Towards a 'social' history of terms in computing and economics for translation-oriented terminography

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1.Introduction

Terms live multiple lives. They may originate in general language or in another domain and may migrate back enriched by new meanings. In this process, they inhabit texts/documents at different levels of specialisation and popularization; they are found in dictionaries, glossaries and termbanks meant for different readerships, they undergo changes travelling in space and time from general to special languages and back, and from one special language to another. In order to be fully understood, terms cannot be detached from their contexts. And yet they are all the time, so they embark on new adventures in unexplored territories. It is their variation and variability across fields, domains and times that poses challenges to understanding – especially for translators engaged in processing texts at the leading edge of science and technology.

According to general terminology theory(Cabré1999: 35) terms are not excessively difficult to identify if we consider them from a formal or semantic point of view. If we consider them as pragmatic and/or communicative units, however, more problems arise because they "also beg certain questions, including the issues of domain delimitation and of communicative purpose or level of the text" (Ahmad *et al.* 1994: 269). The idea that the meaning of a term

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is diluted when it is used in a text addressing lay audiences has long been abandoned. Terms are not regarded as context-independent but as context-dependent, since they partake in text-making processes where text recipients or end-users are the focus of attention (cf. Temmerman 2000).

In this paper we propose a 'social' history of terms in two fields, computing and economics and finance, and in two languages, English and Italian. We consider terms – especially new ones – and how they are accounted for as texts unfold. Finally, we outline what happens when changes in reality, research and/or technologies alter their original context of use.

2. Theoretical premise and methodology

A social history of terms in fields such as computing and economics, where the interest of and interaction with the lay public is considerable, cannot overlook the social, communicative, cognitive and discursive dimensions of terminology. In other words, terms may not be fully understood if they are detached from the social and historical background where they originated, and term boundaries are not always clear-cut as a discipline evolves.

In terminology variation has been investigated within different usage contexts to highlight the genesis of a term, its reception and the reasons behind their success or failure. There are many possible ways of accessing, analysing and understanding terminological units (Cabré 2003). From a sociocognitive perspective, they are units of understanding (UoU) with a prototypical structure whereby one term may be 'more central' than another, especially in its historical or diachronic dimension (Temmerman 2000, Temmerman and Kerremans 2003). Groups or clusters of terminological variants are studied here with reference to the features they highlight synchronically and/or diachronically and their cognitive distance from the intended audience (Fernández-Silva and Kerremans (2011).In a more strictly cognitive framework, we combine a bottom up approach extracting information from different sources – whether online or in

the form of corpora – with a top-down approach drawing on expert knowledge and reference material (Faber 2012).

Within a diachronic framework meant to account for term consolidation and term change, we study the main types of term formation: coinage of new terms or primary term formation, borrowing from other languages, resource combination – typically compounding and derivation –, shortening (clippings, abbreviations or acronyms), and blending or conflating of two words (Humbley 2009, Resche 2013: 86-92). Borrowing, combination, shortening and blending are all types of secondary term formation. As such they are examples of greater or lesser terminological dependency (Humbley and García Palacios 2012). We also investigate new terms – whether metaphorical or not – as "motors and mirrors of change" (Resche 2013: 176) and interface terminology, both in its standard meaning of user- or consumer-friendly terminology in computing and in its more general acceptation of interdisciplinary or sub-technical terms in a range of fields including economics and finance (Resche 2013: 244).

3. The terminology of computing and information technology

The terminology of computing and information technology is extremely varied, constantly growing and changing, with no clear line separating specialized and low-end software. It includes not only designations specific to computer science, information science and new technologies, but also terms from different domains with different degrees of specialization, as well as the distinctive lexical items that define user interfaces and online presence, particularly social media (Corbolante and Musacchio 2012). Unlike other terminologies that have observable features and rules, such as medical, chemical and biological nomenclatures (cf. Sager 1990), IT terminology is not always well-motivated and rarely occurs in a systematic or controlled way.

Choice of designations can be influenced by non-linguistic factors, such as the demographics of the developers, including social niche, age and gender (cf. Chatfield 2013), but above all it is affected by lack of terminology awareness,

with no attention given to language variation, connotations and usage. Such issues are further amplified if those involved in the naming process are nonnative English speakers or seek to emphasize creative aspects of product development by inventing terms that are inconsistent with already existing designations (Warburton 2001: 678).

Innovation, rapid developments and the continuous emergence of new users' needs give rise to a fast evolution of concepts, accompanied by an equally fast naming process and an extremely rapid worldwide adoption, but also a significant obsolescence rate.

3.1. Primary term formation

The distinct language ecosystems contributing to IT and computing terminology are mirrored by the co-existence of heterogeneous trends and methods of primary term formation. This process is almost exclusively restricted to English as a source language and rarely occurs in a systematic or controlled way.

Lack of standardization across the industry means that several alternative or competing terms might exist for the same concept, or that the same term might designate different concepts (cf. Lombard 2006). The # symbol, for example, is variously known as *hash (sign), pound sign, number sign, octothorpe (octothorp, octathorp, octothorn, octatherp), crosshatch symbol, square, gate, double cross symbol, tick-tack-toe sign,* or *crunch* (Chatfield 2013: 11-12)*.* Nevertheless, Twitter chose to call it by yet another name, *hashtag*, and to describe any keyword marked with the # symbol as *hashtagged word* (cf. The Twitter Glossary). Most users, however, identify # as *number sign* and the combination #*word* as *hashtag*, and are confused by the information provided by Twitter (Corbolante 2013).

New forms are obtained by modification of existing resources andinclude affixation (*i, smart, cyber, un,* etc.), noun, phrase and eponymic compounding (*data validation task*, *plug&play*, *To-do list*, *Pin it button, Gantt chart*),

abbreviations (*app, blog*), acronyms (*URL, MP3)* and blends (*webinar, widget, netbook*), as well as deviant spelling (*phishing, phreakin, doxxing*).

Existing forms are given new meanings via grammatical transfer (*metrics, mashup)*, transdisciplinary borrowings (*virus, hibernate*), terminologization and metaphors (*tweet, cloud, spam, pinch*, *Over the Shoulder, elevation* etc.). The resulting semantic neologisms are usually easy to understand, transparent and linguistically economical (Schmitz 2007), yet they can also lead to ambiguities and indeterminacy, and result in imperfect analogies which are magnified when transferred into another language. Chou (2010) provides some insight into the indeterminacy of the term *cloud* that partly explains why it remains a vague concept for a majority of users in different cultures:

> [it] comes from the fact that many years ago those of us who built and sold client server applications, software and hardware used to draw a picture with the PC connected to a network and the network connected to a server. Since none of us actually understood how the network worked, we drew a cloud and labeled it 'network' and left it at that.

In this framework, awareness and understanding of the non-linguistic factors that can affect concept naming is extremely relevant also in secondary term formation.

3.2. Secondary term formation

The fundamental difference between primary and secondary term formation according to Sager (1990: 80) lies in the fact that in the former there is no linguistic precedent, whereas in the latter there is always the precedent of an existent term with its own motivation. Most mechanisms of primary term formation are also available to secondary term formation, with the addition of calques.

Factors that might influence the term formation process typically are: type of target audience, user experience (e.g. consumer or professional), product placement (e.g. influential market leader or newcomer, mainstream or niche),

market expectations and concept "point of entry"(how it enters the market, e.g. via early adopters and influencers, or popularised through mainstream channels), as well as costs in terms of time, money and resources (Corbolante and Musacchio 2012). Diachronic variation and the "social history" of terminology in individual cultures might also affect secondary term formation choices and will be now described.

3.3. Diachronic variation

Concepts and terminology evolve over time, and quite rapidly in the IT field. The evolution of alternative and competing terms should be monitored carefully, preferably by working with corpora, so as to identify variations in meaning and make the necessary adjustments to terminology records. Diachronic variation has different facets, each with different implications for terminology work.

- Consolidation is the process by which a number of originally co-existing and competing terms are gradually abandoned. For example, in 2008, a personal list of the designations for 'small data storage device with a USB interface', included *chiave USB*, *chiavetta*[*USB*], *chiavetta di memoria*, *pen drive*, *pendrive* (both genders), *penna USB*, *pennetta*, *unità flash USB*, *unità di memoria flash USB* for Italian. Six years later, most terms are still available but *unità flash USB* prevails in more technical contexts, and *chiavetta* [*USB*][*di memoria*] in informal ones; presumably, the competing terms will become obsolete over time. In Italian, consolidation might also apply to the gender of borrowings – unless a foreign noun is morphologically or phonetically similar to an existing Italian word, or easily comparable to a known concept, there is no clear-cut rule to determine whether it should be feminine or masculine, and in many cases both forms co-exist, e.g. *il/ la sandbox,il/ la cloud* (Corbolante 2011).*Font* is an interesting example: the masculine form, introduced by personal computing, is steadily replacing the predating feminine form now almost exclusively restricted to typographical contexts or highly specialized usage.
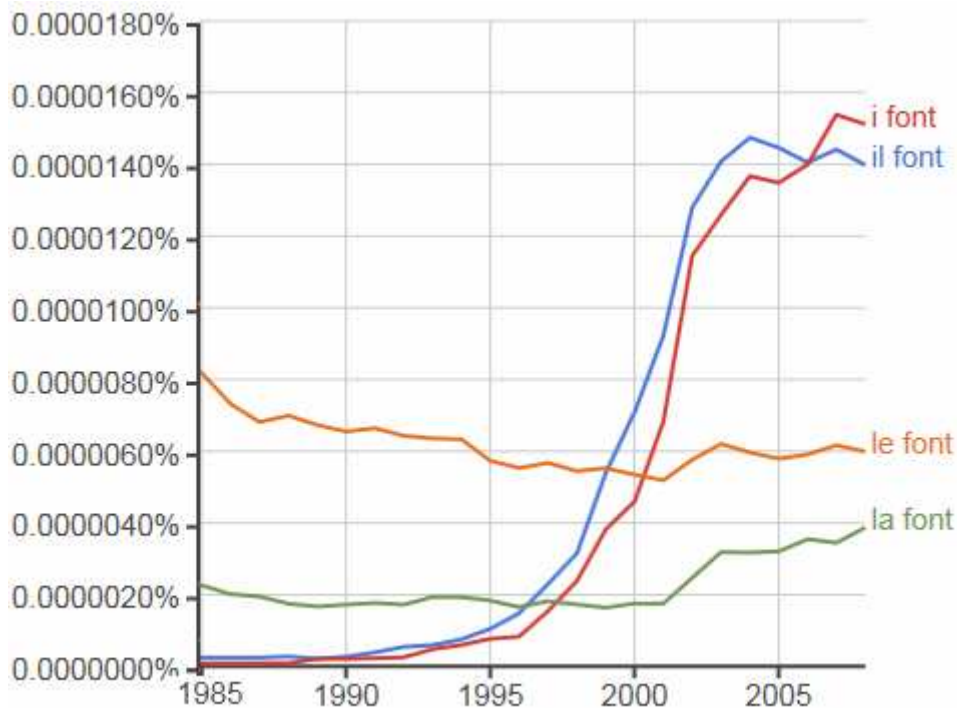
Fig. 3.1. Prevalence of *font* (M) over *font* (F) as shown in the corpus of Italian books of Google Ngram Viewer.

- Shifts and changes in meaning are relatively common but more difficult to account for because experts and advanced users adapt easily to new usages and might not be aware of any acquired arbitrariness, as shown by the term *drive*. Originally it designated the machinery that rotated ("drove") a computer disk, then it was used to describe the slot into which a disk was placed, as well as any storage medium attached to a computer, and more recently it has come to identify also a type of data storage device, *solid-state drive*, that has no moving mechanical components, therefore no "driving" takes place (Chatfield 2013: 282-284). Such changes are unlikely to affect English-speaking users, but there might be stronger implications in target languages, e.g. if different metaphors or term formation methods were originally used that make the shifts in meaning incompatible with existing designations (cf. Italian *disco rigido* vs *disco solido*).

- Retronyms are neologisms "created for an existing object or concept because the exact meaning of the original term used for it has become

ambiguous (usually as a result of a new development, technological advance, etc.)" (SOED). The most common type of retronym found in IT terminology consists of a noun with a modifier that specifies the original meaning of the noun, such as *static gif* [*image*]: originally, all *gifs* where static, and the term *animated gif* was coined to identify what, at the time, was an innovation. Over the years, the technology has evolved and nowadays *gif* is mainly understood as an animated image, which led to the creation of the retronym *static gif*. Retronyms are relevant in multilingual terminology work because they might require an update of existing terminology resources, but also because the same type of variation might not occur synchronically in all languages.

- Acceptability is the "adherence to the conventionalized norms for communication that apply in a particular social circumstance" (Shreve 2001: 775). Acceptability of terms can vary over time and can be affected by cultural and social factors and changed attitudes: some terms born out of metaphors, like master/slave, did not raise objections when they were used within a geeky environment, but were discarded as soon as they reached a wider audience. In Italian, personification and metaphors associated with living beings, their features or actions, such as *mouse, spider, worm, piggyback*, have been avoided for a long time in favor of borrowings. Presumably, they were perceived as low prestige and unacceptable in a context where computer applications used to enjoy a high status (Corbolante and Irmler 2001). The rejection established a trend that has persisted to this day, although there are signs that it is eventually reversing due to a shift in the demographics and preferences of digital natives (cf. *italiano dell'informatica*, still placed towards the more formal pole of the diaphasic axis in Berruto 2012: 191-193, but which appears to be moving closer to the more informal *italiano dei nuovi media*).

Acceptability can also be affected by trends in term formation, e.g. the *e-*prefix was extremely productive in the 1990s but is now out of fashion; similarly, the *i-* prefix might soon be outdated, with Apple dropping it from

its 2014 products. Phrasal compounds like *plug and play* or *drag and drop* are also gradually disappearing.

3.4. The evolution of Italian IT terminology

In the early years of localization, which extended into the early 1990s, Italian IT terminology was not dealt with systematically and was marked by inconsistencies, errors and false friends (*library – libreria, save – salvare,* and *string – stringa* are probably the best known examples). Adamo (1996) remarked that Italian lacked the pragmatic approach needed to define terminological work, its criteria and objectives, and reported a conflict between official terminology (as used in scientific publications, users' guides, and manuals), and the jargon used by software developers and in data centres. The growing relevance of consumer software added a third dimension, with its own terminology preferences. As a result, several alternative terms were often competing for the same concept, such as *scandire, scansire, scannerare, scannerizzare, scansionare*, *scannare* and *digitalizzare* to identify the action of converting a picture or document into digital form(*scan*), or *hard disk, disco fisso* and *disco rigido* for *hard disk*. Over the years, some consolidation occurred, but some of the more visible inconsistencies reported by Sosnowski (2000) and Roncaglia (2003) still persist. *Computer* is a typical example: in the 1980s it became the standard term in most contexts, but in academic settings and publications *calcolatore* and *elaboratore* are still the preferred options.
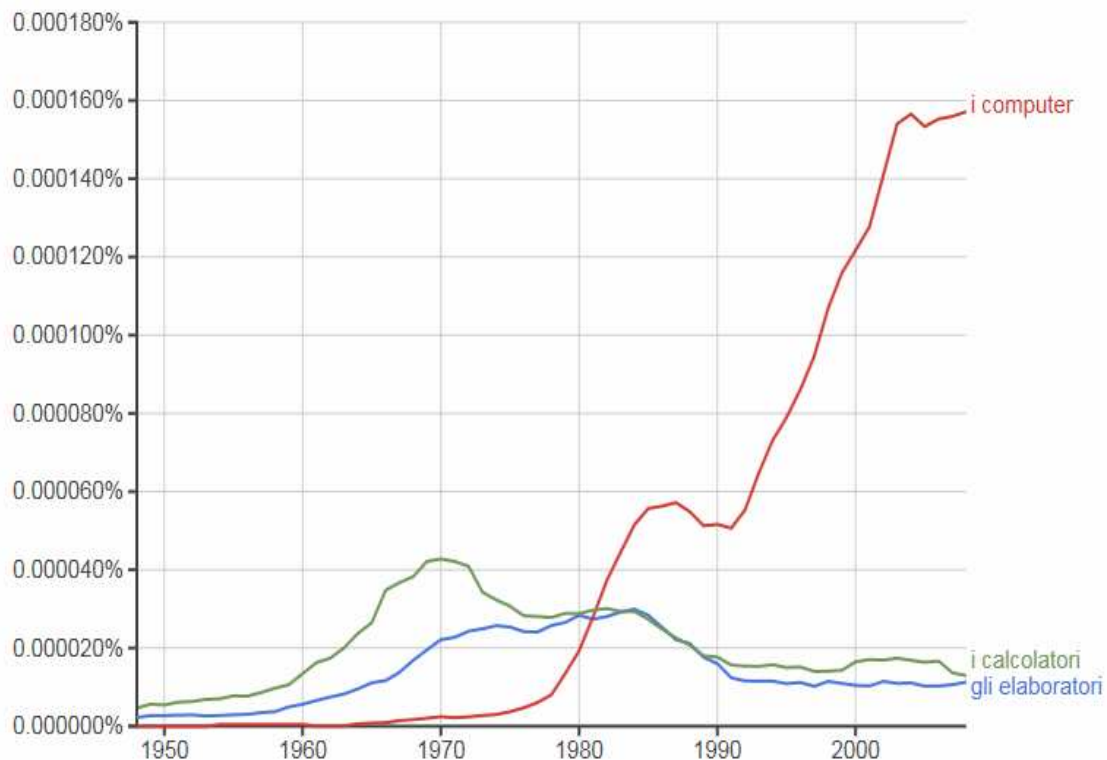
Fig. 3.2. Frequency of plural forms of *computer, calcolatore* and *elaboratore* in the corpus of Italian books of Google Ngram Viewer.

In the 1995-2005 period, the Italian horizontal market software was dominated by Microsoft and its terminology became the *de facto* standard for localized graphical user interfaces, productivity software and various consumer products. In personal communications, the main localization service providers consistently reported that competing software companies requested that Microsoft terminology should be used in the Italian versions of their products. This in turn led to increased terminology consistency for high visibility concepts, also in some cases where target term choices deviated considerably from the English source. Cases in point are the UI item *tab* in dialog boxes and browsers, named *scheda* in Italian products (an example of synecdoche – the term for the whole was chosen to refer to a part), and the *history* function in browsers, called *cronologia,* a semantic neologism unique to Italian – cf. French, Spanish and Portuguese calques *historique*, *historial* and *histórico*(Corbolante 2012)*.*

Describing Italian secondary term formation in IT at the end of the past century, Sosnowski (2000) observed two competing trends, "localization" by semantic neologisms and derivation, and "internationalization" by integral borrowings.

Personal experience in the field confirms that disagreement sometime arose between terminologists who wanted to explore all the options offered by Italian word-formation mechanisms, and marketing and software specialists who favoured borrowings and close adherence to English forms. This partly explains a number of Italian IT terms that are used consistently across the industry yet are not consistent with closely related terms, such as *download*, rendered in Italian as *scaricare*, verb, and *download*, noun (rather than *scaricamento*).

In the past decade, the Italian IT terminology scenario has once again changed. It has been impacted by various factors, including:

- the development of new technologies, with a shift towards mobile computing and apps (rather than applications);
- new media and social media;
- different demographics, with an ever expanding population of digital natives;
- the growing role of early adopters and influencers;
- the involvement of users through crowdsourcing initiatives;
- the emergence of new software players and the decline of Microsoft's prominence;
- different localization and terminology management models.

The result is new software ecosystems with a higher degree of fragmentation marked by stylistic and terminology inconsistencies. A comparison of the terminology used by Microsoft and Google to identify equivalent automatic filling features provides a typical example. The discrepancies are evident, not only in naming but also in spelling, and bound to increase if the terminology of other software producers were also included, or other autocorrect and automatic text replacement functions ('autocomplete') were added to the analysis.

Filling function	Microsoft	Google
fields in forms or web pages	*autocomplete* completamento automatico	*Autofill* compilazione automatica
Email addresses	*autocomplete* completamento automatico	*autocomplete* completamento automatico
formulas in spreadsheets	*AutoComplete* completamento automatico	*auto-complete* completamento automatico
cellranges in spreadsheets	*autofill / Auto fill* riempimento automatico	*Auto-fill* compilazione automatica

Table 3.1.Microsoft's and Google's designations for automatic data filling features.

Trends in global communication, the growing power of influencers, new forms of participation, and the generation of unregulated content in new media is now affecting terminology, particularly standardization. Terminologists working on secondary term formation need to verify if a concept has already entered the market before they attempt any standardization; if so, adoption of existing terminology, introduced by early adopters and influencers, might be the only available option. Choice might be restricted to a limited number of term candidates, which might not be particularly suitable or well-motivated, or not be consistent with already existing terminology, but it might be unadvisable to look into alternatives if such terms have already undergone a popularization process.

Lately, an even more marked preference for internationalisms has emerged. There is also higher acceptability for hybrids formed by an English root and an Italian derivational morpheme (Berruto 2012: 121), such as *debuggare, hackeraggio*, *linkare, pinnare*, which were once restricted to jargon. Gualdo (2009) attributes this shift to economic, political and social factors, to the lack of any standardization mechanism and hardly any control over the ever faster dissemination of concepts, as well as to the urge to conform to international models that are perceived as more prestigious (in comparison, other Romance

languages are more creative and still favour adaptations and new coinages over integral borrowings).

Inadequate English knowledge is possibly a further factor in the increase of borrowings, which are often arbitrarily attributed univocal and more specific meanings than they have in English. The recent announcement by the Italian government that *coding* would be introduced in Italian schools is a pertinent example: *coding* was preferred to the established Italian term *programmazione* by claiming it was more precise, yet in English it is a polysemic word with broad meanings. Italian usage of *coding* is not well motivated: its meaning is not transparent to non-English speakers, it is inconsistent with the name of the official site, *programmailfuturo.it*, and it does not allow any type of derivative – to describe any action related to it, speakers will have to resort to verb *programmare* and related words, such as *programma* and *linguaggio di programmazione* (Corbolante 2014).

Another recent change is observable for new concepts that are designated by an English word that shares the same root as a corresponding Italian word. Previously, semantic calques were the almost obligatory choice in Italian, e.g. *interactive, interface, processor* and *variable* became *interattivo, interfaccia, processore* and *variabile* (Sosnowski 2000). Nowadays, integral borrowings are not uncommon: rather than making semantic neologisms out of *comunità, sociale* and *sentimento* by means of terminologization*,* Italian chose to adopt the anglicisms *community, social* and *sentiment,* thus creating a new type of doublet.

Finally, as already remarked, the prevalence of digital natives and new technology ecosystems have prompted a rethinking of registers and style associated with IT terminology. A typical example is the syntagm *effettuare* + [borrowing], such as *effettuare il backup, effettuare il reengineering* etc., which was very productive in the previous decade. The verb is now being replaced by the less obtrusive *fare* also in more formal contexts.
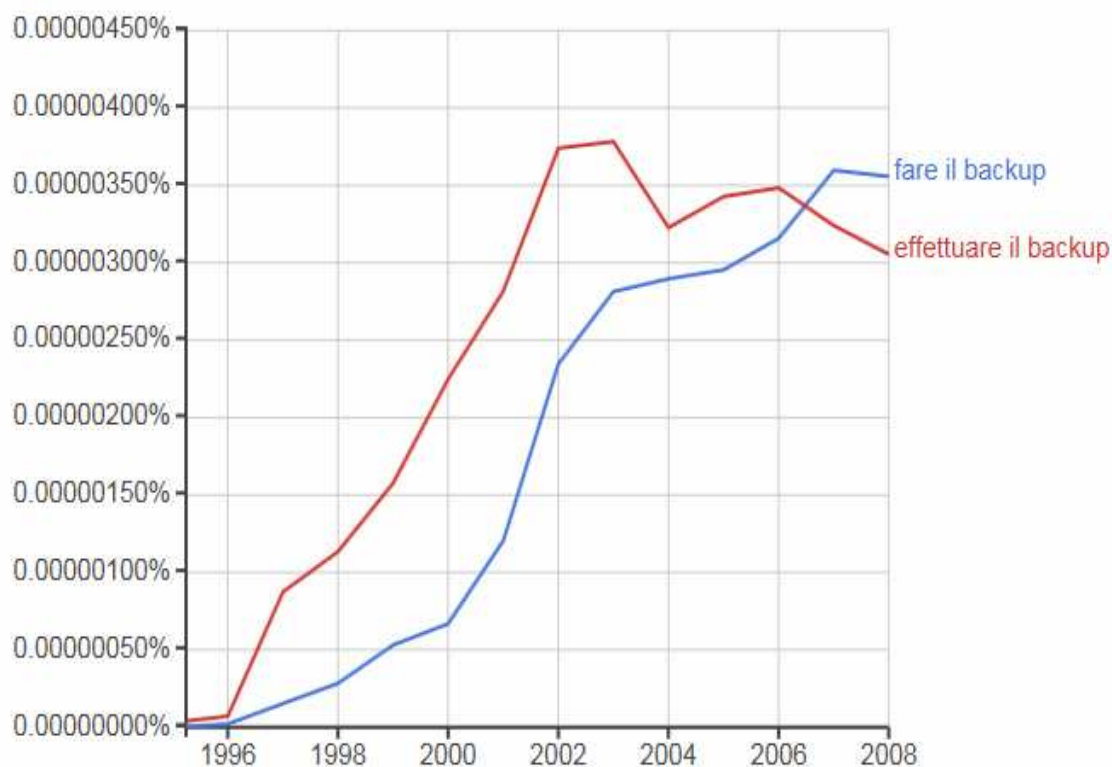
Fig. 3.3. Frequency of *effettuare il backup* vs *fare il backup* in the corpus of Italian books of Google Ngram Viewer.

3.5. Future trends

Information Technology and computing keep on evolving, at times unexpectedly. At the beginning of the century, the premises seemed to be in place for a higher degree of standardization of their Italian terminology, but it was not to be so. It is therefore impossible to make predictions, but it is safe to assume that IT terminology will continue to be characterised by considerable degrees of idiosyncrasy, indeterminacy and inconsistency. In this scenario, it is crucial to be aware of the history and development of terms, and the situational, cognitive and cultural factors that can affect their formation, so as to be better equipped when facing the challenges posed by effective terminology management.

4. The terminology of economics and finance

Economics and finance are part of our daily lives. From the coffee we buy in the morning to the performance of the stock exchanges we hear about in the evening news, much of our everyday experience is translated into economic and financial measures. Because we are constantly reminded of economic and financial matters in our daily lives, we think we are conversant in many topics in economics and finance. But is that really the case? Unlike physics, which uses old words to explain new phenomena, economics uses transparent words to account for "highly complicated, technical facts" (Beccaria 2001: 18). In other words, economics and finance – as soft science(s) largely relying on the methods of hard sciences and mathematical formulations – constantly contend with the multiple variables of (ir)rational human behaviour. Over time they have become more and more visible, as witnessed by daily news, but core concerns of economics, such as the allocation of limited resources and the distribution of wealth, are largely neglected in favour of more sensational stories (Gilibert 2001). Features of the deceptively familiar language of economics and finance include (Gualdo and Telve 2011: 371-374):

- peculiar term formation patterns such as antonymic pairs like *supply and demand*, *expansion and contraction*, *boom and bust*;
- use of clippings, abbreviations or acronyms such as *stagflation*, *CEO, ROI*;
- term formation through affixes which in Italian can also be used as standalone elements, such as *micro-* and *macro-* from *microeconomics* and *macroeconomics* in *analisi micro/analisi macro*;
- (metaphorical) terms taken from other sciences – chiefly physics, medicine and psychology – and used with different meanings such as *acceleration*, *speed*, *recovery* and *depression*;
- terms formed from general language words such as *growth* and *spread*;
- term variation as a function of the public: in Italian the *housing market* (*mercato immobiliare*) is often referred to as *casa* or *mattone* in newspapers and magazines addressing the lay public;
- frequency of eponyms, e.g. *Phillips curve*, *Pareto efficiency*;

- use of interface terms, such as *growth* as a synonym of *increase* and *fall/decline* for *decrease*.

Features of terminology have been studied here using a corpus of economic and financial reports and newspaper and magazine articles. For English, annual reports on the world economy, the IMF's *World Economic Outlook* and the *OECD Economic Outlook* together with annual reports of two central banks, the US Federal Reserve and the Bank of England, were chosen. English articles from the world press were collected using LexisNexis. For Italian, the annual reports of the Bank of Italy (BdI) and the National Institute of Statistics (ISTAT) were taken. Again, Italian articles were extracted using Lexis Nexis. The corpus is summarized in Table 4.1.below:

Text type	Source	Size (in tokens)	Authority	Language
Annual reports	IMF/OECD	2,461,978	Sources of economic information	English
Annual reports	Federal Reserve, Bank of England	1,333,547	Sources of economic information	English
Newspaper/magazine articles	LexisNexis	609,672	Influential newspapers/magazines	English
Newspaper/magazine articles	LexisNexis	1,306,223	Control corpus	English
Annual reports	Banca d'Italia	948,674	Sources of economic information	Italian
Annual reports	ISTAT	1,147,925	Sources of economic information	Italian
Newspaper/magazine articles	LexisNexis	152,425	Influential newspapers/magazines	Italian
Newspaper/magazine articles	LexisNexis	928,586	Control corpus	Italian

Table 4.1 Comparable corpora in English and Italian used to triangulate data on the terminology of the credit crisis.

4.1. Primary term formation

Primary term formation is mainly confined to English as a lingua franca. Besides terms formed as outlined above, some trends have become consolidated. This is the case with oxymorons like *flat curve* and *zero growth* that are easily recognisable models in terms relating to the recent crisis such as *toxic assets* or *troubled assets*, euphemisms such as *slowdown* for *downturn/recession*, clipped terms like *stagdeflation* from *stagnation* and *deflation*– on the model of *stagflation* from *stagnation* and *inflation*; abbreviations such as the *"D"word*, which can however stand both for *depression* and *deflation* or, indeed, any other economic or financial term with initial *D*. Other productive term formation patterns include metaphors such as *bailout* and *leverage*, and new coinages using affixes, as in *subprime mortgages* from *prime rate* ones, or premodification, as in *quantitative easing* from *(monetary) easing*.

Terminological variation for stylistic and discursive reasons accounts for the different forms a term may take. In the example below, taken from our English corpus, the following occurrences of *monetary policy tightening* (42 occurrences)and its synonyms and variants can be found:

- its original full form *tightening of monetary policy*(37 occurrences),
- *tight(er) credit conditions*(201 occurrences),
- synonyms and variants *tightening of monetary/credit/financial conditions*(42 occurrences),and
- *tightening in credit conditions*(29occurrences). Besides,
- *tightening credit conditions*(19 occurrences)and
- *tight(er) monetary policy*(16 occurrences).

In the press, the most frequent terms are *tightening lending conditions/standards/criteria* (20 occurrences) and *tight(er) money* (13 occurrences). Occurrences suggest that in this cluster some terms are more prototypical in a given context/register compared to others.

4.2. Secondary term formation

Secondary term formation in economics and finance in Italian is particularly productive. An analysis of economic and financial terms in major Italian dictionaries shows that they come almost exclusively from English, while the dominant source language until the 19th century was French. However, term formation from English poses a number of problems of adaptation to Italian morphology or of transparency of the loan term in Italian (Humbley and García Palacios 2012).

Factors that might affect secondary term formation are the type of target audience and the concept point of entry, while aspects like user experience, product placement and market expectations have some resonance in economics and finance if the prestige of English – especially in its American variety – as the field-specific language, is considered. In the Italian sources of economic information in our corpus, for *monetary policy tightening* we find, in descending order of frequency,

- *restrizione dell'offerta di credito,*
- *restrizione del credito,*
- *condizioni restrittive dell'offerta di credito,*
- *azione(monetaria) restrittiva*

where there is a clear attempt to describe the process while keeping the level of technicality high and the register formal. Conversely, Italian economic textbooks use the gloss-like terms *misure creditizie restrittive* and *politiche monetarie restrittive* with a lower degree of technicality. Finally, in articles from the Italian press we find:

- *politica monetaria restrittiva,*
- *condizioni di finanziamento restrittive*,
- *stretta creditizia* and
- *stretta del/sul credito* or
- the downtoner *condizioni di credito meno favorevoli.*

As can be seen, newspaper and magazine articles exhibit a mixture of gloss-like terms (first two items) with compact, slogan-like terms which are particularly suited to catchy headlines. A much more informal term also exists, *denaro caro*, for the English *tight money*.

Adjustment to target-language morphology also poses interesting problems. A case in point is *perfect* in English as used in s*ubgame perfect Nash equilibrium* and *perfect price discrimination* (also called *first degree price discrimination*). Since no hyphens are added there is no telling that in the former term *perfect* is linked to subgame, while in the latter it modifies price. As a consequence, the former 'translates' as *equilibrio di Nash perfetto nei sottogiochi* whereas the latter is *discriminazione perfetta del prezzo*.

Several translation strategies are used to account for economic and financial terms in other languages as dictated by the degree of transparency of the term. In Italian the following strategies are observed:

- use of hybrids when one component is used or understandable in the target language**:** *corporate level→livello corporate;*
- actual translation: *business analysis→analisi economica;*
- loan translation: *customerization→customerizzazione;*
- loan of full form rather than short form: (En) *cause marketing →*(It) *cause-related marketing.*

Translation can be integrated with and even with an acronym as in *business unit* which is "rendered" in Italian as *area strategica d'affari (ASA)* or *strategic business unit (SBA)*. Clearly, the chosen strategy is a function of the target audience. Finally, strategies are also affected by language-intrinsic factors, such as a preference for abstraction in Italian or the presence of culture-bound collocations. In the following example "levels" are rendered with the more abstract "planning" (*pianificazione*): *organizational levels of strategy →pianificazione strategica di un'organizzazione*. Culture-bound collocations like *bricks and mortar* in the term *bricks-and-mortar businesses* would be largely

opaque in Italian, so the term can be introduced by a gloss for the sake of clarity: *imprese tradizionali, cosiddette bricks-and-mortar***.**

4.3.Diachronic variation

Diachronic variation in economics and finance occurs at different speed as this reflects the evolution of the discipline(s). Domains such as marketing still account for quite a lot of new, creative terminology as innovative selling tactics are developed; finance has to devise new names for new financial strategies or products, whereas in the so-called orthodox economics terms are on average much more stable. An interesting case is *moral hazard,* defined (Black *et al.* 2009) as follows:

> The observation that a contract which promises people payment on the occurrence of certain events will cause a change in behavior to make these events more likely. For example, moral hazard suggests that if possessions are fully insured, their owners are likely to take less good care of them than if they were uninsured. The consequence is that insurance companies cannot offer full insurance. Moral hazard results from **asymmetric information** and is a cause of **market failure**.

Some Italian economists initially suggested *competizione sleale* (lit. 'unfair competition') as an equivalent alongside the loan translation *azzardo morale* – a term that is largely obscure considering the collocation of *azzardo* (risk frequently associated with gambling) and ethics. In the end, *azzardo morale* emerged as the most frequent term and has since become the main, if not the only, term to be used in this context.

In a diachronic perspective, shifts emerge quite clearly. For example, Galbraith (1958/91: 37-8) states that over time, new terms have been devised to describe economic downturns, both to pin down their main cause in each case, and to avoid terms which reminded people of previous crises and had thus acquired negative connotations. In the early 1800s the downturn was termed *capitalist crisis*, but by the late 1800s it was described as a *rolling adjustment* which however resulted in *panic*. When the next crisis broke out in 1929, it was

defined a *crash*, which started with the Wall Street one and whose consequent recession ended up in the notorious depression of the 1930s. The following downturn in 1953-4 was a '*growth' recession* while the latest crisis which started in 2007 was termed a *credit crunch* (less frequently a *credit squeeze*) because it originated from the default of subprime loans in the US and the consequent credit tightening. In Italian, the English loan is still the most frequent term to this day, though in English it is now equally, if not less, frequent than its synonym *credit crisis* or *crisis* for short. The story is summarized in Figure 4.1 below:
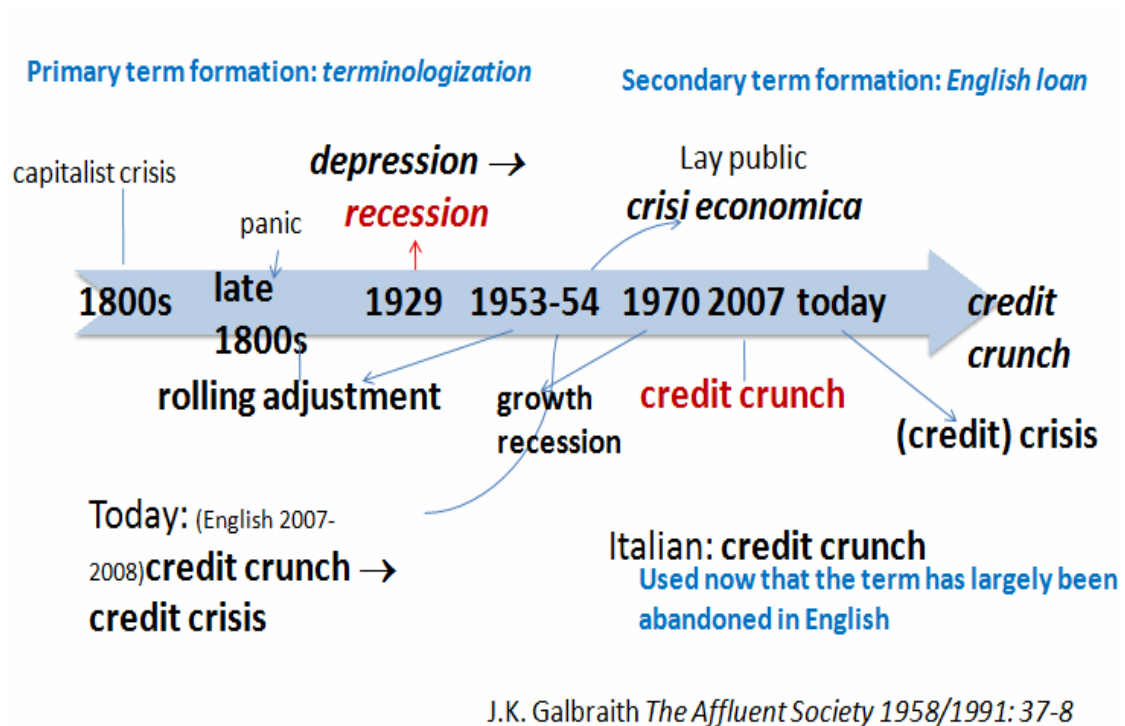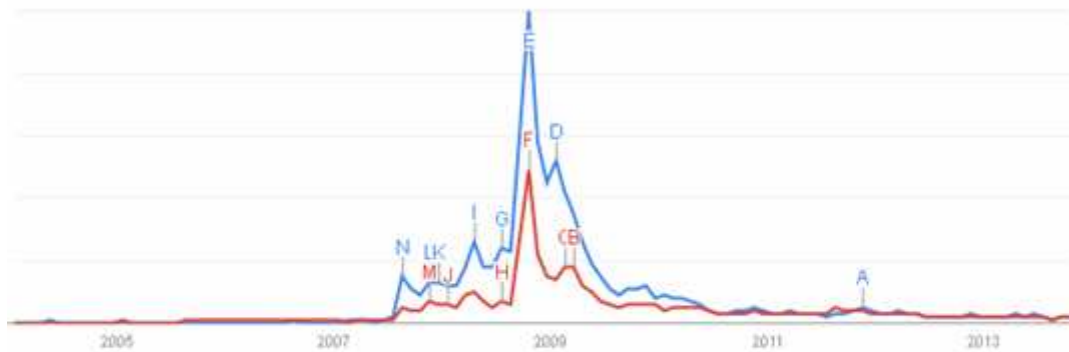

Figure 4.1. Diachronic variation of terms designating economic crises, 1800-2013

The use of *credit crunch* as opposed to *credit crisis* can be compared and contrasted using Google Trend as shown in the following Figure 4.2:

Google Trend : *credit crunch*, *credit crisis*
- All over the world, 2004 - 2013

Figure 4.2. Comparison of the use of *credit crunch* and *credit crisis* (Source: Google Trend, 2004-2013).

As can be seen, *credit crunch* was the most frequent term by late 2007 and had an all-time high in 2009, when its contender, *credit crisis*, also peaked but was not as frequent. Use dwindled in 2010 and by 2011 *credit crunch* and *credit crisis* were equally frequent.

Within the latest – and in some countries still current – crisis, an interesting case of term shift is that of *spread*. In economics, *spread* is generally defined as "[T]he difference between an interest rate and some other, benchmark interest rate" (Lieberman andHall 2013: G-9). In finance, it is more narrowly described as

1. The difference between the bid and offer price made by a **market-maker**on the stock exchange.
2. The diversity of the investments in a **portfolio**. The greater the spread of a portfolio the less volatile it will be.
3. The simultaneous purchase and sale of commodity futures (see **future contract**). In the hope that movement in their relative prices will enable a profit to be made. This may include a purchase and sale of the same commodity for the same delivery, but on different commodity exchanges (see **straddle**), or a purchase and sale of the same commodity for different deliveries.
4. In banking, an **interest-rate margin**. (Law and Smullen 2008)

By the time the latest crisis broke out, *spread* had made the headlines of newspapers and it came to indicate more narrowly the difference

> […]fra i titoli decennali emessi in euro dagli Stati europei, in particolare la differenza fra i Bund tedeschi, considerati come titoli privi di rischio di insolvenza dell'emittente, e i BTP italiani (fig.), i Bonos spagnoli o gli OAT francesi. Gli s. [spread] dei titoli italiani e spagnoli hanno subito una brusca impennata a partire dall'inizio dell'estate del 2011.(Treccani 2012)

In Italian the synonym *differenziale* – instead of the direct equivalent *differenza* – is also used, as pointed out in the *Vocabolario Treccani*(2014). In the annual reports of the Bank of Italy in our corpus, *spread* is used as a loan from English or it is replaced by *differenziale di rendimento* (example below), by *differenziale di interesse* or even by full forms such as *differenziale/differenza tra il tasso di rendimento/interesse e le aspettative*:

> Il differenziale di rendimento tra il BTP benchmark decennale e il Bund tedesco aveva raggiunto valori elevati all'inizio del 2009, risentendo dei riflessi della crisi finanziaria globale; si è poi ridotto di 0,6 punti percentuali nei primi sette mesi del 2009 (fig. 15.1). Gli spread sono tornati però a salire dalla fine di aprile di quest'anno, quando i timori circa la sostenibilità delle finanze pubbliche della Grecia e di altri paesi dell'area dell'euro hanno innescato nuove tensioni sui mercati finanziari; […]. (Bancad'Italia 2009, our corpus)

Strategies of definition in the press reverted to the general meanings of the word, as indicated in the*Sole24 Ore Junior* (Galimberti 2012b: 11), an introduction to economics for teenagers in weekly instalments in the Sunday edition of the newspaper. Some of the acceptations mentioned are (a) the soft substance which you spread on bread to eat; (b) the number of points between the scores of two teams which are used when betting on sports; (c) spread as an area covered when hands, legs or wings are stretched; and even (d) *middle-age spread*, or the bulk of fat round people's waists as they grow older. In yet another *Sole 24 Ore* publication (2013: 24) in a series of booklets on economics for children, *spread* is defined as follows:

> [...] è una parola inglese che vuol dire "divario". Indica la differenza tra quanto rendono i titoli di Stato italiani (BTP) e quanto rendono i titoli di Stato tedeschi (Bund). [...] Se questa differenza è positiva, cioè i titoli italiani rendono di più, vuol dire che i risparmiatori, per comprare i titoli italiani, pretendono un compenso maggiore: l'Italia viene considerata meno "sicura" della Germania, perché ci sono più possibilità che lo Stato italiano entri in crisi.

Some economists have argued that the meaning of *spread* is vaguer now that it is of public domain and it should be re-appropriated by specialists. Perhaps, over time, other terms will be coined for the 'other meanings' of *spread*.

The story of *credit crunch* and *spread* pose interesting questions that can be further explored by looking at other terminology of the latest crisis. Analysis started with reference to a *Guardian* article (19 December 2008) where Julie Kollewe listed the terms which the readers had to know to make sense of the credit crunch. In time, Italian newspapers followed suit: the economic and financial daily *Sole 24 Ore* published supplements on the crisis with corresponding glossaries (2008, 2011, Galimberti2012a) and the newspaper *Repubblica* issued one of its *Affari e Finanza* supplements on the topic (2011). Of the 715 terms which were found in the five glossaries, nine were isolated for study in detail. Criteria for selection were:

- presence of terms in two or more glossaries,
- term formation based on metaphors in either language or both,
- termsrelating to prototypes and establishing complex networks of relationships with other terms.

The list of terms and their distribution in the glossaries is outlined in Table 4.2. below:

The Guardian	*La grande crisi Sole 24 Ore*	*Capire la crisi Repubblica AF*	*Parola chiave Sole 24 Ore*	*Parola chiave per uscire dalla crisi*
19 December 2008	**2008**	**2011**	**2011**	**2012**
Credit crunch	Credit crunch	Credit crunch(restrizione del credito)	Credit crunch (stretta creditizia)	Credit crunch
[securitization]	cartolarizzazione		cartolarizzazioni	cartolarizza-zione/i
	Toxic asset (titoli	titoli tossici		

	finanziari "tossici")			
		deleveraging	deleverage	deleveraging
[bailout]	bailout	bailout	bailout	bailout
	benchmark	benchmark	benchmarking	
Quantitative easing		Quantitative easing	Quantitative easing	
	spread	spread	spread	spread
	subprime	subprime	subprime	subprime

Table 4.2. Terms used to explore the domain of the credit crisis (2007-2012).

Data were then triangulated with our corpus and then compared with the *Corpus of Contemporary American English* (*COCA*, 450 million words). For Italian, data were compared with those from the updated version of the *CORpus di Italiano Scritto* (CORIS, 130 million words).

For reasons of space we shall restrict analysis to *securitization* and *toxic assets*. *Securitization* – a word first found in the English language in the late 20th century –is the process which turns assets into securities:

> Generally this involves an arrangement in which one party (the originator) sells a portfolio of assets, such as house mortgages or bank loans, to a special purpose vehicle (the issuer), who finances the purchase by packaging the cash flows from these assets as tradable financial instruments (securities), which are sold to investors (Law and Smullen 2008).

As can be seen in the following Italian definition, the English term is regarded as obscure in Italian and is only given in brackets (Galimberti 2012a: 23):

> La cartolarizzazione (in inglese *securitization*) è la conversione di crediti in titoli negoziabili. È un'operazione finanziaria con la quale si possono smobilizzare crediti omogenei aventi caratteristiche di rientro diluito nel tempo (mutui, credito al consumo, leasing finanziario o sofferenze) ottenendo liquidità immediata. […] Esistono innumerevoli formule di cartolarizzazione e di attività finanziarie che garantiscono il servizio del debito. (*Vedi Abs*, *Cdo*).

The metaphors from which the English and Italian terms originate are quite different. *Securitization* comes from security, which stands for warranty, but is

used to refer to assets, as the cross-reference to *abs*(or *asset-backed securities*) and *cdo* (*collateralised debt obligations*) indicates. *Cartolarizzazione* derives from the adjective and verb *cartolare*. The adjective refers to a right based on a document that needs to be produced to enforce the right itself. The verb means "assigning numbers to pages of a manuscript" (Zingarelli 2012).

Toxic is normally used in the compound term *toxic asset(s)* and in the much rarer *toxic loan(s)*. These metaphorical terms come from medicine as their synonym *troubled assets*. In Italian, the metaphorical nature of the term emerges from the following definition, where bad debt 'contaminates' bank accounting reports and toxic assets were referred to as *carta straccia* (lit. scrap paper) prior to the latest crisis (*Sole 24 Ore* 2008: 126):

> Toxic asset: titoli finanziari "tossici", composti cioè da crediti inesigibili che "contaminano" i bilanci delle banche e, a cascata, delle società creditrici. I "tossici" sono finiti anche nei portafogli dei risparmiatori. Un tempo sarebbero stati definiti "carta straccia".

In the less specialised supplement *Capire la crisi* (Repubblica2011: 115), the metaphorical elements in the definition are even more evident as toxic assets "have intoxicated the global financial system and made it a seriously ill patient that cannot recover yet":

> Titoli tossici Sono quella massa enorme di titoli strutturati, in genere assai complessi che, distribuiti nei portafogli di banche ed hedge fund, fondi pensione e fondi di investimento, assicurazioni e privati investitori, hanno intossicato il sistema finanziario globale rendendolo un grande malato che ancora non riesce a guarire.

Toxic asset(s)/loan(s) is more frequent in newspapers and magazines in English, while the equivalent *titoli tossici* in Italian is not used at all in sources of economic information – Bank of Italy and ISTAT. The synonym *troubled asset(s)* is more frequent in the IMF and OECD reports as well as in those by the Federal Reserve and the Bank of England.

Usage of the three main terms in English and Italian can be summarised by means of frequencies. When special language texts are contrasted with those of control corpora and with reference corpora show that frequencies are lowest

in the reference corpora. With reference to acceptability of terms, analysis of use in different contexts highlights that it does not exist in a vacuum, but is only decided by use in context.

Economic and finance are not new to retronyms. Newly emerging schools of thought have led to a redefinition of previous ones: what was originally just economics has been redubbed classical economics to distinguish it from neoclassical economics, which is now regarded as orthodox or mainstream economics. Indeed, any term which is associated with classical or traditional is a retronym. A case in point is that of *bricks-and-mortar businesses* above as you can only distinguish traditional companies from others starting from the rise of e-commerce. Economic crises have also spawned some retronyms. After the Wall Street Crash in 1929 inaugurated the *Great Depression*, the downturn in the late 19th century (1873-1893) was renamed the *Long Depression*. The latest crisis has made *creative accounting* a popular retronym used to refer to Greece and its attempts to stabilize its economy.

5. Conclusion

In this paper we combined a synchronic with a diachronic perspective to explore terminological variation both within and across domains in computing, economics and finance. In order to do this, we have investigated terms as sociocognitive "facts" in their language ecosystems, as part of discourse and as they travel from general to special language and back, and from English as the international lingua franca of science and technology to Italian as prototypical of Romance languages. What has emerged is that terms are formed with an eye to the addressees of the texts where they are going to be used, so that they can be said to be co-constructed with the different audiences they are meant for. Our investigation suggests that In the end, it is only by taking a long view – i.e. diachronically – that trends can emerge and terminological variation be made sense of.

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