Measure* in Ecocorp is mostly used as a verb, including the passive voice. Table 5.17 shows that 71.91% (192 items) of the occurrences of *measure* are verbs. Another 26.97% (72 items) are nouns. This includes two word-forms: *measure* and *measurement*. Adjective use is the least frequent with only 1.12% (3 items) and all are *–ed* forms. These are some examples:

Verbs : *the price* ***is measured*** *by the distance from*

*Accountants and economists* ***measure*** *cost in different ways.*

Nouns : *Any units of* ***measure*** *consistently applied will do.*

*Elasticity is a units-free* ***measure*** *of response.*

Adjectives : *The* ***measured*** *distribution of wealth exaggerates the degree of*

Table 5.16 The number of forms of the lemma *measure* in Ecocorp and Acacorp

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| Word-forms | Ecocorp | | Acacorp | |
| Occurrences | % | Occurrences | % |
| measure | 75 | 28.09 | 60 | 25.11 |
| measured | 80 | 29.96 | 67 | 28.03 |
| measurement/s | 13 | 4.87 | 74 | 30.96 |
| measures | 77 | 28.84 | 20 | 8.37 |
| measuring | 22 | 8.24 | 18 | 7.53 |
| Total | 267 | 100.00 | 239 | 100.00 |

Table 5.17 The grammatical functions of *measure* in Ecocorp and Acacorp

|  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- |
| Part of speech | Tokens | | Tokens (*–ing*) | | Ecocorp | | Acacorp | |
| Eco | Aca | Eco | Aca | Total | % | Total | % |
| Adjectives | 3 | 12 | - | 5 | 3 | 1.12 | 17 | 6.83 |
| Verbs | 191 | 85 | 1 | - | 192 | 71.91 | 85 | 34.13 |
| Nouns | 51 | 124 | 21 | 13 | 72 | 26.97 | 147 | 59.04 |
| Total |  | | | | 267 | 100 | 249 | 100 |

Acacorp has a different proportion of each part of speech. The word *measure* mostly functions as a noun in the corpus. This includes the base-form *measure* (49 times), *measurement/s* (74 times), and *measuring* (13 times). *Measure* occurs 85 times as a verb and 17 times as an adjective consisting of 12 *–ed* forms and 5 *–ing* forms (see Table 5.17).

Left-Hand Collocations of Measure

Table 5.18 lists the rank order of the collocations of *measure* in Ecocorp and Acacorp. It shows that the three most frequent collocates are *be* (*are*, *is*, *be*, *being*), *to*, and *we*, with frequencies of 37, 15, and 10 times in Ecocorp. This also shows that the word *measure* is commonly used as a verb in which the passive voice dominates the collocational patterns.

Table 5.18 The rank order of immediate left-hand collocations with *measure* in Ecocorp and Acacorp

| Collocate | Tokens | |
| --- | --- | --- |
| Ecocorp | Acacorp |
| are/is/be/being measured | 37 | 24 |
| to measure | 15 | 16 |
| we measure | 10 | - |
| the vertical axis measures | 9 | - |
| cost measures | 8 | - |
| unit/s of measurement (1/6) | 7 | - |
| a measure | 6 | 10 |
| the horizontal axis measures | 6 | - |
| length and measurement | - | 6 |
| of measurement | - | 5 |

The word *axis* occurs quite frequently before *measure*, 9 times with *vertical*—as in *The vertical axis measures the interest rate*—and 6 times with *horizontal*—as in *The horizontal axis measures the total quantity of the capital*. These words are used to explain graphs.

The same collocates occur in Acacorp in which most of the collocates preceding *measure* are *be* (24 times) as a passive marker—as in *be measured*, *was*/*were measured*—and the infinitive marker *to* (16 times). The only content word that precedes *measure*, which shows significant collocation in Acacorp, is *length* (6 times), as in *the development of concepts relating to length and measurement* (see Table 5.18).

There are four words in Ecocorp which occur frequently before *measure* in a range of span positions from N-1 to N-5. *Axis* (19 times) is the most frequent one, which is followed by *we* (15 times), *unit* (9 times), and *accountant* (5 times).

In the left-hand collocations with *measure*, we can find a common thing in both corpora in that most of the immediate collocates are dominated by function words. *Be* with its derivative forms and *to* are the most frequent collocates occurring before *measure* in both Ecocorp and Acacorp. *Be* is mostly used in both corpora as a passive agent. In Ecocorp there are some content words occurring several times before *measure* while there is only one in Acacorp and it is not in the Ecocorp list of collocates.

Right-Hand Collocations of Measure

Basically, both Ecocorp and Acacorp show a similar pattern of collocations of *measure* in that most of the immediate collocates following *measure* are function words. The word *were* is used in passive constructions, as in *measurements were made* (see Table 5.19). In Ecocorp, the most frequent words are *of*, *on*, *by*, *in*, and *the*, with a frequency of occurrence of 22, 20, 17, 13, and 10. The other collocates occur less than 10 times in such phrases as *on the horizontal axis* and *opportunity cost*. In fact, the words like *axis*, *cost*, and *horizontal* occur many times after *measure* in Ecocorp in span positions N+1 to N+4—20, 10, and 9 times.

Table 5.19 The rank-order list of immediate right-hand collocations with *measure* in Ecocorp and Acacorp

|  |  |  |
| --- | --- | --- |
| Collocate | Tokens | |
| Ecocorp | Acacorp |
| measure/ment(s) of | 22 | 40 |
| measured on | 20 | - |
| measured by | 17 | 14 |
| measured in | 13 | 13 |
| measure(s) the | 10 | 16 |
| measured on the horizontal axis | 9 | - |
| measure opportunity cost | 8 | - |
| measured as | 6 | - |
| measures the marginal | 5 | - |
| measures the responsiveness of | 5 | - |
| measurements were made | - | 7 |

In Acacorp, only one content word occurs frequently in span positions N+1 to N+5: *experiments* (4 times) (see Table 5.20).

Table 5.20 The rank-order list of content-word collocates occurring after *measure* in Ecocorp and Acacorp in span positions N+1 to N+5 where each collocate occurs in more than one position

|  |  |  |
| --- | --- | --- |
| Collocate | Tokens | |
| Ecocorp | Acacorp |
| axis | 20 | - |
| cost | 10 | - |
| horizontal | 9 | - |
| quantity | 5 | - |
| marginal | 5 | - |
| average | 4 | - |
| distance | 2 | - |
| experiments | - | 4 |

Unlike Acacorp, Ecocorp has many content words recurring in span positions N+1 to N+5. There is no similar high-frequency content-word collocate found in both Ecocorp and Acacorp.

The use of *measure* with function words in both corpora is basically the same (see Tables 5.18 and 5.19). In the left-hand collocations, similar frequent collocates were found, namely *be* with its derivative forms used in passive constructions and the infinitive *to*. In the right-hand collocations, the collocates *of*, *by*, *in*, and *the* occur in both corpora.

The difference in the richness of collocations in both corpora is simply due to the difference in the text types of both corpora. Being a text on one topic, Ecocorp has more opportunity for significant collocations to be repeated. The chance for the same collocates to occur frequently is greater than in Acacorp. Acacorp, consisting of many different texts, has a smaller chance for its collocates to occur repeatedly. There are very few collocates in Acacorp which do not occur in Ecocorp. However, only a small number of collocates occur very frequently in both corpora.

* 1. What are the Distinguishing Characteristics of Non-Overlapping Words in Economics Text?

Another purpose of this study is to look at the words which do not overlap in Ecocorp and Acacorp, i.e. the words which occur only in Ecocorp. We will now look at the first three 500-word levels of Ecocorp which contain 15, 47, and 84 words not in Acacorp (see Table 4.7).

* + 1. Words in the First 500-Word Level and not in Acacorp

Looking at the data in Table 4.7, we can find the number of the words which do not occur in Acacorp within every 500-word level of Ecocorp. In the first group of high-frequency words of Ecocorp (1st 500-word level), 15 out of 500 words do not occur anywhere in Acacorp. These words can be classified into three categories: **examples**, **technical words**, and **general words**. **Examples** here means a group of words which are used by the writer to describe economics phenomena in the text, such as examples of products and services or the names of the people involved in economic activity. **Technical words** are special terms used in economics. The other is a group of words which seem to be **general words**.

Table 5.21 shows the distribution of words from the first and the second 500-word levels of Ecocorp which are not in Acacorp. In the first 500-word level, most of the words are in the first category (10 items). *Bushel*, *sweater*, *knit*, *haircut*, *Swanky*, *six-pack*, *Jane*, *Lisa*, *Pioneer land*, and *United States* are frequently used in the text to show the examples of economic activity. *Bushel*, *sweater*, *knit*, and *six-pack* are examples of products; *haircut* is an example of a service provided by a person; *Pioneer land* is an imaginary country; *Jane*, *Lisa*, and *United States* are the names of people and places commonly used in examples; and *Swanky* is an example of a firm. Some examples of these are given below:

* *two billion bushels are taken into inventory*
* *knitting machine*
* *The money you spent on haircuts*
* *drinking 4 six-packs of soda*
* *by studying Swanky’s economic problem*
* *Pioneer land (a fictitious country) can produce grain and cars*
* *the people of Pioneer land*

Table 5.21 The distribution of words from the first and second 500-word levels of Ecocorp and not in Acacorp

|  |  |  |
| --- | --- | --- |
| Category | 1st 500-word level | 2nd 500-word level |
| Examples | bushel, Swanky, haircut, sweater, Jane, United States, knit, Lisa, six-pack, Pioneer land | Bob, Bobbie, cream, nepool, popcorn, walkman, gasoline, barrel, gallon, switchgear, Max, Jenny, ALF, Joe, Lee, Loren Stevens, ATC, TV |
| Technical Words | isocost, isoquant, short-run, utility, indifference | antitrust, deadweight, duopoly, leastcost, lows, nonmarket, oligopoly, payoff, profit-maximizing, proprietorship, salesperson, scarcity, single-price, socialism, stockholder |
| General Words |  | affordable, collusive, defense, differential, emphasize, eventual, luck, physical, potential, rational, shirk, socialist, steady, trillion |

In the second group we can find only five words which are technical terms used in economics: *isocost*, *isoquant*, *short-run*, *utility*, and *indifference*. *Indifference* seems to be a general word, but this word has a special use in economics, as in *indifference curve* which means a line showing all possible combinations of two goods among which the consumer is indifferent. It is not surprising that this word does not occur in Acacorp. In the general-words category, no word was found.

* + 1. Words in the Second 500-Word Level and not in Acacorp

In the second 500 high-frequency words, there are 47 items (9.4%) from Ecocorp which do not occur at all in Acacorp. These items are still considered as important items in Ecocorp because their frequency of occurrence is high, 78 – 26 (Table 4.11). Of the 47 items, most of them consist of nouns, i.e. 36 items (76.60%); 9 items (19.15%) are adjectives and 2 items (4.5%) are verbs. This level also follows the same pattern as in the first 500-word level (Table 5.21). There are 18 items in the examples category, 15 items in the technical category, and another 14 items as general words. The words in the first category are similar to those in the first 500-word level. We can find words like *nepool* (the name of a company) and *popcorn* and *walkman* (examples of products). Others are mostly the names of people and products and some abbreviations.

The 84 words in the third 500-word level (not listed) are mostly dominated by technical words, like *capital-intensive*, *high-wage*, *end-state*, etc. The examples consist of many abbreviations, such as *AF*, *ARC*, *IBM*, and *ETC*; some are proper nouns—like the names of people and places—and economic commodities (products), such as *Robins*, *Steve*, *Korea*, *Hong Kong*, *automobile*, *bike*, etc.

CHAPTER VI | Conclusion

The purpose of this chapter is to discuss some interpretations of the data presented in Chapters IV and V. It will look at the effects of the different features of both corpora on reading and vocabulary enrichment and the effect on vocabulary load and technical words. Some implications of the study and the value of corpus study are also discussed in this section. At the end of the section, proposed future research is presented.

We have identified the features of Ecocorp and Acacorp. Both corpora have almost the same number of running words. The difference is in the number of writers and the range of topics. Ecocorp consists of one specialized text, one topic—economics—by one writer. Acacorp consists of a series of unrelated texts by many writers. Due to these differences the corpora differ greatly in the number of word-forms and word families. Acacorp has more than twice as many word types and word families as Ecocorp. These differences have of course an effect on the vocabulary load, and especially on conditions for reading and vocabulary learning.

1. 1. How does Reading One Specialized Text Affect the Vocabulary Load Compared with Reading a Series of Separate Texts?

When reading unsimplified texts such as an economics text, learners need to know sufficient different words to achieve successful comprehension. Too many unknown words will affect the learners’ reading comprehension and increase learners’ vocabulary load. The difficulty is great if the unknown words consist of mostly low-frequency words and there are a great number in a text.

Comparing the two corpora, Ecocorp is more favorable as a reading text than Acacorp in that it contains fewer unknown words. Table 4.1 provides clear evidence that Ecocorp has many less word families compared with Acacorp. Tables 4.2 and 4.3 show that Ecocorp has considerably less low-frequency words and more high-frequency words beginning from a frequency of 300. This is one indication that Ecocorp is better for reading. If the words outside the first 2,000 words of the GSL are considered as unknown words, by looking at these words in both corpora, it is estimated that Ecocorp has 3,861 unknown word families (71% of the total word families), and Acacorp 10,853 word families (85.16%). Thus, Acacorp has many more unknown words than Ecocorp.

Some studies (Goodman and Bird, 1984; Hwang and Nation, 1989) show that a single topic has a good effect on reducing the density of unknown word families. In addition, some of the unknown words may appear frequently enough in a long continuous text to be learned and many of them maintain semantic cohesion. The readers will learn their meaning from contextual clues.

When learners read a series of unrelated texts, however, they will encounter a range of topic vocabulary. A collection of these texts has a high density of unknown words (Hwang and Nation, 1989). In some special purpose English classes, such as English for engineering, the learners may be faced with reading one topic type text guided by the teacher. This will help them read the text more easily because there are some repetitions of unknown words in this long continuous text which in turn can reduce the vocabulary burden. While reading outside class they are usually assigned to read a variety of unrelated texts. In this way the learners will meet a wide range of vocabulary which can increase their vocabulary size.

* 1. How does Reading one Specialized Text Affect Vocabulary Repetitions Compared with a Series of Unrelated Texts?

Reading a text can result in vocabulary learning. This means that, besides strengthening the initial vocabulary knowledge, more new words would be acquired by reading the text. In order to achieve this, a text should contain new vocabulary with a reasonable number of repetitions. Repetition of unknown words is important for vocabulary acquisition. A single encounter with an unknown word would seldom lead to a full knowledge of its meaning (Nagy, Herman and Anderson, 1985). Therefore, more repetition is important in order to have adequate learning (Nation and Yamamoto, 2012).

In his review of research on human memory, Baddeley (1990) described the effect of inter-item repetition interval on learning. He refers to Melton (1970) and argues that ‘an individual item will be better learned and recalled if successive presentations of that item are relatively widely separated, even though the interval between presentations is filled with other items’ (p. 156). Thus, spaced repetition will increase the chance that the item will be remembered. The act of successfully recalling an item increases the chance that item will be remembered. This happens because recalling the item leads to better retention than simply presenting it again with its meaning. It appears that the retrieval route to that item is in some way strengthened by being successfully used. Meeting an item again in a reading text involves having to search for the meaning of that item and thus would fit with Baddeley’s description of the recall requirement for learning from repetition.

Ecocorp, being a text on one topic, has a greater number of very-high-frequency words and a smaller number of low-frequency words than the collection of texts that make up Acacorp. Table 4.2 shows that the number of words with a frequency of 5 or more in Acacorp is more than twice as many as those in Ecocorp. Table 4.3 shows that the figures still maintain this tendency up to a frequency of 300. Looking from this point of view, Acacorp is better in terms of vocabulary learning and also provides better coverage of the words in the base lists. The greater number of high-frequency words in Ecocorp does not really help learners acquire new vocabulary as most of these words are in the General Service List and are thus commonly used in other texts. There is probably little extra effect after a word has been repeated 300 or more times.

We can identify which corpus is better for both reading and vocabulary learning. The assumption for this is that reasonable coverage and reasonable repetitions are needed. Despite its smaller size, Ecocorp still has a wider range of vocabulary. The number of words not in the base lists occurring 5 times or more in Ecocorp is larger enough, 679 words and the number of words with frequencies of 1 – 4 is 3306 words. Acacorp has 1930 words occurring 5 times or more and 6454 words occurring 1 – 4 times. Compared to Acacorp, Ecocorp has much smaller number of low-frequency words of 1 – 4 occurrences. Based on these data Ecocorp is more favorable for reading and vocabulary learning in that it has a smaller number of low-frequency words outside the GSL and UWL and it has good repetitions of vocabulary.

* 1. How does Reading a Specialized Text Affect the Number of Technical Words that the Reader will Meet?

Identifying technical words in economics is rather difficult especially when identifying single words without looking at their contexts. Some of the very-high-frequency words which could be counted as technical words are also general English words in that they occur in the GSL. These words in fact have a special meaning in economics. The problem becomes more complicated when we see that many technical terms in economics are in the form of phrases.

Technical words in this context are those which are specially used in economics. There are several ways of identifying technical words, for example, by looking at the words which also occur in Parkin’s glossary or in a dictionary of economics, by looking at the comparative frequency of high-frequency words, by looking at frequent words not in the GSL or UWL, and by looking at words which occur only in Ecocorp.

The purpose of this section is to see if it is possible to isolate the technical words by using frequency and range. For example, are the technical words those that occur frequently outside the GSL and UWL? The success of the frequency and range approaches will be assessed by seeing if the words found occur in the dictionary of economics or Parkin’s glossary.

* + 1. The Most Frequent Words

One way of identifying technical words is to use comparative frequency. This includes the very-high-frequency words which have a much higher frequency and those which have a higher rank in Ecocorp than in Acacorp.

Being a specialized text, Ecocorp has more very-high-frequency words than Acacorp. The 82 words with frequencies higher than 300 in Ecocorp that are not in Acacorp with a frequency higher than 300 account for 56,215 occurrences. This is 19.04% of the running words in Ecocorp. 46.34% (38 words) of these words occur in Parkin’s glossary and 62.5% (50 words) in the dictionary of economics (Pearce, 1992). Typical words are *price*, *demand*, *produce*, *consume*, *capital*, *average*, etc., in the first 1,000 words of the GSL; *curve*, *firm*, *industry*, *govern*, *unit*, *slope*, *decrease*, *model*, etc., in the second 1,000. Another sub-group of words are those which also occur in the UWL including *margin*, *economy*, *income*, *labour*, *consume*, *vary*, *utility*, *factor*, *resource*, *maximum*, etc. These words have a much narrower meaning in economics than in general use.

The words such as *price*, *demand*, and *capital* are specialized words in the following phrases:

*price discrimination*, *price-earning ratio*, *price taker*, *price elasticity of demand*, *price effect*, *demand curve*, *demand schedule*, *derived demand*, *quantity of capital demanded*, *inputs of capital and land*, etc.

*Demand* in economics means the entire relationship between the quantity demanded of a good and its price (Parkin, 1990), but in general usage (West, 1953), it may mean *claim*, *commerce*, *needs* (nouns); and *claim*, *need*, *ask* (verbs). In economics *demand* is mostly used in reduced clauses as in *quantity demanded* which occur very frequently in the corpus. *Capital* has some common meanings in GSL. The highest semantic frequency is *town* or *city* as in *Paris is the capital of France*; the second is *money* and the third is *capital letter* (West, 1953). In economics, *capital* refers to the real assets—equipment, buildings, tools, and other manufactured goods used in production—owned by a household , firm, or government (Parkin, 1990).

The word list can also be seen in Table 5.3 which lists a number of the most frequent 100 content words which have a frequency seven times more than their frequency of occurrence in Acacorp. We can see that many technical words are found using this criterion. Thus, looking at the comparative frequency of words in the list is an effective way of identifying technical words. However, many technical words can be found in the high-frequency words not in the GSL or UWL and in the lower-frequency non-overlapping words as well. So, the relative frequency criterion is useful, but not inclusive enough.

* + 1. The Frequent Words not in the GSL or UWL

Another way of identifying technical words is to look at the words that are not in the GSL or UWL. Some of the very-high-frequency words in Ecocorp do not occur in the GSL and UWL. These words make up another group of what could be technical words in economics. The number of words in Ecocorp but not in the GSL and UWL is 3,224 word families or 59.29% of the total 5,438 word families. By identifying a representative 558-word sample of the words not in the GSL and UWL, it was found that 11.47% occur in the dictionary of economics (Pearce, 1992) and 3.76% in Parkin’s glossary. The most frequent words in Ecocorp and not in GSL and UWL are *output* (861), *revenue* (763), *goods* (705), *percent* (450), *monopoly* (454), *input* (366), *elasticity* (333), *competitive* (264), *long-run* (241), *competition* (207), *percentage* (211), *substitution* (180), *regulation* (176), and *budget* (171). Their frequency in the 295294-word corpus is given in brackets. All of these words occur in the dictionary of economics (Pearce, 1992); and four words—*output*, *input*, *percent*, and *percentage*—do not occur in Parkin’s glossary. In addition, in the 100 most frequent words in this list, 53 words occur in the dictionary of economics, and 44 words in Parkin’s glossary.

Using this criterion, about 50% of the frequent words not in the GSL and UWL were technical words in economics. It shows that looking at high-frequency words is still a good way of extracting specialized words. Although it by no means includes all the technical words in the text, when combined with the relative-frequency criterion, most useful of the technical words are isolated.

* + 1. Non-Overlapping Words

A third way to identify technical words is to include the group of words occurring in Ecocorp but not in Acacorp (Table 4.7). The number of words in Ecocorp but not in Acacorp is 2,124 word families (39.06% of the total word families in Ecocorp). 95.39% of these words (2,026 words) do not occur in either the GSL or UWL. When we compare a representative 369-word sample of these non-overlapping words with the dictionary of economics and Parkin’s glossary, we find that 5.4% (approximately 114 words out of 2,124 non-overlapping words) are in the dictionary and 2.7% (approximately 57 words out of 2,124 non-overlapping words) are in Parkin’s glossary. Some words occur in Parkin’s glossary but not in the dictionary, for example *decentralized*, *not-for-profit*, *self-sufficiency*, and *tit-for-tat*. Many technical words in this list are in the lower frequency levels, such as *nontariff*, *oligopolistic*, *profitably*, *regulatory*, etc. Some of them are hyphenated words, like *price-earning* as in *price-earning ratio*, *tit-for-tat* as in *tit-for-tat strategy*, *upward-sloping* as in *upward-sloping section*, *downward-sloping* as in *downward-sloping demand curve*, *profit-sharing* as in *profit-sharing arrangements*, etc.

Looking at the three criteria described above, this criterion is the least effective in isolating the technical words in the economics text. It is not too difficult to use frequency and range criteria to isolate high-frequency technical words. It seems impossible to use the same criteria to isolate the low-frequency technical words because every corpus will contain a large number of low-frequency non-technical words.

Ecocorp as a specialized text contains a large number of technical words that the reader will meet when reading it. Most of them are repeated quite frequently and that can decrease readers’ vocabulary load. These frequent technical words do not cause a great problem. The frequent repetitions of a word help learning and comprehension. When a new word is learnt from the text, in the next occurrences it would be at least partly as a familiar word. The problem is in dealing with low-frequency words with few or no repetitions. The learners would need to guess the meaning of the words from their contexts and make use of a dictionary.

* 1. Does General Academic English Prepare Learners for a Specialized Text?

It is useful to see if general academic English prepares learners for the specialized vocabulary of a subject such as economics. In order to see this it is necessary to see what words occur in Ecocorp and not in Acacorp and the frequency of these words.

It is obvious that the two texts are much different in size. Acacorp has a considerably large number of word-forms and word families compared with Ecocorp. The number of low-frequency words in Acacorp is also much bigger than in Ecocorp.

The next aspect to look at is the number of overlapping and non-overlapping words in both corpora. Tables 4.6 and 4.7 give this information. We find that 56% of the first 4,000 words in Ecocorp overlap with Acacorp; another 28.65% do not occur in Acacorp at all and 15.35% occur outside the first 4,000 words of Acacorp. Thus, there are 2,124 words in Ecocorp that do not occur at all in Acacorp. This represents almost 40% of the vocabulary of Ecocorp. It is estimated that only 5.4% of the 2,124 non-overlapping words in Ecocorp are technical words in economics. Here are some examples of the non-overlapping words: *athletes*, *biotechnology*, *barrel*, *bankrupt*, *black-market*, *Hong Kong*, *million*, *salesperson*, *swanky*, *switchgear*, etc. Studying general academic English would still leave a large proportion of unknown words that the learner needs to read a specialized text. These are several reasons for this. Firstly, some of the vocabulary occurring in Ecocorp are technical words, but the number of technical words in the non-overlapping words is very small, only 5.4%. Secondly, there are a large number of proper nouns and topic words found in the economics text. Finally, a large number of general words do not occur in Acacorp because the corpus of general academic English is only a 300,000-word corpus, which is small.

If we look closely at the overlapping words in each level, we find that most of the words are very common in that they occur in the GSL as well. It is clear that general academic English does not have enough coverage of the specialized vocabulary of economics that the learners need. It is estimated that the number of technical words in the economics text is 461 words. This research shows that if we teach general academic English vocabulary to economics students, then we do not get very good vocabulary coverage for economics (Sutarsyah. et al., 1994).

* 1. What is the Value of Corpus Studies for ESP Course Design?

Theoretical and empirical information is needed in ESP course design in order to produce a syllabus that contains useful materials for teaching. This study has focused on English for Specific Purposes and the results of this study provide a general idea of the value of corpus study for ESP course design. Many benefits can be identified. Firstly, by doing corpus research, we can more easily look at the many types of words occurring in the corpus and we can also compare them with those in another corpus to see the differences. We can find the number of the words in the text with their frequency to provide the view on the relative importance of the words. Corpus study can also give information about the behavior of lexical items in the text. The most frequent collocations and stylistic patterns can be identified by using concordances. In short, ‘the important thing computers can do for developing materials is to count things, to compare things, to sort things, and to find things’ (Carter, 1987: 181). The analysis based on frequency counts in this study has provided information on the most important economics words in the text. The importance of these high-frequency words is striking when their occurrence in specialized text is compared with their occurrence in general academic English. The results of this study can be of value in material design in ESP in that it helps provide teaching materials that will fit the specific subject area of particular learners.

* 1. Future Research

The scope of this study is limited and many aspects might be investigated further. It would be interesting to look more closely at the nature of technical vocabulary. The following questions may guide future research:

1. What are significant collocates of particular high-frequency technical words in economics?
2. What specialized words in economics might be ignored?
3. What strategies do learners use to deal with low-frequency technical words?
4. What are the learner’s problems when dealing with specialized vocabulary?

This study has focused on text. This could be looked at more closely and further study could look at the interaction between learners and text.

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Appendix 1

The list of the most frequent 1,000 words from the economics text and general academic texts.

| Rank | Ecocorp | | Acacorp | |
| --- | --- | --- | --- | --- |
| 1 | THE | 22905 | THE | 23890 |
| 2 | OF | 12710 | OF | 14591 |
| 3 | BE | 10686 | BE | 14021 |
| 4 | A | 9952 | AND | 8455 |
| 5 | AND | 8323 | IN | 8077 |
| 6 | IN | 7010 | TO | 7867 |
| 7 | TO | 6502 | A | 7857 |
| 8 | THAT | 4392 | THAT | 3400 |
| 9 | PRICE | 3080 | HAS | 3217 |
| 10 | FOR | 2912 | THIS | 3143 |
| 11 | IT | 2674 | IT | 3071 |
| 12 | WE | 2534 | FOR | 3060 |
| 13 | HAS | 2514 | AS | 2574 |
| 14 | COST | 2251 | BY | 2351 |
| 15 | BY | 2034 | WITH | 2110 |
| 16 | THIS | 2003 | THEY | 2056 |
| 17 | DEMAND | 1944 | ON | 1956 |
| 18 | ON | 1882 | WHICH | 1631 |
| 19 | AS | 1831 | HE | 1590 |
| 20 | THEY | 1820 | NOT | 1544 |
| 21 | CURVE | 1804 | OR | 1542 |
| 22 | AT | 1797 | AT | 1535 |
| 23 | FIRM | 1743 | FROM | 1518 |
| 24 | SUPPLY | 1590 | CAN | 1242 |
| 25 | QUANTITY | 1467 | WE | 1205 |
| 26 | CAN | 1442 | BUT | 1103 |
| 27 | MARGIN | 1427 | USE | 974 |
| 28 | WILL | 1378 | ONE | 922 |
| 29 | ECONOMY | 1353 | SOME | 894 |
| 30 | FROM | 1337 | THERE | 894 |
| 31 | PRODUCE | 1237 | DO | 793 |
| 32 | IF | 1202 | MORE | 744 |
| 33 | INCOME | 1183 | OTHER | 704 |
| 34 | DO | 1165 | ALL | 694 |
| 35 | WITH | 1135 | THAN | 666 |
| 36 | MARKET | 1101 | IF | 662 |
| 37 | BUT | 1090 | MAKE | 656 |
| 38 | OR | 1058 | MAY | 636 |
| 39 | EACH | 1038 | I | 615 |
| 40 | LABOUR | 1004 | ONLY | 608 |
| 41 | INCREASE | 1002 | NO | 595 |
| 42 | CONSUME | 995 | WHEN | 581 |
| 43 | THAN | 977 | YEAR | 577 |
| 44 | NOT | 974 | SO | 571 |
| 45 | MORE | 963 | SUCH | 558 |
| 46 | OTHER | 957 | WOULD | 556 |
| 47 | TOTAL | 946 | WHO | 550 |
| 48 | CHANGE | 927 | TWO | 546 |
| 49 | RATE | 915 | ALSO | 529 |
| 50 | WHEN | 910 | ANY | 528 |
| 51 | CAPITAL | 907 | GIVE | 525 |
| 52 | WORK | 906 | WILL | 523 |
| 53 | ONE | 904 | TIME | 514 |
| 54 | MAKE | 893 | BETWEEN | 500 |
| 55 | WHICH | 886 | DIFFERENCE | 496 |
| 56 | WHAT | 870 | FORM | 491 |
| 57 | YOU | 866 | MOST | 485 |
| 58 | OUTPUT | 861 | WORK | 480 |
| 59 | USE | 829 | ABOUT | 478 |
| 60 | THERE | 823 | SHOW | 455 |
| 61 | AVERAGE | 777 | OUT | 442 |
| 62 | INDUSTRY | 777 | CASE | 435 |
| 63 | PRODUCTION | 772 | FIRST | 419 |
| 64 | TWO | 770 | FIND | 415 |
| 65 | REVENUE | 763 | HIGH | 408 |
| 66 | PRODUCT | 749 | SCHOOL | 402 |
| 67 | PROFIT | 733 | WHERE | 399 |
| 68 | SOME | 731 | NUMBER | 385 |
| 69 | HIGH | 715 | EACH | 382 |
| 70 | HOW | 710 | WHAT | 380 |
| 71 | ALL | 707 | VALUE | 376 |
| 72 | GOODS | 705 | INTO | 373 |
| 73 | POINT | 702 | TAKE | 373 |
| 74 | YEAR | 700 | PART | 372 |
| 75 | BETWEEN | 694 | CHILD | 368 |
| 76 | SHOW | 677 | NEWZEALAND | 367 |
| 77 | PART | 667 | THEN | 367 |
| 78 | GOOD | 659 | RESULT | 364 |
| 79 | EQUAL | 628 | SEE | 360 |
| 80 | TRADE | 621 | CONSIDER | 343 |
| 81 | PAY | 618 | HOWEVER | 343 |
| 82 | EXAMPLE | 599 | SHE | 343 |
| 83 | SHE | 598 | PROBLEM | 341 |
| 84 | DIFFERENCE | 562 | OVER | 340 |
| 85 | SEE | 559 | GROUP | 339 |
| 86 | PEOPLE | 555 | LARGE | 336 |
| 87 | WAGE | 552 | MANY | 335 |
| 88 | SUCH | 538 | SHOULD | 328 |
| 89 | RISE | 534 | VERY | 326 |
| 90 | BUY | 521 | BEING | 324 |
| 91 | ALSO | 519 | NEW | 323 |
| 92 | NO | 503 | CHANGE | 316 |
| 93 | LOW | 497 | MEAN | 315 |
| 94 | FALL | 492 | SAME | 314 |
| 95 | SO | 492 | GENERAL | 313 |
| 96 | GOVERN | 478 | POINT | 313 |
| 97 | PER | 470 | AREA | 309 |
| 98 | ONLY | 460 | TEST | 309 |
| 99 | FIGURE | 455 | MUST | 306 |
| 100 | MONOPOLY | 454 | MUCH | 299 |
| 101 | VARY | 454 | KNOW | 298 |
| 102 | PERCENT | 450 | PARTICULAR | 298 |
| 103 | HOUR | 445 | DEVELOP | 296 |
| 104 | MILLION | 445 | RATE | 293 |
| 105 | INTEREST | 444 | METHOD | 288 |
| 106 | MOVIE | 439 | BECAUSE | 285 |
| 107 | SELL | 439 | POSSIBLE | 284 |
| 108 | LINE | 437 | WELL | 284 |
| 109 | SAME | 428 | GREAT | 281 |
| 110 | TIME | 428 | UP | 280 |
| 111 | FIG | 421 | BOTH | 279 |
| 112 | VALUE | 417 | REQUIRE | 278 |
| 113 | TAX | 413 | INCREASE | 277 |
| 114 | UTILITY | 410 | SEEM | 273 |
| 115 | TABLE | 408 | SYSTEM | 273 |
| 116 | FACTOR | 406 | PRESENT | 265 |
| 117 | LARGE | 403 | STATE | 264 |
| 118 | GIVE | 398 | EXAMPLE | 263 |
| 119 | NEW | 398 | APPLY | 260 |
| 120 | POSSIBLE | 390 | LOW | 260 |
| 121 | RESOURCE | 387 | AFTER | 258 |
| 122 | HE | 385 | TERM | 257 |
| 123 | NUMBER | 385 | PROVIDE | 256 |
| 124 | DAY | 380 | THEORY | 256 |
| 125 | AMOUNT | 376 | THREE | 255 |
| 126 | SERVICE | 376 | SMALL | 254 |
| 127 | WOULD | 376 | ART | 252 |
| 128 | CAR | 374 | EFFECT | 250 |
| 129 | OUT | 371 | NOW | 249 |
| 130 | INPUT | 366 | FOLLOW | 248 |
| 131 | MAXIMUM | 361 | EVEN | 247 |
| 132 | HOUSEHOLD | 360 | LEVEL | 247 |
| 133 | RESULT | 357 | WAY | 245 |
| 134 | ABOUT | 355 | TABLE | 243 |
| 135 | WHO | 348 | SAY | 242 |
| 136 | UNIT | 345 | PEOPLE | 241 |
| 137 | ELAPSED | 342 | MEASURE | 240 |
| 138 | NOW | 342 | WORD | 239 |
| 139 | EFFECT | 341 | SINCE | 238 |
| 140 | CHOICE | 339 | OCCUR | 237 |
| 141 | INDIVIDUAL | 338 | STUDY | 237 |
| 142 | ELASTICITY | 333 | UNDER | 236 |
| 143 | WAY | 335 | VARY | 236 |
| 144 | LET | 332 | WHILE | 236 |
| 145 | EQUILIBRIUM | 328 | LESS | 234 |
| 146 | STOCK | 324 | LONG | 234 |
| 147 | CASE | 323 | CERTAIN | 233 |
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| 149 | THEORY | 312 | WOMAN | 228 |
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| 663 | INCUR | 52 | OFF | 66 |
| 664 | LEISURE | 52 | ANSWER | 65 |
| 665 | RECENT | 52 | AUTHORISE | 65 |
| 666 | SOCIALIST | 52 | COMMITTEE | 65 |
| 667 | USUAL | 52 | FACE | 65 |
| 668 | CAUSE | 51 | INSTANCE | 65 |
| 669 | DURING | 51 | LET | 65 |
| 670 | EXPERIENCE | 51 | PRESENCE | 65 |
| 671 | FAIR | 51 | REFERENCE | 65 |
| 672 | HISTORIC | 51 | SEEK | 65 |
| 673 | INTERVENE | 51 | STEM | 65 |
| 674 | PURCHASE | 51 | UPPER | 65 |
| 675 | QUICK | 51 | ACHIEVE | 64 |
| 676 | UPWARD | 51 | ACID | 64 |
| 677 | AIR | 51 | BELOW | 64 |
| 678 | LEAST-COST | 50 | FREQUENT | 64 |
| 679 | READ | 50 | HEAT | 64 |
| 680 | ROCKY | 50 | LACK | 64 |
| 681 | SCIENCE | 50 | MEET | 64 |
| 682 | SUBSIDIZE | 50 | ONCE | 64 |
| 683 | MAJOR | 50 | SURVEY | 64 |
| 684 | MONITOR | 49 | TEND | 64 |
| 685 | PRODUCTIVE | 49 | THIRD | 64 |
| 686 | RECORD | 49 | CHAPTER | 63 |
| 687 | UNTIL | 49 | HYPOTHESIS | 63 |
| 688 | WAR | 49 | RUN | 63 |
| 689 | ASPECT | 48 | START | 63 |
| 690 | DERIVE | 48 | ALONG | 62 |
| 691 | DIFFERENTIAL | 48 | ANIMAL | 62 |
| 692 | EXPENSIVE | 48 | CONVENE | 62 |
| 693 | ITEM | 48 | DEMONSTRATE | 62 |
| 694 | MAYOR | 48 | LOSS | 62 |
| 695 | PRACTICE | 48 | UNIVERSE | 62 |
| 696 | RIDE | 48 | WESTERN | 62 |
| 697 | STAND | 48 | AWAY | 61 |
| 698 | TRAIN | 48 | BOOK | 61 |
| 699 | ARRANGE | 47 | CHARACTERISTIC | 61 |
| 700 | DOMINATE | 47 | DIRECTION | 61 |
| 701 | DUOPOLY | 47 | ESSENTIAL | 61 |
| 702 | FISH | 47 | FLOW | 61 |
| 703 | INDIFFERENT | 47 | INTERPRET | 61 |
| 704 | MAN | 47 | NEXT | 61 |
| 705 | OFTEN | 47 | RESPECT | 61 |
| 706 | VOLUME | 47 | SODIUM | 61 |
| 707 | WOMAN | 47 | CORRECT | 60 |
| 708 | APPROACH | 46 | EXACT | 60 |
| 709 | EXCESS | 46 | FOOD | 60 |
| 710 | KIND | 46 | IMMEDIATE | 60 |
| 711 | LATE | 46 | PUT | 60 |
| 712 | LIE | 46 | SCIENCE | 60 |
| 713 | MEET | 46 | TREE | 60 |
| 714 | PLUS | 46 | ASPECT | 59 |
| 715 | STRAIGHT | 46 | CONTEXT | 59 |
| 716 | STRUCTURE | 46 | CRYSTAL | 59 |
| 717 | TEST | 46 | DISCUSSION | 59 |
| 718 | ADVANCE | 45 | FAIL | 59 |
| 719 | COLUMN | 45 | FREQUENCIES | 59 |
| 720 | CONSTRAINT | 45 | MOMENT | 59 |
| 721 | ESTABLISH | 45 | MONEY | 59 |
| 722 | INTERMEDIATE | 45 | NEVER | 59 |
| 723 | LOAN | 45 | OCCASION | 59 |
| 724 | PROGRAMME | 45 | PREPARE | 59 |
| 725 | TRICK | 45 | RESISTANCE | 59 |
| 726 | AGE | 44 | ADVANTAGE | 58 |
| 727 | FORMULA | 44 | DEPARTMENT | 58 |
| 728 | INSTEAD | 44 | ENSURE | 58 |
| 729 | ISSUE | 44 | MIND | 58 |
| 730 | PASS | 44 | OBJECTIVE | 58 |
| 731 | PERFORMANCE | 44 | ORGANIZE | 58 |
| 732 | AGRICULTURE | 43 | OXIDE | 58 |
| 733 | ANTITRUST | 43 | SERIOUS | 58 |
| 734 | DETAIL | 43 | WING | 58 |
| 735 | DOMESTIC | 43 | ATTENTION | 57 |
| 736 | EVENTUAL | 43 | BELIEVE | 57 |
| 737 | EXPENDITURE | 43 | BENEFIT | 57 |
| 738 | FEDERAL | 43 | CM | 57 |
| 739 | FOREIGN | 43 | DECISION | 57 |
| 740 | FUEL | 43 | ENOUGH | 57 |
| 741 | PATTERN | 43 | EXTENSIVE | 57 |
| 742 | SCORE | 43 | JUSTIFY | 57 |
| 743 | SHOULD | 43 | LATTER | 57 |
| 744 | THINK | 43 | MODERN | 57 |
| 745 | ACCORD | 42 | PAST | 57 |
| 746 | ATTEMPT | 42 | POTENT | 57 |
| 747 | BREAK | 42 | QUALITY | 57 |
| 748 | COMPLETE | 42 | SHIFT | 57 |
| 749 | LITTLE | 42 | TELL | 57 |
| 750 | WIN | 42 | ARRIVE | 56 |
| 751 | ALREADY | 41 | COMPONENT | 56 |
| 752 | APARTMENT | 41 | DOUBT | 56 |
| 753 | BOB | 41 | ELSE | 56 |
| 754 | DATA | 41 | EMPHASISE | 56 |
| 755 | DIRECTION | 41 | EXPRESSION | 56 |
| 756 | EXPRESS | 41 | MOTION | 56 |
| 757 | FACTORY | 41 | READY | 56 |
| 758 | GEAR | 41 | REST | 56 |
| 759 | HAND | 41 | RETURN | 56 |
| 760 | INSTITUTE | 41 | SEVEN | 56 |
| 761 | PICK | 41 | SORT | 56 |
| 762 | SERVE | 41 | STRENGTH | 56 |
| 763 | STEEL | 41 | SUIT | 56 |
| 764 | SUBSIDE | 41 | SUPPOSE | 56 |
| 765 | WITHIN | 41 | TEN | 56 |
| 766 | WRITE | 41 | TRANSFER | 56 |
| 767 | CONCERN | 40 | ARISE | 55 |
| 768 | COURSE | 40 | DECIDE | 55 |
| 769 | EVENT | 40 | DISCOVER | 55 |
| 770 | EXHAUST | 40 | EXCEPT | 55 |
| 771 | EXIT | 40 | FOOT | 55 |
| 772 | FOOD | 40 | POSITIVE | 55 |
| 773 | IMPLICATION | 40 | REJECT | 55 |
| 774 | MAP | 40 | SHAPE | 55 |
| 775 | MINUS | 40 | SHARE | 55 |
| 776 | ORANGE | 40 | THICK | 55 |
| 777 | PREVIOUS | 40 | VALE | 55 |
| 778 | WALKMAN | 40 | ZERO | 55 |
| 779 | APPLE | 39 | ADULT | 54 |
| 780 | AROUND | 39 | CITY | 54 |
| 781 | ATTENTION | 39 | COMMISSION | 54 |
| 782 | DEBT | 39 | DEBATE | 54 |
| 783 | DESIGN | 39 | EVIL | 54 |
| 784 | DRAMA | 39 | FORMAL | 54 |
| 785 | DRINK | 39 | HEALTH | 54 |
| 786 | FAILURE | 39 | JOHN | 54 |
| 787 | FAVOUR | 39 | MATRIX | 54 |
| 788 | INTERACT | 39 | PERFORM | 54 |
| 789 | LASER | 39 | PHILOSOPHY | 54 |
| 790 | PERHAPS | 39 | RELEVANCE | 54 |
| 791 | PROPORTION | 39 | SETTLE | 54 |
| 792 | SALESPERSON | 39 | DATE | 54 |
| 793 | STAY | 39 | DISEASE | 53 |
| 794 | SUPPORT | 39 | DISTINCT | 53 |
| 795 | WORD | 39 | DIVIDE | 53 |
| 796 | BAD | 38 | EMERGE | 53 |
| 797 | COMMAND | 38 | ENGINEER | 53 |
| 798 | DISTANCE | 38 | FINANCE | 53 |
| 799 | FAR | 38 | FIT | 53 |
| 800 | HEIGHT | 38 | GERMAN | 53 |
| 801 | IMPROVE | 38 | JOB | 53 |
| 802 | LUCK | 38 | MUSIC | 53 |
| 803 | MISTER | 38 | NOTED | 53 |
| 804 | MOMENTARY | 38 | POET | 53 |
| 805 | SEVERAL | 38 | PRACTICAL | 53 |
| 806 | CARE | 37 | PRECISE | 53 |
| 807 | CONSIST | 37 | QUANTITY | 53 |
| 808 | COORDINATE | 37 | SIGN | 53 |
| 809 | CYCLE | 37 | VISIT | 53 |
| 810 | GRADUAL | 37 | CIRCUMSTANCE | 52 |
| 811 | PAST | 37 | COEFFICIENT | 52 |
| 812 | PROPRIETORSHIP | 37 | CONFER | 52 |
| 813 | RECALL | 37 | CORRELATE | 52 |
| 814 | RESEARCH | 37 | DEEP | 52 |
| 815 | SCHOOL | 37 | GARDEN | 52 |
| 816 | STEADY | 37 | INTERNATIONAL | 52 |
| 817 | TEAM | 37 | INTERVIEW | 52 |
| 818 | TV | 37 | MINIMUM | 52 |
| 819 | YOUNG | 37 | MINUTE | 52 |
| 820 | ACROSS | 36 | AROUND | 51 |
| 821 | ATC | 36 | AUCKLAND | 51 |
| 822 | AWAY | 36 | BEAR | 51 |
| 823 | COMMODITY | 36 | CHARACTER | 51 |
| 824 | CONSTRUCT | 36 | CONSCIOUS | 51 |
| 825 | CONTRIBUTE | 36 | CONSTITUTE | 51 |
| 826 | CORRESPOND | 36 | CONTENT | 51 |
| 827 | DILEMMA | 36 | CONTRAST | 51 |
| 828 | ENFORCE | 36 | CUT | 51 |
| 829 | INVOLVE | 36 | DISPUTE | 51 |
| 830 | LOT | 36 | DUTY | 51 |
| 831 | NEITHER | 36 | MASS | 51 |
| 832 | OBJECTIVE | 36 | MECHANIC | 51 |
| 833 | SINGLE-PRICE | 36 | PLAY | 51 |
| 834 | TASK | 36 | PREDICT | 51 |
| 835 | TEMPORARY | 36 | RAISE | 51 |
| 836 | WATCH | 36 | RECOVER | 51 |
| 837 | WHITE | 36 | SLAB | 51 |
| 838 | CAPTURE | 35 | THROUGHOUT | 51 |
| 839 | DEREGULATION | 35 | TRY | 51 |
| 840 | DIAGRAM | 35 | ADMINISTER | 50 |
| 841 | EQUITIES | 35 | BOUNDARY | 50 |
| 842 | GAS | 35 | CAPITAL | 50 |
| 843 | MILE | 35 | CHARGE | 50 |
| 844 | MINER | 35 | COMMENT | 50 |
| 845 | NECESSARY | 35 | CYCLE | 50 |
| 846 | ONCE | 35 | EFFORT | 50 |
| 847 | PERFORM | 35 | FAVOUR | 50 |
| 848 | POPCORN | 35 | GRID | 50 |
| 849 | SEARCH | 35 | INTRODUCTION | 50 |
| 850 | CHECK | 34 | ION | 50 |
| 851 | CONCLUDE | 34 | JUDGE | 50 |
| 852 | JUSTICE | 34 | OUTPUT | 50 |
| 853 | KENT | 34 | PROFESSION | 50 |
| 854 | MICROWAVE | 34 | ROLE | 50 |
| 855 | PHYSICAL | 34 | SPEND | 50 |
| 856 | SATISFY | 34 | STAND | 50 |
| 857 | SPECIFY | 34 | WEST | 50 |
| 858 | TRANSACT | 34 | WHY | 50 |
| 859 | WHOLE | 34 | ASSIGN | 49 |
| 860 | ANNUAL | 33 | CODE | 49 |
| 861 | COMPLY | 33 | ENCOURAGE | 49 |
| 862 | DISTINGUISH | 33 | FUTURE | 49 |
| 863 | HEALTH | 33 | INFORMANT | 49 |
| 864 | IMAGINE | 33 | INTERNAL | 49 |
| 865 | LEE | 33 | NEGATIVE | 49 |
| 866 | MARK | 33 | OFFENCE | 49 |
| 867 | OWNERSHIP | 33 | SLIGHT | 49 |
| 868 | RELATION | 33 | SLOW | 49 |
| 869 | SECTION | 33 | STEP | 49 |
| 870 | TELEPHONE | 33 | SUBSTANTIAL | 49 |
| 871 | TRILLION | 33 | UNIVERSITY | 49 |
| 872 | WHEAT | 33 | ACROSS | 48 |
| 873 | YET | 33 | ADOPT | 48 |
| 874 | CHARACTERISTIC | 32 | ANNUAL | 48 |
| 875 | CHEMICAL | 32 | ASSOCIATION | 48 |
| 876 | CONTAIN | 32 | BASIC | 48 |
| 877 | DEPARTMENT | 32 | DELETION | 48 |
| 878 | DIVIDEND | 32 | DENSE | 48 |
| 879 | ENSURE | 32 | DETECT | 48 |
| 880 | INDICATE | 32 | DOMINATE | 48 |
| 881 | INDUCE | 32 | ENGLAND | 48 |
| 882 | INFERIOR | 32 | LOGIC | 48 |
| 883 | INTENSE | 32 | POLICE | 48 |
| 884 | INTERPRET | 32 | REFLUX | 48 |
| 885 | NEPOOL | 32 | SEVERE | 48 |
| 886 | OPEN | 32 | STIFF | 48 |
| 887 | PETER | 32 | UNIFORM | 48 |
| 888 | SCARCE | 32 | ATTITUDE | 47 |
| 889 | SECURE | 32 | BANK | 47 |
| 890 | SHUT | 32 | BREAK | 47 |
| 891 | SPACE | 32 | CONTACT | 47 |
| 892 | WIDE | 32 | DISPLACE | 47 |
| 893 | ACCOUNTANT | 32 | MATHEMATICS | 47 |
| 894 | AFFORDABLE | 32 | NOTICE | 47 |
| 895 | COMMISSION | 32 | PICTURE | 47 |
| 896 | CONTRACT | 32 | REDUCTION | 47 |
| 897 | DROP | 32 | SAND | 47 |
| 898 | ELECT | 32 | AFFIX | 46 |
| 899 | ENCOURAGE | 31 | AWARE | 46 |
| 900 | FRACTION | 31 | BIND | 46 |
| 901 | GOAL | 31 | BLOCK | 46 |
| 902 | KNOWLEDGE | 31 | BRITAIN | 46 |
| 903 | LORENSTEVENS | 31 | EXHAUST | 46 |
| 904 | MAINTAIN | 31 | FRAME | 46 |
| 905 | MIDDLE | 31 | IMAGE | 46 |
| 906 | NEWYORK | 31 | ISOLATE | 46 |
| 907 | PROFESSOR | 31 | PRIMITIVE | 46 |
| 908 | PROTECT | 31 | PUPIL | 46 |
| 909 | STRONG | 31 | STYLE | 46 |
| 910 | TOWARD | 31 | SUM | 46 |
| 911 | WASTE | 31 | AIM | 45 |
| 912 | ACCEPT | 30 | ALONE | 45 |
| 913 | ASSOCIATE | 30 | AUTHOR | 45 |
| 914 | BELIEVE | 30 | DEATH | 45 |
| 915 | CINEMA | 30 | DIE | 45 |
| 916 | DOWNWARD | 30 | EXTREME | 45 |
| 917 | EUROPE | 30 | HOPE | 45 |
| 918 | FOCUS | 30 | INSTITUTE | 45 |
| 919 | HOME | 30 | ITEM | 45 |
| 920 | INTRODUCE | 30 | LEAVE | 45 |
| 921 | ISLAND | 30 | MACHINE | 45 |
| 922 | JENNY | 30 | NERVE | 45 |
| 923 | LIGHT | 30 | NOUN | 45 |
| 924 | LOWS | 30 | PHOTOGRAPH | 45 |
| 925 | NAME | 30 | REGULAR | 45 |
| 926 | NEVER | 30 | RELY | 45 |
| 927 | OBVIOUS | 30 | SCORE | 45 |
| 928 | POTENTIAL | 30 | STEAD | 45 |
| 929 | PURE | 30 | SUBSEQUENT | 45 |
| 930 | RAW | 30 | TREND | 45 |
| 931 | STOCKHOLDER | 30 | WHEREAS | 45 |
| 932 | TENDENCIES | 30 | ADVANCE | 44 |
| 933 | TRUE | 30 | ALUMINIUM | 44 |
| 934 | BEAR | 29 | APART | 44 |
| 935 | COMPONENT | 29 | ARM | 44 |
| 936 | DISTINCT | 29 | COMPOSITION | 44 |
| 937 | DIVERSE | 29 | COUNT | 44 |
| 938 | ESTIMATE | 29 | DANGER | 44 |
| 939 | IMPLY | 29 | ENVIRONMENT | 44 |
| 940 | LOCATE | 29 | EQUIVALENT | 44 |
| 941 | NONMARKET | 29 | EXPAND | 44 |
| 942 | NOR | 29 | FERRITE | 44 |
| 943 | PREVAIL | 29 | INCIDENT | 44 |
| 944 | PROFESSION | 29 | PARTICLE | 44 |
| 945 | REFLECT | 29 | PROVE | 44 |
| 946 | SEEM | 29 | RARE | 44 |
| 947 | SHAPE | 29 | REPEAT | 44 |
| 948 | SLIGHT | 29 | SAVE | 44 |
| 949 | UNEQUAL | 29 | TODAY | 44 |
| 950 | WELFARE | 29 | TYPICAL | 44 |
| 951 | CATEGORY | 28 | VERTICAL | 44 |
| 952 | COLLUSIVE | 28 | AVOID | 43 |
| 953 | CORRECT | 28 | BLACK | 43 |
| 954 | ELEMENT | 28 | CLASSIC | 43 |
| 955 | ENTERPRISE | 28 | DOCTOR | 43 |
| 956 | POSITION | 28 | ERR | 43 |
| 957 | PURSUE | 28 | EXCLUDE | 43 |
| 958 | REDUCTION | 28 | GAIN | 43 |
| 959 | RELEVANCE | 28 | HEAR | 43 |
| 960 | REVEAL | 28 | IGNITION | 43 |
| 961 | SCHEME | 28 | LINK | 43 |
| 962 | SENSE | 28 | NOR | 43 |
| 963 | SHIRK | 28 | PERMANENT | 43 |
| 964 | TRIANGLE | 28 | REVEAL | 43 |
| 965 | TRUCK | 28 | SPEED | 43 |
| 966 | ARROW | 27 | SUFFER | 43 |
| 967 | CENT | 27 | UNLESS | 43 |
| 968 | CONNECTION | 27 | VIRGIN | 43 |
| 969 | EARTHQUAKE | 27 | WAVE | 43 |
| 970 | EUROPEAN | 27 | CHEMICAL | 42 |
| 971 | FOOT | 27 | DEPENDENT | 42 |
| 972 | IMPORTANCE | 27 | DEVICE | 42 |
| 973 | INC | 27 | DISK | 42 |
| 974 | OLD | 27 | DIVISION | 42 |
| 975 | PARTNERSHIP | 27 | EXISTENCE | 42 |
| 976 | PIECE | 27 | FORMER | 42 |
| 977 | PRECISE | 27 | HAPPEN | 42 |
| 978 | RECTANGLE | 27 | HEAVY | 42 |
| 979 | REFER | 27 | INTRODUCE | 42 |
| 980 | RETAIL | 27 | LEGISLATE | 42 |
| 981 | RISK | 27 | MILLION | 42 |
| 982 | ROLE | 27 | NEVERTHELESS | 42 |
| 983 | SHOP | 27 | PARLIAMENT | 42 |
| 984 | SLOW | 27 | PRIOR | 42 |
| 985 | SMITH | 27 | PROGRESS | 42 |
| 986 | STAGE | 27 | PROTECTION | 42 |
| 987 | STEP | 27 | SERUM | 42 |
| 988 | SWITCHGEAR | 27 | YIELD | 42 |
| 989 | TAXI | 27 | BEHIND | 41 |
| 990 | TREND | 27 | EIGHT | 41 |
| 991 | CEILING | 26 | FIRM | 41 |
| 992 | CONTRAST | 26 | GENERATE | 41 |
| 993 | DEFICIT | 26 | GLASS | 41 |
| 994 | DELIVER | 26 | HOUSEHOLD | 41 |
| 995 | DIFFICULT | 26 | LOSE | 41 |
| 996 | EMPHASIZE | 26 | MAP | 41 |
| 997 | GREEN | 26 | PERCENT | 41 |
| 998 | INSURANCE | 26 | PERMIT | 41 |
| 999 | LEND | 26 | REFORM | 41 |
| 1000 | MAJORITY | 26 | SURE | 41 |

Appendix 3

The rank-order list of the most frequent 500 content words from economics text compared with the most frequent 1,000 of general academic text (\* not in the first 1,000 words of Acacorp; - not in Acacorp at all).

| No. | Word | Frequency | | Rank Order | |
| --- | --- | --- | --- | --- | --- |
| Ecocorp | Acacorp | Ecocorp | Acacorp |
| 1 | PRICE | 3080 | 90 | 9 | 479 |
| 2 | COST | 2251 | 91 | 14 | 471 |
| 3 | DEMAND | 1944 | 102 | 17 | 411 |
| 4 | CURVE | 1804 | 83 | 21 | 525 |
| 5 | FIRM | 1743 | 41 | 23 | 991 |
| 6 | SUPPLY | 1590 | 86 | 24 | 509 |
| 7 | QUANTITY | 1467 | 53 | 25 | 807 |
| 8 | MARGIN | 1427 | 24 | 27 | \* |
| 9 | ECONOMY | 1353 | 172 | 29 | 224 |
| 10 | PRODUCE | 1237 | 167 | 31 | 234 |
| 11 | INCOME | 1183 | 96 | 33 | 442 |
| 12 | MARKET | 1104 | 110 | 36 | 372 |
| 13 | LABOUR | 1004 | 131 | 40 | 313 |
| 14 | INCREASE | 1002 | 277 | 41 | 113 |
| 15 | CONSUME | 995 | 70 | 42 | 623 |
| 16 | TOTAL | 946 | 114 | 47 | 362 |
| 17 | CHANGE | 927 | 316 | 48 | 92 |
| 18 | RATE | 915 | 293 | 49 | 104 |
| 19 | CAPITAL | 907 | 50 | 51 | 842 |
| 20 | WORK | 906 | 480 | 52 | 58 |
| 21 | MAKE | 893 | 656 | 54 | 37 |
| 22 | OUTPUT | 861 | 50 | 58 | 852 |
| 23 | USE | 829 | 974 | 59 | 27 |
| 24 | THERE | 823 | 894 | 60 | 30 |
| 25 | AVERAGE | 777 | 90 | 61 | 475 |
| 26 | INDUSTRY | 777 | 186 | 61 | 191 |
| 27 | PRODUCTION | 772 | 84 | 63 | 552 |
| 28 | REVENUE | 763 | 10 | 65 | \* |
| 29 | PRODUCT | 749 | 106 | 66 | 390 |
| 30 | PROFIT | 733 | 27 | 67 | \* |
| 31 | SOME | 731 | 894 | 68 | 29 |
| 32 | HIGH | 715 | 408 | 69 | 65 |
| 33 | GOODS | 705 | 21 | 72 | \* |
| 34 | POINT | 702 | 313 | 73 | 96 |
| 35 | YEAR | 700 | 577 | 74 | 43 |
| 36 | SHOW | 677 | 455 | 76 | 60 |
| 37 | PART | 667 | 372 | 77 | 74 |
| 38 | GOOD | 659 | 102 | 78 | 414 |
| 39 | EQUAL | 628 | 109 | 79 | 376 |
| 40 | TRADE | 621 | 85 | 80 | 518 |
| 41 | PAY | 618 | 130 | 81 | 320 |
| 42 | EXAMPLE | 599 | 263 | 82 | 118 |
| 43 | DIFFERENCE | 562 | 496 | 84 | 55 |
| 44 | SEE | 559 | 360 | 85 | 79 |
| 45 | PEOPLE | 555 | 241 | 86 | 136 |
| 46 | WAGE | 552 | 75 | 87 | 589 |
| 47 | SUCH | 538 | 558 | 88 | 45 |
| 48 | RISE | 534 | 87 | 89 | 500 |
| 49 | BUY | 521 | 35 | 90 | \* |
| 50 | ALSO | 519 | 529 | 91 | 49 |
| 51 | NO | 503 | 595 | 92 | 41 |
| 52 | LOW | 497 | 260 | 93 | 120 |
| 53 | FALL | 492 | 109 | 94 | 377 |
| 54 | GOVERN | 478 | 166 | 96 | 236 |
| 55 | PER | 470 | 214 | 97 | 158 |
| 56 | ONLY | 460 | 608 | 98 | 40 |
| 57 | FIGURE | 455 | 148 | 99 | 268 |
| 58 | MONOPOLY | 454 | 13 | 100 | 8 |
| 59 | VARY | 454 | 236 | 101 | 143 |
| 60 | PERCENT | 450 | 41 | 102 | 997 |
| 61 | HOUR | 445 | 77 | 103 | 569 |
| 62 | MILLION | 445 | 42 | 104 | 981 |
| 63 | INTEREST | 444 | 213 | 105 | 160 |
| 64 | MOVIE | 439 | 2 | 106 | \* |
| 65 | SELL | 439 | 32 | 107 | \* |
| 66 | LINE | 437 | 157 | 108 | 251 |
| 67 | SAME | 428 | 314 | 109 | 94 |
| 68 | TIME | 428 | 514 | 110 | 53 |
| 69 | FIG | 421 | 174 | 111 | 216 |
| 70 | VALUE | 417 | 376 | 112 | 71 |
| 71 | TAX | 413 | 112 | 113 | 367 |
| 72 | UTILITY | 410 | - | 114 | - |
| 73 | TABLE | 408 | 243 | 115 | 134 |
| 74 | FACTOR | 406 | 143 | 116 | 284 |
| 75 | LARGE | 403 | 336 | 117 | 86 |
| 76 | GIVE | 398 | 525 | 118 | 51 |
| 77 | NEW | 398 | 323 | 119 | 91 |
| 78 | POSSIBLE | 390 | 284 | 120 | 107 |
| 79 | RESOURCE | 387 | 31 | 121 | \* |
| 80 | NUMBER | 385 | 385 | 123 | 68 |
| 81 | DAY | 380 | 177 | 124 | 204 |
| 82 | AMOUNT | 376 | 106 | 125 | 387 |
| 83 | SERVICE | 376 | 122 | 126 | 342 |
| 84 | CAR | 374 | 10 | 128 | \* |
| 85 | INPUT | 366 | 34 | 129 | \* |
| 86 | MAXIMUM | 361 | 79 | 130 | 560 |
| 87 | HOUSEHOLD | 360 | 41 | 131 | 994 |
| 88 | RESULT | 357 | 364 | 132 | 78 |
| 89 | UNIT | 345 | 135 | 136 | 307 |
| 90 | ELAPSED | 342 | 7 | 137 | \* |
| 91 | NOW | 342 | 249 | 138 | 129 |
| 92 | EFFECT | 341 | 250 | 139 | 128 |
| 93 | CHOICE | 339 | 39 | 140 | \* |
| 94 | INDIVIDUAL | 338 | 208 | 141 | 166 |
| 95 | WAY | 335 | 245 | 142 | 133 |
| 96 | LET | 332 | 65 | 143 | 669 |
| 97 | EQUILIBRIUM | 328 | 21 | 144 | \* |
| 98 | STOCK | 324 | 72 | 145 | 609 |
| 99 | CASE | 323 | 435 | 146 | 62 |
| 100 | TAKE | 319 | 373 | 147 | 73 |
| 101 | THEORY | 312 | 256 | 148 | 124 |
| 102 | STUDY | 311 | 237 | 149 | 141 |
| 103 | SLOPE | 309 | 19 | 150 | \* |
| 104 | LESS | 308 | 234 | 151 | 145 |
| 105 | BENEFIT | 306 | 57 | 153 | 737 |
| 106 | OWN | 302 | 175 | 155 | 213 |
| 107 | TAPE | 298 | 6 | 156 | \* |
| 108 | FIRST | 295 | 419 | 157 | 63 |
| 109 | WEALTH | 295 | 12 | 158 | \* |
| 110 | DECREASE | 289 | 18 | 160 | \* |
| 111 | DETERMINE | 285 | 173 | 161 | 219 |
| 112 | SWEATER | 285 | - | 162 | - |
| 113 | CHAPTER | 282 | 63 | 163 | 686 |
| 114 | SCALE | 280 | 108 | 164 | 380 |
| 115 | MODEL | 279 | 180 | 165 | 197 |
| 116 | OPPORTUNITY | 278 | 31 | 166 | \* |
| 117 | SODA | 278 | 1 | 167 | \* |
| 118 | EXPECT | 275 | 142 | 168 | 287 |
| 119 | SPEND | 275 | 50 | 169 | 855 |
| 120 | COUNTRY | 271 | 193 | 171 | 183 |
| 121 | GO | 271 | 159 | 172 | 244 |
| 122 | BECAUSE | 270 | 285 | 174 | 106 |
| 123 | MEASURE | 269 | 240 | 175 | 137 |
| 124 | CALCULATE | 266 | 82 | 177 | 534 |
| 125 | LEVEL | 266 | 247 | 178 | 132 |
| 126 | TECHNOLOGY | 266 | 93 | 179 | 463 |
| 127 | COMPETITIVE | 264 | 14 | 180 | \* |
| 128 | EMPLOY | 261 | 138 | 181 | 300 |
| 129 | MOST | 261 | 485 | 182 | 57 |
| 130 | DISTRIBUTE | 259 | 127 | 183 | 327 |
| 131 | PERFECT | 258 | 21 | 184 | \* |
| 132 | PLANT | 254 | 83 | 185 | 530 |
| 133 | JUST | 253 | 114 | 186 | 358 |
| 134 | LOSS | 253 | 62 | 187 | 694 |
| 135 | GET | 249 | 131 | 188 | 312 |
| 136 | BOTH | 245 | 279 | 190 | 111 |
| 137 | CORN | 242 | 2 | 191 | \* |
| 138 | LONG-RUN | 241 | 1 | 192 | \* |
| 139 | LOOK | 240 | 76 | 194 | 578 |
| 140 | PERSON | 237 | 171 | 195 | 225 |
| 141 | CALL | 236 | 98 | 196 | 433 |
| 142 | SMALL | 236 | 254 | 197 | 126 |
| 143 | GRAPH | 235 | 6 | 198 | \* |
| 144 | THEN | 233 | 367 | 199 | 77 |
| 145 | VOTE | 233 | 28 | 200 | \* |
| 146 | PLAN | 228 | 33 | 201 | \* |
| 147 | RENT | 227 | 38 | 202 | \* |
| 148 | SITUATION | 225 | 75 | 203 | 588 |
| 149 | SHORT-RUN | 224 | - | 204 | - |
| 150 | NATURE | 222 | 227 | 205 | 150 |
| 151 | DOLLAR | 220 | 14 | 206 | \* |
| 152 | RELATIONSHIP | 219 | 86 | 207 | 506 |
| 153 | FIX | 214 | 39 | 209 | \* |
| 154 | EVERY | 213 | 111 | 210 | 368 |
| 155 | MINIMUM | 213 | 52 | 211 | 818 |
| 156 | PERCENTAGE | 211 | 32 | 212 | \* |
| 157 | FUTURE | 209 | 49 | 213 | 862 |
| 158 | COMPETITION | 207 | 21 | 215 | \* |
| 159 | EVEN | 206 | 247 | 216 | 131 |
| 160 | REGULATION | 206 | 16 | 217 | \* |
| 161 | SUPPOSE | 206 | 56 | 218 | 764 |
| 162 | WEEK | 205 | 68 | 219 | 648 |
| 163 | GROW | 204 | 174 | 220 | 217 |
| 164 | SHIFT | 203 | 57 | 221 | 748 |
| 165 | GREAT | 202 | 281 | 222 | 109 |
| 166 | ILLUSTRATE | 202 | 71 | 223 | 617 |
| 167 | ASSET | 201 | 7 | 224 | \* |
| 168 | STATE | 201 | 264 | 225 | 117 |
| 169 | THING | 201 | 102 | 226 | 420 |
| 170 | AGENT | 200 | 30 | 227 | \* |
| 171 | OCCUR | 198 | 237 | 228 | 140 |
| 172 | CONSTANT | 197 | 77 | 229 | 567 |
| 173 | IMPORT | 196 | 25 | 230 | \* |
| 174 | WORLD | 195 | 145 | 231 | 280 |
| 175 | AVAILABLE | 193 | 145 | 232 | 275 |
| 176 | THUS | 193 | 174 | 233 | 218 |
| 177 | DEPEND | 192 | 93 | 234 | 458 |
| 178 | RUN | 191 | 63 | 236 | 688 |
| 179 | ACTIVE | 190 | 146 | 237 | 270 |
| 180 | GROUP | 188 | 339 | 238 | 85 |
| 181 | SWANK | 188 | - | 239 | - |
| 182 | QUESTION | 187 | 147 | 240 | 269 |
| 183 | PROBLEM | 186 | 341 | 241 | 83 |
| 184 | RULE | 186 | 175 | 242 | 214 |
| 185 | ACHIEVE | 185 | 64 | 243 | 675 |
| 186 | LIKE | 185 | 173 | 244 | 220 |
| 187 | PUBLIC | 185 | 159 | 245 | 246 |
| 188 | IMPORTANT | 184 | 199 | 246 | 172 |
| 189 | PRESENT | 184 | 265 | 247 | 116 |
| 190 | REAL | 183 | 177 | 249 | 206 |
| 191 | CLOTH | 181 | 7 | 250 | \* |
| 192 | PLAY | 181 | 51 | 251 | 833 |
| 193 | RIGHT | 181 | 93 | 252 | 462 |
| 194 | SUBSTITUTION | 180 | 12 | 253 | \* |
| 195 | SET | 178 | 197 | 254 | 176 |
| 196 | BUDGET | 177 | 8 | 255 | \* |
| 197 | EARN | 177 | 26 | 256 | \* |
| 198 | TYPE | 177 | 180 | 257 | 198 |
| 199 | POLITICAL | 175 | 103 | 258 | 406 |
| 200 | SYSTEM | 174 | 273 | 259 | 115 |
| 201 | BEST | 173 | 66 | 260 | 657 |
| 202 | WANT | 173 | 87 | 261 | 502 |
| 203 | INTERNATIONAL | 172 | 52 | 262 | 816 |
| 204 | ENTER | 170 | 87 | 263 | 497 |
| 205 | SURPLUS | 170 | 4 | 264 | \* |
| 206 | MACHINE | 169 | 45 | 265 | 921 |
| 207 | RETURN | 168 | 56 | 266 | 759 |
| 208 | SINCE | 167 | 238 | 267 | 139 |
| 209 | SHARE | 166 | 55 | 268 | 775 |
| 210 | UNION | 166 | 72 | 269 | 612 |
| 211 | DESCRIBE | 165 | 144 | 270 | 282 |
| 212 | MONTH | 165 | 75 | 271 | 584 |
| 213 | ZERO | 164 | 55 | 272 | 778 |
| 214 | BUSHEL | 162 | - | 273 | - |
| 215 | INFLUENCE | 162 | 140 | 274 | 293 |
| 216 | UNITEDSTATES | 162 | - | 276 | - |
| 217 | VEST | 161 | 85 | 277 | 515 |
| 218 | MOVE | 160 | 212 | 278 | 161 |
| 219 | RECEIVE | 160 | 69 | 279 | 634 |
| 220 | COMPENSATE | 158 | 17 | 280 | \* |
| 221 | FAMILY | 158 | 105 | 281 | 398 |
| 222 | PROVIDE | 157 | 256 | 282 | 123 |
| 223 | DIVIDE | 156 | 53 | 283 | 795 |
| 224 | EXPORT | 154 | 33 | 284 | \* |
| 225 | FOLLOW | 154 | 248 | 285 | 130 |
| 226 | ABLE | 153 | 184 | 286 | 193 |
| 227 | ACTION | 152 | 92 | 287 | 466 |
| 228 | GAIN | 152 | 43 | 288 | 958 |
| 229 | RESTRICT | 152 | 75 | 289 | 587 |
| 230 | SECOND | 152 | 192 | 290 | 184 |
| 231 | SIMILAR | 152 | 194 | 291 | 181 |
| 232 | AGREE | 151 | 109 | 293 | 375 |
| 233 | COMPUTE | 151 | 93 | 294 | 456 |
| 234 | LAW | 150 | 103 | 295 | 405 |
| 235 | LONG | 150 | 234 | 296 | 146 |
| 236 | FINANCE | 149 | 53 | 297 | 798 |
| 237 | PREDICT | 149 | 51 | 298 | 834 |
| 238 | BECOME | 148 | 213 | 299 | 159 |
| 239 | GAME | 148 | 11 | 301 | \* |
| 240 | BILLION | 147 | 11 | 302 | \* |
| 241 | ELASTIC | 146 | 34 | 304 | \* |
| 242 | NEXT | 146 | 61 | 306 | 704 |
| 243 | ORIGIN | 146 | 86 | 307 | 505 |
| 244 | BEGIN | 145 | 146 | 308 | 271 |
| 245 | METHOD | 145 | 288 | 309 | 105 |
| 246 | SKILL | 145 | 39 | 310 | \* |
| 247 | ANSWER | 143 | 65 | 312 | 664 |
| 248 | CHOOSE | 143 | 82 | 313 | 535 |
| 249 | PARTY | 143 | 109 | 314 | 379 |
| 250 | INDIFFERENCE | 141 | - | 315 | - |
| 251 | REMAIN | 141 | 159 | 316 | 247 |
| 252 | LAND | 139 | 96 | 317 | 443 |
| 253 | OPERATE | 139 | 107 | 318 | 384 |
| 254 | DECISION | 138 | 57 | 319 | 739 |
| 255 | FORM | 138 | 491 | 320 | 56 |
| 256 | ORGANIZE | 138 | 58 | 321 | 731 |
| 257 | PLACE | 138 | 211 | 322 | 163 |
| 258 | SUBSTITUTE | 138 | 12 | 323 | \* |
| 259 | COMPARE | 137 | 120 | 324 | 344 |
| 260 | COMPANY | 136 | 31 | 325 | \* |
| 261 | EFFICIENT | 136 | 21 | 326 | \* |
| 262 | SPECIAL | 136 | 127 | 327 | 329 |
| 263 | BALANCE | 135 | 32 | 328 | \* |
| 264 | CONSIDER | 135 | 343 | 329 | 80 |
| 265 | FACT | 134 | 194 | 330 | 180 |
| 266 | BIG | 133 | 27 | 331 | \* |
| 267 | HAIRCUT | 133 | - | 332 | - |
| 268 | MEAN | 133 | 315 | 333 | 93 |
| 269 | SAVE | 133 | 44 | 334 | 948 |
| 270 | EXCEED | 132 | 32 | 335 | \* |
| 271 | HAPPEN | 132 | 42 | 336 | 977 |
| 272 | MONEY | 132 | 59 | 337 | 721 |
| 273 | NET | 132 | 26 | 338 | \* |
| 274 | FRONTIER | 131 | 13 | 339 | \* |
| 275 | HIRE | 131 | 1 | 340 | \* |
| 276 | ARISE | 130 | 55 | 341 | 767 |
| 277 | EFFICIENCY | 130 | 24 | 342 | \* |
| 278 | EXCHANGE | 130 | 72 | 343 | 607 |
| 279 | PROCESS | 130 | 158 | 344 | 250 |
| 280 | EXPLAIN | 129 | 125 | 345 | 335 |
| 281 | FARM | 129 | 38 | 346 | \* |
| 282 | FLUCTUATE | 129 | 20 | 347 | 8 |
| 283 | HOLD | 129 | 116 | 348 | 354 |
| 284 | RAISE | 129 | 51 | 349 | 835 |
| 285 | HOUSE | 128 | 159 | 351 | 245 |
| 286 | OIL | 128 | 27 | 352 | \* |
| 287 | SAY | 128 | 242 | 353 | 135 |
| 288 | WHETHER | 128 | 118 | 354 | 351 |
| 289 | WILLING | 128 | 8 | 355 | \* |
| 290 | LEAD | 127 | 197 | 356 | 175 |
| 291 | PRIVATE | 127 | 81 | 357 | 547 |
| 292 | ACTUAL | 126 | 100 | 358 | 423 |
| 293 | EQUIPMENT | 126 | 35 | 359 | \* |
| 294 | KNOW | 126 | 298 | 360 | 101 |
| 295 | NEED | 125 | 203 | 361 | 170 |
| 296 | BASE | 124 | 172 | 362 | 222 |
| 297 | EXTERNAL | 124 | 30 | 363 | \* |
| 298 | GRAIN | 124 | 12 | 364 | \* |
| 299 | ALLOCATE | 123 | 18 | 365 | \* |
| 300 | BUSINESS | 123 | 27 | 366 | \* |
| 301 | TECHNIQUE | 122 | 111 | 368 | 370 |
| 302 | POWER | 121 | 161 | 370 | 240 |
| 303 | INVENTORIES | 120 | 8 | 371 | \* |
| 304 | POSITIVE | 120 | 55 | 372 | 772 |
| 305 | CHEAT | 119 | 4 | 373 | \* |
| 306 | CONDITION | 119 | 203 | 374 | 169 |
| 307 | DEVELOP | 119 | 296 | 375 | 103 |
| 308 | RELATIVE | 119 | 178 | 376 | 203 |
| 309 | TODAY | 119 | 44 | 377 | 949 |
| 310 | UNDERSTAND | 119 | 106 | 378 | 394 |
| 311 | BEHAVIOR | 117 | 129 | 379 | 321 |
| 312 | BETTER | 115 | 80 | 380 | 552 |
| 313 | JOB | 115 | 53 | 381 | 801 |
| 314 | FACE | 114 | 65 | 382 | 667 |
| 315 | GENERATE | 114 | 41 | 383 | 992 |
| 316 | ISOQUANT | 114 | - | 384 | - |
| 317 | PARTICULAR | 114 | 298 | 385 | 102 |
| 318 | SINGLE | 114 | 82 | 386 | 540 |
| 319 | CLOSE | 113 | 146 | 387 | 272 |
| 320 | BUILD | 112 | 138 | 388 | 299 |
| 321 | CURRENT | 111 | 86 | 390 | 503 |
| 322 | REPRESENT | 111 | 86 | 391 | 507 |
| 323 | DOWN | 110 | 83 | 392 | 528 |
| 324 | ALTERNATIVE | 109 | 66 | 393 | 656 |
| 325 | ANALYSE | 109 | 232 | 394 | 148 |
| 326 | COMBINE | 109 | 82 | 395 | 536 |
| 327 | BOND | 108 | 5 | 396 | \* |
| 328 | FIND | 108 | 415 | 397 | 64 |
| 329 | PERIOD | 108 | 179 | 398 | 200 |
| 330 | SHORT | 108 | 102 | 399 | 419 |
| 331 | ADDITION | 107 | 106 | 400 | 386 |
| 332 | CUT | 107 | 51 | 401 | 828 |
| 333 | GENERAL | 107 | 313 | 402 | 95 |
| 334 | OUTCOME | 107 | 14 | 403 | \* |
| 335 | REVIEW | 107 | 37 | 404 | \* |
| 336 | SOVIET | 107 | 9 | 405 | \* |
| 337 | TARIFF | 107 | 3 | 406 | \* |
| 338 | CONTROL | 106 | 196 | 407 | 177 |
| 339 | ISOCOST | 106 | 3 | 408 | \* |
| 340 | EFFORT | 105 | 50 | 409 | 846 |
| 341 | TURN | 105 | 69 | 410 | 637 |
| 342 | EXACT | 104 | 60 | 411 | 708 |
| 343 | LAST | 104 | 121 | 412 | 343 |
| 344 | STUDENT | 104 | 69 | 413 | 636 |
| 345 | ACCOUNT | 103 | 98 | 414 | 432 |
| 346 | LIMIT | 103 | 151 | 415 | 262 |
| 347 | NATION | 103 | 106 | 416 | 389 |
| 348 | HUMAN | 102 | 79 | 417 | 558 |
| 349 | PREFERENCE | 102 | 25 | 418 | \* |
| 350 | WELL | 102 | 284 | 419 | 108 |
| 351 | IMPOSE | 101 | 37 | 420 | \* |
| 352 | ADVANTAGE | 100 | 58 | 421 | 726 |
| 353 | ALMOST | 100 | 113 | 422 | 363 |
| 354 | EXAMINATION | 100 | 1 | 424 | \* |
| 355 | INFORM | 100 | 216 | 425 | 156 |
| 356 | SIX-PACK | 100 | - | 426 | - |
| 357 | AREA | 99 | 309 | 427 | 97 |
| 358 | CORPORATE | 99 | 2 | 428 | \* |
| 359 | TELL | 99 | 57 | 429 | 749 |
| 360 | AMONG | 98 | 88 | 430 | 487 |
| 361 | CHARGE | 98 | 50 | 431 | 843 |
| 362 | DISCOVER | 97 | 55 | 432 | 769 |
| 363 | FEW | 97 | 158 | 433 | 249 |
| 364 | VERY | 96 | 326 | 435 | 89 |
| 365 | BACK | 95 | 97 | 436 | 436 |
| 366 | EMPIRE | 95 | 4 | 437 | \* |
| 367 | MAGIC | 95 | 5 | 438 | \* |
| 368 | PIONEERLAND | 95 | - | 439 | - |
| 369 | OBSERVE | 94 | 145 | 440 | 277 |
| 370 | SIZE | 94 | 108 | 441 | 381 |
| 371 | MAIN | 93 | 149 | 442 | 265 |
| 372 | UNEMPLOYMENT | 93 | 27 | 443 | \* |
| 373 | ENTIRE | 92 | 36 | 444 | \* |
| 374 | NEGATIVE | 92 | 49 | 446 | 865 |
| 375 | ALLOCATIVE | 91 | 1 | 447 | \* |
| 376 | ASSUME | 91 | 160 | 448 | 241 |
| 377 | RATIO | 91 | 103 | 450 | 409 |
| 378 | RESPOND | 91 | 155 | 451 | 255 |
| 379 | TERM | 91 | 257 | 452 | 122 |
| 380 | THEREFORE | 91 | 154 | 453 | 257 |
| 381 | AGAIN | 90 | 83 | 454 | 524 |
| 382 | DISCRIMINATION | 90 | 15 | 455 | \* |
| 383 | INCLUDE | 90 | 210 | 456 | 165 |
| 384 | SALE | 89 | 32 | 457 | \* |
| 385 | BANK | 88 | 47 | 458 | 889 |
| 386 | FEATURE | 88 | 73 | 459 | 597 |
| 387 | RANGE | 88 | 168 | 460 | 232 |
| 388 | AFFECT | 87 | 87 | 461 | 495 |
| 389 | FORCE | 87 | 170 | 462 | 226 |
| 390 | BRING | 86 | 87 | 463 | 496 |
| 391 | COMMON | 86 | 143 | 464 | 283 |
| 392 | KNIT | 86 | - | 465 | - |
| 393 | POOR | 86 | 36 | 466 | \* |
| 394 | RICH | 86 | 19 | 467 | \* |
| 395 | FREE | 86 | 120 | 468 | 345 |
| 396 | LEFT | 85 | 87 | 469 | 499 |
| 397 | MANAGE | 85 | 31 | 470 | \* |
| 398 | REASON | 85 | 206 | 471 | 168 |
| 399 | SCHEDULE | 85 | 28 | 472 | \* |
| 400 | DEGREE | 84 | 112 | 473 | 365 |
| 401 | FORECAST | 84 | 73 | 474 | 598 |
| 402 | HARD | 83 | 72 | 476 | 608 |
| 403 | SOCIAL | 83 | 152 | 477 | 261 |
| 404 | SUM | 83 | 46 | 478 | 910 |
| 405 | THIRD | 83 | 64 | 479 | 685 |
| 406 | VERTICAL | 83 | 44 | 480 | 951 |
| 407 | POUND | 82 | 33 | 482 | \* |
| 408 | REQUIRE | 82 | 278 | 483 | 112 |
| 409 | ROW | 81 | 11 | 484 | \* |
| 410 | STRATEGY | 81 | 15 | 485 | \* |
| 411 | AXIS | 80 | 22 | 486 | \* |
| 412 | EAGER | 80 | 8 | 487 | \* |
| 413 | ELECTRIC | 80 | 68 | 488 | 641 |
| 414 | LIFE | 80 | 102 | 489 | 416 |
| 415 | SEEK | 80 | 65 | 490 | 672 |
| 416 | ALONG | 79 | 62 | 491 | 690 |
| 417 | ALWAYS | 79 | 97 | 492 | 435 |
| 418 | DECIDE | 79 | 55 | 493 | 768 |
| 419 | ORDER | 79 | 160 | 494 | 243 |
| 420 | POLITICIAN | 79 | 14 | 495 | \* |
| 421 | QUOTA | 79 | 2 | 496 | \* |
| 422 | APPEAR | 78 | 178 | 498 | 201 |
| 423 | COMPETE | 78 | 13 | 499 | \* |
| 424 | EXIST | 78 | 92 | 500 | 467 |
| 425 | GALLON | 78 | - | 501 | - |
| 426 | HOWEVER | 78 | 343 | 502 | 81 |
| 427 | RATIONAL | 78 | 14 | 503 | 8 |
| 428 | TRY | 78 | 51 | 504 | 839 |
| 429 | INELASTIC | 77 | 3 | 507 | \* |
| 430 | CREATE | 76 | 90 | 508 | 476 |
| 431 | EQUATION | 76 | 153 | 509 | 259 |
| 432 | FINAL | 76 | 102 | 510 | 413 |
| 433 | FLOW | 76 | 61 | 511 | 702 |
| 434 | LOSE | 76 | 41 | 512 | 995 |
| 435 | MATTER | 76 | 93 | 513 | 460 |
| 436 | START | 76 | 63 | 514 | 689 |
| 437 | OFFER | 75 | 84 | 515 | 521 |
| 438 | REDUCE | 75 | 142 | 516 | 288 |
| 439 | APPLY | 74 | 260 | 517 | 119 |
| 440 | DEAL | 74 | 89 | 518 | 484 |
| 441 | ENOUGH | 74 | 57 | 519 | 740 |
| 442 | GASOLINE | 74 | - | 520 | - |
| 443 | HALF | 74 | 71 | 521 | 614 |
| 444 | INITIAL | 74 | 73 | 522 | 601 |
| 445 | KEEP | 74 | 79 | 523 | 559 |
| 446 | BUREAUCRACY | 73 | 1 | 525 | \* |
| 447 | COME | 73 | 193 | 526 | 182 |
| 448 | EARLY | 73 | 211 | 527 | 162 |
| 449 | REGULATE | 73 | 11 | 528 | \* |
| 450 | ADJUST | 72 | 24 | 529 | \* |
| 451 | PRINCIPAL | 72 | 30 | 530 | \* |
| 452 | PROFIT-MAXIMIZING | 72 | - | 531 | - |
| 453 | PROPERTY | 72 | 103 | 532 | 408 |
| 454 | REDISTRIBUTION | 72 | 1 | 533 | \* |
| 455 | DEFINE | 71 | 180 | 534 | 196 |
| 456 | DRAW | 71 | 75 | 535 | 585 |
| 457 | ELSE | 71 | 56 | 536 | 753 |
| 458 | OLIGOPOLY | 71 | - | 537 | - |
| 459 | PROVISION | 71 | 32 | 538 | \* |
| 460 | WORTH | 71 | 32 | 539 | \* |
| 461 | YARD | 71 | 9 | 540 | \* |
| 462 | BLUE | 70 | 9 | 541 | \* |
| 463 | HORIZONTAL | 70 | 23 | 542 | \* |
| 464 | SIMPLE | 70 | 156 | 543 | 252 |
| 465 | CONTINUE | 69 | 130 | 544 | 316 |
| 466 | DIMINISH | 69 | 6 | 545 | \* |
| 467 | EASY | 69 | 88 | 546 | 489 |
| 468 | FUNCTION | 69 | 201 | 547 | 171 |
| 469 | LEGAL | 69 | 37 | 548 | \* |
| 470 | PUT | 69 | 60 | 549 | 711 |
| 471 | UNSKILLED | 69 | 9 | 550 | \* |
| 472 | ENABLE | 68 | 33 | 551 | \* |
| 473 | YIELD | 68 | 42 | 552 | 988 |
| 474 | DEADWEIGHT | 67 | - | 553 | - |
| 475 | KEY | 67 | 17 | 554 | \* |
| 476 | PROPOSE | 67 | 74 | 555 | 592 |
| 477 | VIEW | 67 | 167 | 556 | 235 |
| 478 | CALCULATION | 66 | 28 | 557 | \* |
| 479 | CONFESS | 66 | 3 | 558 | \* |
| 480 | DECLINE | 66 | 38 | 559 | \* |
| 481 | END | 66 | 174 | 560 | 215 |
| 482 | EXPAND | 66 | 44 | 561 | 941 |
| 483 | STILL | 66 | 189 | 562 | 187 |
| 484 | ACT | 65 | 188 | 563 | 188 |
| 485 | ATTAIN | 65 | 29 | 564 | \* |
| 486 | COOPERATE | 65 | 2 | 565 | \* |
| 487 | DIRECT | 65 | 132 | 566 | 310 |
| 488 | IDENTICAL | 65 | 18 | 567 | \* |
| 489 | SOURCE | 65 | 106 | 568 | 393 |
| 490 | TRANSPORT | 65 | 35 | 569 | \* |
| 491 | ADD | 64 | 77 | 570 | 566 |
| 492 | ENORMOUS | 64 | 12 | 571 | \* |
| 493 | POPULATION | 64 | 110 | 572 | 373 |
| 494 | REGARD | 64 | 127 | 573 | 328 |
| 495 | SHOE | 64 | 1 | 574 | \* |
| 496 | SIDE | 64 | 118 | 575 | 350 |
| 497 | ACQUIRE | 63 | 39 | 576 | \* |
| 498 | BARREL | 63 | - | 577 | - |
| 499 | COMPARATIVE | 63 | 18 | 578 | \* |
| 500 | INTERSECT | 63 | 2 | 579 | \* |