Consumer Credit Behavior in the Digital Context: A Bibliometric Analysis and Literature Review

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This literature review seeks to map the state of research on the effects of digitization on personal financial behavior and management through a bibliometric analysis and a systematic literature review. The findings indicate that current knowledge is primarily based on perspectives of actors in commerce and systems development. More research is needed on how personal financial behavior change in relation to digital technology, the vulnerability of children and adolescents, and the links between changes in credit behavior and indebtedness. Financial counseling could benefit from an awareness of young adults vulnerability as digital consumers and an extended perception of financial literacy that encompasses requirements of digital society. Policymakers need to be aware of the consequences of digital measurability.

Keywords: bibliometric analysis, consumer-credit behavior, digital technology, literature review

Today, a growing number of people live their lives connected to the Internet and rely on digital technologies for various activities such as socializing with friends, accessing health care information, or paying their bills. According to a report from the United States Census Bureau, 74.4% of all households in the United States reported Internet use in 2013, with 73.4% reporting a high-speed connection (File & Ryan, 2014). In the European Union (EU) countries, on average, 79% of the population between the ages of 16 and 79 years use the Internet on a regular basis (Seybert & Reinecke, 2013). As Internet activities continue to increase, how we consume, borrow money and use credit, and what this entails and requires in terms of skills and knowledge are also undergoing rapid change. The spread of digital technologies, especially mobile phones, has produced new venues with lower entry barriers and fewer gatekeepers for both purchasing and credit management. Online shopping, online banking, in-game trading in games and apps, instant loans, and other forms of easily accessible consumer credit form a new and different landscape for personal financial behavior and management, generating both new challenges but also opportunities for financial counselors and their clients.

These sociotechnical changes have gained the attention of scholars from various research fields—ranging from systems development to consumer culture—all approaching the topic from different perspectives, with different questions and knowledge claims. Bringing together these disparate streams of research could help shed light on what is currently known about the effects of digitization on personal financial behavior, particularly regarding consumer credit behavior. Such knowledge is important for the sake of research but may also have implications for financial counseling practices and for the authorities responsible for countering increases in financial vulnerability and over-indebtedness. Hence, the objective of this literature review is to map the current state of research on the effects of digitization on personal financial behavior and management, with a particular focus on consumer credit behavior, to synthesize the findings so far and suggest directions for future research.

Background

The main motive for this literature review is the high rate of technology-related social changes currently occurring and affecting all parts of society, including personal financial

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behavior and management. Although the structural and technical architecture of the Internet is several decades old, it remains in constant and rapid transformation (Larsson, 2015). It should be noted that the level of Internet usage has not increased drastically over the last few years; however, *how* we are connected has changed dramatically. The Internet has become an integral part of everyday life across diverse parts of society, and the development of new forms of digitally mediated consumer credit behavior can be seen as part of this transformation. Today, shopping online is an everyday experience for most Internet users in the United States (57%) and in many parts of Europe (World Internet Project, 2013). Here, we can distinguish between online shopping and digital purchases. The former is similar to traditional mail-order purchases, where the consumer buys a product on a website which is later delivered to his or her home address. The latter refers to purchases of digital products such as music files, smartphone applications, or media streaming. As e-commerce—the umbrella concept used for describing different forms of digitally mediated trading—continues to grow, several new technical solutions for purchases and payments online have entered the market, such as electronic invoices, intermediary solutions (e.g., Apple accounts and PayPal), and subscription services (e.g., Spotify and Netflix) linked to debit or credit cards. The growth in smartphone use has supported this development and opened up a new world of technologies for various types of purchases and payment transactions, where the mobile phone is the lowest common denominator. Purchases are integrated into some digital games, which suggests that credit-based consumption reaches children relatively seamlessly. Many of these payment forms are linked to installment options or unsecured loans, often with high interest rates. Consumers are thus faced with an intricate set of payment and credit options whose terms and rules are not always easy to comprehend. Hence, as alternatives for purchases and credit become more customized online, financial decision making becomes more opaque and complex.

From this follows that consumers are faced with new and different challenges in digital contexts. In Sweden, a country with a high degree of Internet use and where online shopping is quite common (Findahl, 2014). The Swedish Enforcement Authority (2012) has noted that one of the more common reasons for payment default for people between 18 and 25 years are for invoice purchases and that a large portion of these relate to e-commerce. A recent study

revealed that approximately every fifth young adult experience recurring payment problems (Larsson, Svensson, & Carlsson, 2016) and young people and women are over-represented among payment default in e-commerce in comparison to other types of debt (Swedish Enforcement Authority, 2013). This indicates that e-commerce might lead to individuals entering into precarious financial situations and even over-indebtedness. Financial counselors are thus faced with clients who have problems of a new origin, which suggests that new professional knowledge and skills might be required. As stated earlier, this literature review seeks to shed light on what is currently known about the effects of digitization on personal financial behavior and management, insights that can be used by financial counselors in their work to further understand the implications of digitization.

Method

For the purpose of this study, two substudies were conducted: a bibliometric analysis and a systematic literature review. Both substudies focused on research themes related to personal financial behavior in digital contexts, albeit with somewhat different approaches, to provide as a comprehensive and accurate description. The details of the two methods are described in the following text.

Bibliometrics

Bibliometric analysis is fundamentally concerned with quantitative and statistical analyses of the characteristics of texts and text collections. Today, bibliometrics is primarily associated with research evaluation using publication statistics and the extent to which these are cited as indicators of scientific productivity and impact. However, the method can also be used to identify different structures within a research field by analyzing various properties of the literature within that field. Studying statistical relationships in terminology is one way of identifying various themes within a research field or field of interest. In addition, an analysis of the journals that publish the research, and of the journals the articles refer to, can be used to explore which research fields are examining a given object of study as well as to what extent their results are communicated between various research fields.

To conduct these analyses, data that can be gathered in an efficient and structured manner are required. Research databases contain different types of literature and different types

of publications (e.g., journal articles, monographs, chapters from anthologies, conference proceedings) as well as publications in various languages. There are also large differences in the quality of metadata. This means that depending on which database is used, different aspects of a field's research literature will be analyzed. For the purpose of this study, the Web of Science (WoS) databases produced by Thomson Reuters were selected for the bibliometric analysis. WoS is a set of databases that lists international research literature, in particular journal articles written in English. The WoS also has the advantage of gathering content-rich information, which allows for many types of analyses, as well as enabling efficient compilation of data. The disadvantage is that this focuses on international journal articles runs the risk of omitting research published in other forms, for instance in books, which is common within the social sciences and the humanities. Hence, the results of the analyses come from only a portion of the complete corpus of research literature under analyses and must be viewed with this in mind. Nevertheless, if one wishes to gain an understanding of different aspects within a research field, the advantages of the WoS database continue to outweigh its limitation.

To gather relevant literature for the study at hand, several keywords were identified to formulate search strings for the WoS databases (Science Citation Index, Social Science Citation Index, and Arts & Humanities Citation Index as well as the Conference Proceedings Citation Index). The search strings, presented in the findings section of this article, were formulated according to the theme "indebtedness in digital contexts."

The searches were limited to literature published between 2005 and 2014. The information of the publications identified in the WoS searches was downloaded for further processing and analysis using the software Bibexcel (a program used for processing data and bibliometric analyses; Persson, 2015; Persson, Danell, & Schneider, 2009), VOSviewer Version 1.6.2 (a program for visualizing bibliometric analyses, the initials VOS standing for vicinity of similarities; van Eck & Waltman, 2010; VOSviewer, 2015), and Microsoft Excel.

To map the research fields, that is, to study the effects of digitization on personal financial behavior and management, the focus was on detecting journals that publish this type of research as well as journals cited in the identified literature. In the former analysis, the objective of study was the distribution of articles between various fields. In the latter, the objective of study was the cited references that link to the articles being studied, and in particular, the cited journals (McCain, 1999). The reference lists (the "Cited Reference" field in the WoS data) for the articles were limited to the journal titles and thereafter followed by an analysis of how often the cited journals appeared concurrently in the reference lists. In the findings section of this article, the analyses are represented as maps where journals that are frequently cited are represented as larger units on the maps, whereas journals that are often cited together are placed in close vicinity to each other, thus forming clusters that represent different research fields.

To identify the themes addressed, the terms that appear in the literature were analyzed by studying the titles, abstracts, and keywords. The fields in the WoS data that contain such information were compiled in a text file using Bibexcel and then analyzed in the VOSviewer (van Eck & Waltman, 2011). Initially, the program used an algorithm to identify relevant terms and weed out insignificant words such as *and*, *or*, and so forth. Once the relevant terms were identified, the analysis focused on how often these terms occurred and how often they occurred together. Similarly to the cited journals, the terms are presented in map form in the findings section, where frequently occurring terms are marked as larger units on the maps, whereas terms that frequently occur concurrently are placed closer to each other. This implies that larger collections of terms that frequently occur concurrently form clusters, which will be further illustrated in the findings section.

Systematic Literature Review

The systematic literature review that the second substudy is based on consists of a compilation of relevant literature within a specific area of study. The collection method for such a review is based, as the name suggests, in a carefully developed and systematic methodology for literature searches. For this article, the method's most obvious merit is that it includes a qualitative dimension where much of the systematized literature (although mainly delimited to abstracts) is read and evaluated. This provides a somewhat deeper understanding of the type of research currently being published as well as a good opportunity to highlight significant publications, whether quantitatively representative

or not. As such, the systematic review is a good complement to the bibliometric analysis.

In brief, the systematic search method can be described as a three-stage process consisting of searching, screening, and analyzing. Various databases are selected, preferably based on their relevance to the search and/or the literature review. Because the subject of this research review is by nature broad and can be researched within several disciplines, the searches have in this case been confined to so-called general databases rather than discipline-specific ones. Moreover, the focus was on international scientific databases because the aim here was to specifically identify the international state of research on the effects of digitization on personal financial behavior and management. The Academic Search Complete and Scopus databases were chosen for the search. The Academic Search Complete is owned by EBSCO, which is regarded as one of the leading suppliers of digital academic literature. Scopus is owned by Elsevier, another leading actor on the market for digital academic literature. The Academic Search Complete indexes approximately 23,000 scientific journals, which cover a broad spectrum, ranging from anthropology to engineering and science. Scopus indexes roughly 22,000 scientific journals and also has a broad coverage of fields and disciplines. *The Journal of Financial Counseling and Planning* is indexed in both these databases (Kelley, Lawrence, & Plauche, 2013).

The systematic search method has both strengths and weaknesses. An important strength, in particular for this research review, is the ability to capture the breadth of the research field and provide as comprehensive a description as possible. A further advantage is the repeatability of the search method. Because the search strings are clearly defined, it is possible to repeat the same search at a later time and thereby note any changes within the research field. This approach, however, does have limits, which have implications for the substudy results. When conducting a broader search, the accuracy of a more targeted search is to some extent lost. Furthermore, the selected databases index a specific selection of publications, generally conference proceedings and articles in peer-reviewed journals written in English. Hence, other types of publications containing relevant findings of interest for the research review are excluded from the scope of the search.

This systematic literature review is based on three search strings, which correspond to three different searches.

The first string (hereafter, Search 1) was used to capture hits containing the search term *over-indebtedness*, which initially generated 45 hits in the Academic Search Complete database and 64 hits in Scopus:

overindebt* OR over-indebt* OR (over AND indebt*)

The purpose of this search was to produce a comprehensive overview of the frequency of the term *over-indebtedness* in the scientific publications indexed by the databases as well as to provide an indication of how the term is used in the publications generated by the search.

The second string (hereafter, Search 2) was used to capture hits that combine the main search term *digital* with *consumer* and *indebtedness*. This search initially generated 1,411 hits in the Academic Search Complete database and 828 hits in Scopus:

(debt* OR overindebt* OR over-indebt* OR loan* OR borrow* OR lend* OR credit* OR mortage OR invoice) AND (Digital* OR online* OR electronic* OR cyber* OR internet* OR virtual* OR wired OR e-*)NOT Librar* AND (buy* OR shop* OR consum* OR purchas* OR retail* OR merchandi* OR marketing)

The third search (hereafter, Search 3) was used to capture hits that combine the main keyword *mobile* with *consumer* and *indebtedness*, which initially generated 661 hits in the Academic Search Complete database and 828 hits in Scopus:

(debt* OR overindebt* OR indebt* OR loan* OR lend* OR credit* OR mortage OR invoice) AND (mobile OR cell phone OR Iphone OR android OR application* OR app OR smartphone) NOT Librar* AND (Buy* OR shop* OR consum* OR purchas* OR retail* OR merchandi* OR marketing)

In all three searches, the time span was delimited to between the years 2000 and 2014. All results were saved and systematized in the reference management system Zotero. In the second step of the systematic method, that is, the scanning process, the searches from the respective databases were merged, followed by a screening for any duplicates. Thereafter, the remaining matches were examined manually to exclude any that were not of topical relevance.

Screened hits might, for example, focus on indebtedness at the state and supranational level, microloans in developing countries, or other subjects that were clearly irrelevant to this research review. After the screening, 44 hits were deemed relevant in Search 1, 483 hits in Search 2, and 105 hits in Search 3. After a second screening for duplicates, 166 peer-reviewed publications remained, which form the basis of the analysis in Substudy 2. The third step of the systematic method, the analysis, was conducted via repeated readings of the publications' abstracts. Based on these readings, the articles were coded, and the publications were systematized according to the categories presented in the findings section.

Findings from Substudy 1: Bibliometric Analysis

The theme studied in the bibliometric analysis—indebtedness in digital contexts—is presented in the following text. Search strings are also included in the presentation as well as other delimitations to the searches.

Indebtedness in Digital Contexts

To identify research on indebtedness in digital contexts, the following search string was used in the "Topic Search" field in the Web of Science database, which resulted in 1,472 articles that were then downloaded for processing and further analysis:

(debt* OR indebt* OR overindebt* OR loan* OR borrow* OR lend* OR credit* OR mortage OR invoice)

AND

(Digital* OR online* OR electronic* OR cyber* OR internet* OR virtual* OR wired OR mobile OR cell phone OR Iphone OR android OR application* OR app OR smartphone)

AND

(Buy* OR shop* OR consum* OR purchas* OR retail* OR merchandi* OR marketing OR e-shop* OR e-consum* OR e-purchas* OR e-retail* OR e-merchandi* OR e-marketing*)
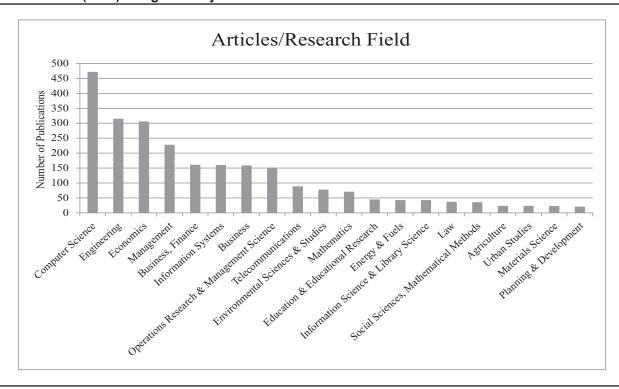
NOT

librar*

To study which fields that research on indebtedness in digital contexts can be identified within, two different types of analyses were conducted. The first analysis focused on the research field where the articles were published. This is represented by the topic categories used by WoS to describe journals that publish the articles indexed in the databases (Figure 1). Of the research fields that have published more than 100 articles, two main fields dominate: Computer science—represented by "computer science," "engineering," and "information systems"—and economy and trade, represented by "economics," "management/operations research," and "business/finance." Within the range of roughly 50–100 published articles, the technical perspective recurs in "telecommunications," but we also find "environmental sciences" and "mathematics," the latter probably reflecting a methodological aspect of the research rather than empirical studies of indebtedness in digital contexts. In general, the most prominently featured research fields in the analysis indicate that research on indebtedness in digital contexts—as represented by the WoS databases—focuses on a systemic perspective rather than a consumer or client perspective. The main concern seems to be how to develop systems and business strategies to protect business owners from losses incurred from insolvent consumers, rather than to research consumers who have become indebted because of overconsumption in a digital context and the impact this may have on their lives. Had this been more salient, it would have been represented by, for example, sociology and other research fields with a greater focus on behavioral aspects.
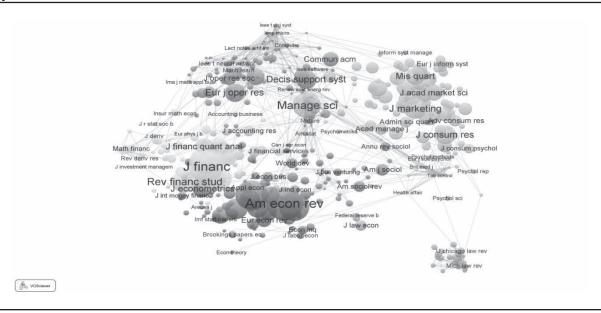
The second analysis of research fields that analyze indebtedness in digital contexts focused on the cited journals, and thereby the scientific context that the authors of the articles place themselves within (Figure 2). In addition to positioning the journals' vicinity based on how often the journals are cited concurrently, these co-citation frequencies are also used to form a statistical cluster analysis, with results represented by different colors for various clusters (McCain, 1999). This way, we find two clusters focused on economics and finance in the lower left section of the map, represented by journals such as the *Journal of Finance* (*J Finance*) and the *American Economic Review* (*Am Econ Rev*). On the right side of the map, we see a cluster of management, marketing, and consumption research journals such as the *Journal of Marketing* (*J Marketing*), *Management Science* (*Manage Sci*) and the *Journal of Consumer Research* (*J Consum Res*). At the top of the map, we see a cluster of journals that are oriented toward

Figure 1. Research fields in which articles on debt in digital contexts have been published, defined as Web of Science (WoS) categories of journals.

Note. Twenty research fields with more than 20 articles (*n* = 122 WoS categories).

Figure 2. Research fields that the author of the article links his or her research to, represented by cited journals.
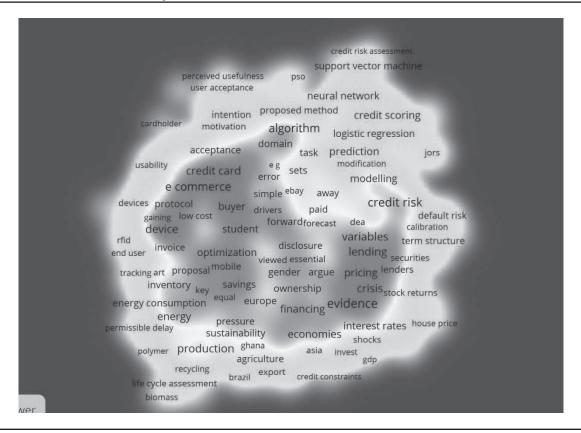

Note. Co-citation analysis, based on the names of journals in the "Cited Reference" field. There are 501 journals that have been cited six times or more. Lines represent 1,000 individual citation links or more.

computer science and system development such as *Decision Support Systems* (*Decis Support Syst*) and *Communications of the Association for Computing Machinery* (*Commun ACM*). The analysis corresponds well with the results of the analysis of the dominant journal categories that publish the analyzed articles. However, it should be noted that the presence of journals that focus on consumer research might indicate a more consumer-oriented research than was apparent in the analysis of journal categories. This perspective is made particularly salient by the two smaller clusters in the co-citation analysis: a cluster of sociological journals between the economy cluster and the marketing cluster, and a small cluster of psychology-oriented journals immediately below the marketing cluster. Moreover, there is also a cluster representing legal journals in the bottom right corner, which were represented to a lesser degree in the analysis of journal categories.

What conclusions can be drawn from this? The economic/business perspective appears to be dominant in both analyses, in conjunction with a more technical, system-oriented perspective. The consumer perspective, however, only becomes apparent in the analysis of the journals that are cited together. The question is to what extent this actually involves research from the consumer's perspective or whether it concerns research that is more system or market oriented and, to a certain extent, uses findings from consumer behavior research? To answer this question, it might be useful to more closely study the actual terms used and to describe the contents of the actual articles; that is, not only study which fields are conducting research on debt in digital contexts but also examine what is actually being said.
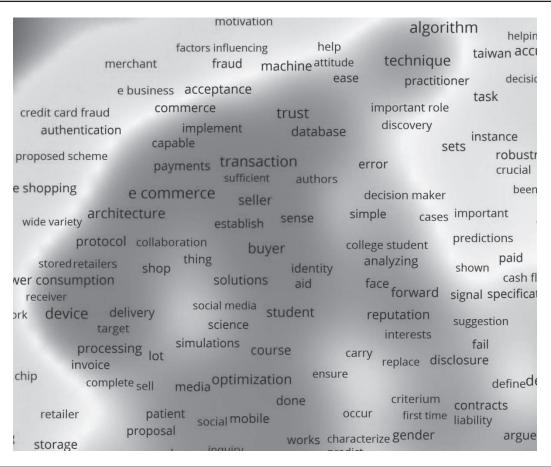
To study the themes that emerge in articles on indebtedness in digital contexts, the article titles and abstracts were analyzed, as were the subject terms used to describe the articles. Similarly to the co-citation analysis, this analysis is then represented by a map of terms where words that frequently occur together are positioned closer to each other than terms that occur together less frequently. This regularity of concurrent use of terms was also analyzed using a statistical cluster analysis (Figure 3).

Figure 3. Terms in articles on indebtedness in digital contexts, based in frequency of concurrent use of terms in titles, abstracts, and keywords.

Note. There are 930 terms appearing five times or more.

Figure 4. Cluster of terms related to commerce.

Note. Detailed zoom-in map of terms in Figure 3.

As was shown in the analyses of research fields, the main focus would again appear to be on the business perspective, although based partly in a technical perspective and partly in a business and financial perspective. The terms largely reflect issues concerning how to evaluate creditworthiness and how to avoid outstanding payments. However, few terms appear to address research on the consequences for consumers or cases of them falling into indebtedness.
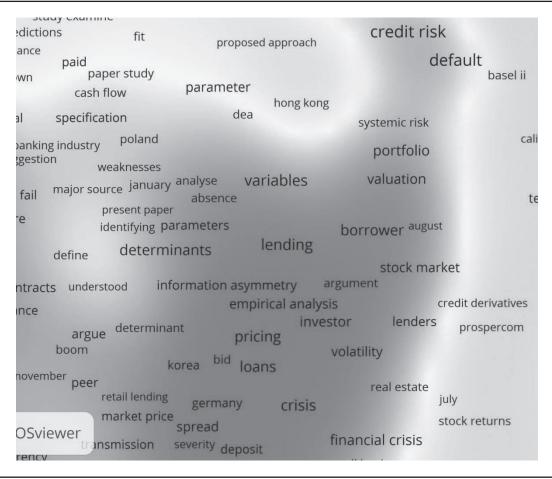
There are two main clusters on the center of the map, both represented by darker fields. To the left, we find a cluster oriented toward commerce with quite a strong focus on infrastructure, business processes, and technology solutions for commerce and payments in digital contexts (Figure 4). Among other things, one can note that "trust" occupies a relatively large space. However, it largely appears to be concerned with how to create reliable and secure trading systems from a technical perspective rather than a more comprehensive concept of trust that would include a consumer or client perspective.

The second cluster on the right side of the map contains terms strongly related to risk assessment and management, not least regarding credit assessment (Figure 5). Here, too, the focus is largely a business perspective rather than any sort of client or consumer perspective; that is, "risk" mainly implies the risk that the businessman and the lender runs of not receiving payment rather than the financial risk of digital consumers.

To find terms related to a consumer perspective, one needs to zoom quite far into the map to find terms that are used relatively infrequently. Even there, the focal point of the consumer perspective is linked to the use of technical systems rather than to the effects of e-commerce on consumers (Figure 6).

In other words, the analysis of the terms used in research on indebtedness in digital contexts supports the analysis of journal categories as defined by those research fields that conduct such research, rather than trends in the co-citation

Figure 5. Cluster of Terms Related to Risk Management and Credit Assessment.

Note. Detailed zoom close-up displayed in the term map in Figure 3.

analysis that appear to point to a more consumer-oriented perspective.
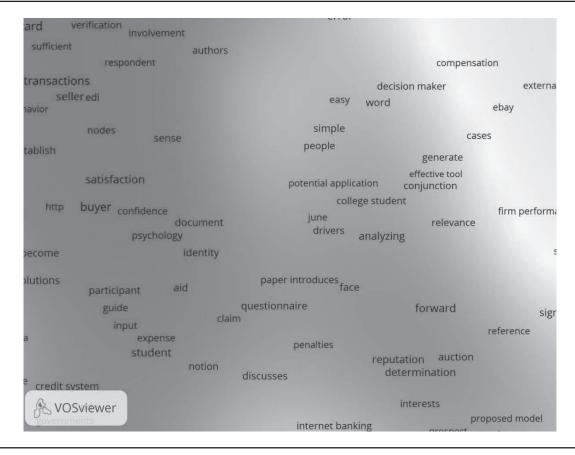
Summary of Substudy 1

Studies of international research on the effects of digitization on consumer credit behavior, as represented by articles indexed in the WoS databases, demonstrate some relatively clear characteristics. First, the focus is on computer systems and commerce rather than on consumers and consumer behavior, which suggests that an economic-/business-oriented perspective is dominant. These findings are further supported by the terminology analysis, which indicates an emphasis on research concerning foremost technical, commercial, and financial aspects such as assessment of credit-worthiness and avoidance of outstanding payments. Second, the amount of research on consumer cultures and behavior in digital contexts, which largely focuses on the opportunities for a well-functioning electronic commerce, is striking.

This suggests that to the extent that research on consumers and their behavior can be identified, such research generally addresses risk behaviors. The focus appears to be on questions such as "How do we design systems for e-commerce?" or "How do we avoid not getting paid?" Hence, research on the effects of digitization on consumer credit behavior, from a consumer perspective, is largely lacking.

Findings from Substudy 2:
Systematic Literature Review

To present the results from Substudy 2 in a perspicuous manner, the included articles have been divided into eight categories, each of which deals with a research topic that is predominant in the literature. The first category "over-indebtedness" is based solely on Search 1, whereas the other categories are based on Searches 2 and 3. Table 1 indicates the number of included publications per search for each category as well as the aggregate number of results

Figure 6. Cluster of Terms Related to User Perspective

Note. Detailed zoom close-up displayed in the map of terms in Figure 3.

after having screened for duplicates. This is then followed by a summary of the category's most prominent research themes with illustrative examples of arguments and results in the included articles.

Over-Indebtedness

As mentioned in the methods section, the purpose of a general search for the term *over-indebtedness* was to form a comprehensive understanding of the term's prevalence in the scientific publications indexed by the selected databases. Furthermore, the opportunity to obtain an understanding of how, and in which situations, the term is used in the articles and conference proceedings was of interest. Therefore, the purpose was to gain an understanding of whether, and if so, to what extent, digital development and consumption patterns in digital society are linked to over-indebtedness issues in contemporary international research. Listed in the following text are four search themes that recur in the material: (a) the changing consumer credit market, (b) causes

of over-indebtedness, (c) financial literacy, and (d) over-indebtedness and health issues.

The positive and negative impacts of the changing consumer credit market on the individual consumer's financial situation are addressed most articles. In particular, they address the European markets and EU laws and regulations surrounding consumer credit. Differences between EU countries in managing increasing over-indebtedness problems are also emphasized. Ramsay (2012) highlights, among other things, the differences between the responses in the United Kingdom and France to what he describes as a marked increase in overindebted individuals in both countries from the mid-1980s onward. He notes that the differences in the countries' responses can largely be explained by historical factors, ideological differences, and how much influence is allotted to the various interest groups in the problem management process. Over-indebtedness is also depicted from a Finnish perspective (Raijas, Lehtinen, &

TABLE 1. Search Categories and Numbers

Category	Search 1	Search 2	Search 3	Number of Duplicates	Total
Over-indebtedness	44	0	0	0	44
Economy, finance, and management	0	14	21	15	20
Systems development and data management	0	42	60	42	60
Marketing and consumption	0	20	28	20	28
Law	0	2	0	0	2
Medicine and psychology	0	2	6	2	6
Social work and welfare research	0	2	3	2	3
Financial literacy	0	0	3	0	3

Leskinen, 2010), whose focus is on finding instruments to both prevent and manage over-indebtedness issues.

One issue that pervades these and other publications that address the changes in the consumer credit markets is the cause of over-indebtedness. In particular, this concerns whether the basic cause for these changes can be found at the micro or macro level as well as understanding the contextual relationship between the state, the market, and the individual. The impact of the financial crisis on personal financial behavior is mentioned as well as the increased responsibility and need for a higher degree of knowledge, regarding financial literacy, that a deregulated consumer credit market requires of the individual.

The significance of financial literacy for the prevention of over-indebtedness is an area that is explored in several articles (e.g., Chlouba, Šimková, & Němcová, 2011; Reifner & Herwig, 2003; Tomášková, Mohelská, & Němcová, 2011). Tomášková et al. (2011) define financial literacy as "a set of knowledge, skills and attitudes of citizens necessary to financially secure themselves and their family in contemporary society" (p. 366). A mutual starting point for the articles is the increasing need for these types of knowledge and skills in conjunction with the consumer credit market as well as the market for private financial solutions in general, having grown increasingly complex. One theme found in the articles that concerns how different e-tools can be used to teach financial literacy online (Chlouba et al., 2011) is of particular interest for this research review. There are also some articles that adopt a critical perspective to financial literacy (e.g., Walker, 2012). The argument here is that this

perspective places too much responsibility on the individual because a lack of knowledge, or problematic consumption patterns, are considered to be overly simplistic explanations for severe indebtedness (Frade, 2012; Walker, 2012). Rather, structural factors, such as the financial crisis and the changing consumer credit market, as well as less value-laden individual factors such as changes in economic situation following death or divorce, should be taken into consideration (Rueger, Schneider, Zier, Letzel, & Muenster, 2011).

Physical and mental health issues are also noted as causes of over-indebtedness. However, these factors are likewise mentioned as an effect of a lifestyle burdened with severe financial problems. For example, Rueger, Weishaar, Ochsmann, Letzel, and Muenster (2013) show links between over-indebtedness and health problems related to increased smoking, Ochsmann, Rueger, Letzel, Drexler, and Muenster (2009) found links to back pains, and Münster, Rüger, Ochsmann, Letzel, and Toschke (2009) link over-indebtedness to obesity.

Various perspectives on the causes and consequences of over-indebtedness emerge in the literature. However, no links are made between changes in consumer behavior in digital society and over-indebtedness, and/or problematic indebtedness in private individuals, which is of interest for this literature review. Explanations for this may, of course, be found in the study's methodological limitations and/or in the absence of actual empirical links. Based on the results of the bibliometric study, a more probable explanation is that research on over-indebtedness and research on digital development and its consequences are conducted within

disciplines that share few points of contact. This explanation is reinforced by the results of the searches directed specifically toward the terms *digital* and *mobile*, as presented in the following.

Economy, Finance, and Management

The topics covered in the articles categorized under this heading address online banking, digital processing of loan applications, mobile payment models, and management of credit risk in relation to e-commerce. In all cases, the perspective adopted is that of private commerce, banks, or other lenders. Although potential customers and debtors are included within the focus of research, the consumer perspective is not the objective of study. Articles that address online banking do, however, study bank customers' trust in these services as well as factors that influence customers' choices when purchasing a service or not (Zhou, 2012). However, the main focus is the bank's potential profits from Internet services, which include financial, organizational, and marketing aspects. This also applies to the example of research on digital processing of loan applications (Malm, 2005) included in the materials and management of credit risks in relation to e-commerce (Huang, Chen, & Wang, 2007; Wang, Li, & Lin, 2013). In addition to these themes, there are also studies that have a greater systems development–oriented focus, such as the following example, which focuses on whether so-called mobile banking services (e.g., the bank as a mobile application) can be integrated with existing banking systems (Moloo, Kissoon, Louise, & Cootthen, 2010).

The mobile payment models that are addressed in the category's articles provide one interesting clue that may indicate new directions in research on changing consumer behavior in the wake of digital technology. Polasik et al. (2012) and others explore whether mobile payments can be considered to be as efficient as cash payments and conclude that, in fact, they can. Thair, Luo, and Summons (2010) demonstrate that e-commerce consumers accept mobile payment systems to the same extent as traditional online payment systems such as PayPal, whereas an older article (Herzberg, 2003) identifies mobile payments security as high.

Also included in the materials is an article entitled "New Architectures for Financial Services," which provides a more comprehensive overview of the new business opportunities that have been developed as a result of financial and credit

market changes. These changes are related to globalization, deregulation, and the emergence of new information and communication technology (Kumar & van Hillegersberg, 2004). The article primarily discusses the interplay between these changing factors at a more comprehensive, structural level. There is a need for more research on the implications that this interplay has at a micro level in everyday life, with a particular focus on changes in consumer credit behavior.

In summary, the research presented in this category confirms the results of the bibliometric review. Research on the opportunities created by digital technology in the credit and financial market rarely adopts a consumer perspective; neither does it link to the emergence of potential, financially difficult situations for the individual in this context.

Systems Development and Data Management

The articles categorized in this section address issues that in various ways focus on technical aspects of digital consumption and credit. A significant number of the articles present solutions for online payment services and for various forms of mobile payment and digital money management systems. The web designs of various e-commerce websites are also studied (Fang & Salvendy, 2003). How to construct systems or design websites to project trust and confidence in digital financial services to potential customers (e.g., Antonakis & Sfakianakis, 2010; Chung & Kwon, 2009) is the topic of several articles. In many cases, potential trust and confidence issues are linked to secure data management and secure payment systems for data management. Here, the articles present suggestions for secure systems to counteract fraud (e.g., Chang, 2013; Das, Saxena, & Gulati, 2005; Venkataramani & Gopalan, 2007; Wopperer, 2002). One suggestion that deserves special attention concerns so-called bioidentification, "biometrics" (Gordon & Sankaranarayanan, 2010).

Another prominent research theme in the articles categorized in this section is the various opportunities created by digital technology to analyze customer behavior and customer credit. Most of the authors note that competitive advantages can be created by large-scale analysis of the digital traces consumers leave behind at various sites, so-called "data mining" (e.g., Blake, 2006; Hsieh, 2004; Kruppa, Schwarz, Arminger, & Ziegler, 2013). The massive amount of data generated by their traces, often known as "big-data," is described as a good basis for credit assessments (Huang

et al., 2007). However, a more critical perspective of this form of data use is sorely lacking. Little attention is paid here to privacy issues; rather, data mining and big data are addressed primarily as new opportunities to create competitive advantages and new profit possibilities by mapping customers and/or borrowers' online behavior.

The absence of a more critical perspective of data mining and big data can be explained by the fact that in this category, too, most studies clearly adopt the perspective of the businessman, the bank, or of some other lender. The stated primary driving force for building secure e-commerce systems and creating attractively designed websites for e-commerce and information architecture is to increase this form of commerce. The negative effects of increasing digital commerce for the consumer are not discussed to the same degree.

Marketing and Consumption

The articles categorized under this heading address new online consumer behaviors in various customer groups. There is also some research on "credit card behavior," that is, how various consumer groups manage and use credit cards. For example, Fagerstrøm and Hantula (2013) study credit card debt in college students in the United States. In their study, a group of students chose between (a) saving a substantial sum of money to buy a new, more desirable, well-known brand of mobile phone or (b) buying the phone on credit and receiving it directly in hand but at a high credit rate (almost 40%). The study demonstrates that students who are more accustomed to credit cards more frequently chose the latter option. However, the researchers conclude that the option to directly gain ownership of a much awaited product was the primary driver for the students to accept credit at a very high interest rate.

Jahankhani (2009) studies how consumers manage various perceived risks in e-commerce situations, such as identity theft and so-called "phishing." The author states, however, that online consumer behavior is still a fairly meagerly researched area, which needs additional academic attention. This is also pointed out by Rahman, Rezaul, and Hossain (2009), who explore how consumers' trust in e-commerce influences their online purchasing and consumer behavior. It should be emphasized that both articles were published in 2009 and therefore cannot be said to provide a precise overview of the current state of research. The results generated

in the present substudy, however, confirm their findings. Only a few articles included in the material specifically address online consumer behavior, which may, of course, be a result of the study's limitations.

It can be noted that the results of the bibliometric study are once again confirmed. Issues such as financial difficulties linked to e-commerce or consumer or credit behavior in digital contexts receive little attention in any of the included articles.

Law

The materials contain only two articles that can be said to deal with matters of a legal nature. One possible explanation for this is that research within this field is published through other channels than those indexed in the databases used in the study. "Law" is defined, however, as a specific subject area included within the Academic Search Complete.

In the first article (Hector, 2011), the author notes that mobile technologies and the Internet are increasingly used as tools to collect debts and also identifies several problems that emerge in the wake of this development, including privacy issues and new forms of fraud. As such, the article demonstrates the problems that may arise when law falls out of pace with technological developments in various debt issues.

The second article "To Be or Not to Be Electronic Money, That's the Question" (Schudelaro, 2003) problematizes the definition of electronic money, as defined by the European Electronic Money Directive. The focus of the study is on whether mobile phone credit can be said to constitute electronic money. Because the article was published in 2003, it is possible that this specific directive is no longer applicable; however, the issue of how electronic money should be defined continues to be of interest.

Medicine and Psychology

Despite the title of this category, most articles categorized under this heading address issues related to psychology. One interesting example is an article by Xiao, Tang, Serido, and Shim (2011), which examines the psychological processes that may explain so-called risky credit behavior in young adults in the United States. Although the definition of "psychological processes" is somewhat unclear, the authors draw the conclusion that parental norms and socioeconomic

status are important factors that affect young adults' credit behavior. It is further concluded that subjective financial literacy is a better prevention for risky credit behavior than objective financial literacy. An additional example is demonstrated in another study that explores the relationship between cognitive ability and the ability to make deliberated decisions in one's personal finances (Agarwal & Mazumder, 2013). Not surprisingly, the conclusion is that those respondents with higher results on the cognitive tests in the study also made fewer mistakes in their personal finances. In summary, there are few results to report in this category, and therefore, it is difficult to conclude more general features.

Social Work and Welfare Research

Only a small number of articles have been placed in this category, which means that it is difficult to describe more general features. One possible explanation for why so few articles were retrieved here is that research conducted within this category is published through channels that are not indexed by the databases used in this study.

The three articles placed in this category address debt settlement or debt counseling (Xiao & Wu, 2008), credit card use among tomorrow's older adults (Apostolova & Gehrt, 2000), and how information on financial support is searched for online (Doyle, 2012). Of particular interest is the article by Xiao and Wu (2008), which examines factors that influence whether a consumer completes a debt settlement or not. Their study shows that the consumer's personal attitude and intentions have great importance to the outcome of the process. A consumer with a positive attitude who intends to complete the process does so to a greater extent than consumers with the opposite attitude. Similarly, they also find indications in the material that the debt counselor's attitude as well as the consumer's perceived control of the situation also affects the process outcomes.

Doyle's article "Playing the Numbers: Searching for Help" is of interest from a digital research perspective. The author explores how Google searches for financial support conform to, as well as depart from, authorities' and other organizations' official timelines for applications for financial support. The issues concerning the interaction between access to, and understanding of, online personal financial information and financial literacy could be developed further.

Financial Literacy

The articles categorized in this section have already been mentioned in relation to the research themes discussed earlier. Therefore, they differ thematically but share in common that they highlight the importance of financial literacy. Xiao and colleagues' (2011) study is discussed in the "Medicine and Psychology" section. This study examines the psychological processes that could explain so-called risky credit behavior in young adults in the United States. One conclusion the authors draw is that so-called subjective financial knowledge, that is, knowledge acquired through one's own experiences, is better equipped to prevent risky credit behavior than objective financial knowledge, that is, knowledge acquired through various training programs. The article by Agarwal and Mazumder (2013) was also mentioned in the "Medicine and Psychology" section and demonstrates the links between good mathematical knowledge and a higher degree of financial literacy. The "Over-Indebtedness" section references Chlouba et al. (2011). Their article presents a study of digital interactive training in financial literacy, which aims to teach consumers how to act in certain personal financial situations that may arise.

Summary of Substudy 2

Regarding international research on the effects of digitization on consumer credit behavior, as represented by articles and conference proceedings indexed in the Academic Search Complete and Scopus, several strengths and weaknesses can be identified. First, over-indebtedness appears to be a relatively well-researched phenomenon. However, there is little research on links between changing consumer behavior in digital society and the over-indebtedness and/or financial vulnerability of private individuals. Second, technical aspects of digital consumption and credit, such as online banking, digital management of loan applications, online payment services, management of credit risks in e-commerce, and mobile payment models and systems also appear to be well researched. However, the perspective is usually that of the businessman, bank, or other lender, which leads to a lack of more critical perspectives on the impact of digitization on personal financial behavior and management. Third, legal research, research in medicine and psychology, and financial literacy are not present to the same degree in the analyzed corpus. This could partly be explained by the limitations of the databases used for the search.

In summary, the results of Substudy 2 confirm the results of the bibliometric study. Research on consumer credit behavior and research on digital development are often conducted within different disciplines that share few points of contact. One consequence of this is that research on the opportunities created by digital technology in the credit and financial markets is not linked to personal financial difficulties. The relationship between these areas, therefore, deserves further attention from the scholarly community.

Conclusion

The purpose of this literature review is to map the current state of research on the effects of digitization on personal financial behavior and management, with particular focus on consumer credit behavior. The findings from both substudies reveal weaknesses as well as strong areas in this field of research.

The bibliometric as well as the systematic analyses show that technical aspects of digital consumer credit behavior—such as online banking, digital management of loan applications and online payment services, credit risk management in relation to e-commerce, and mobile payment models—are well-researched phenomena in the international research literature. To a large extent, this research focuses on how to create systems for commerce, which are technically reliable and secure, and as such encourage online shopping. In this context, much focus is directed toward trust in the context of e-commerce. However, a broader concept of trust that also includes a consumer perspective is largely lacking (cf., Larsson & Runesson, 2014). The conclusion to be drawn from these findings is that what is currently known about the effects of digitization on consumer credit behavior is primarily based on the perspective of actors involved in commerce and systems development. Hence, there is a need for more research on how personal financial behavior may change in relation to the development of mobile and digital technology.

In particular, the vulnerability of children and adolescents as digital consumers needs further attention. In the analyzed corpus, young adults are repeatedly mentioned as particularly susceptible to the effects of digitization both as consumers and borrowers. These findings of financial vulnerability among young adults are consistent with findings from previous research on different aspects of the financial behavior of this group. For instance, Lim, Heckman, Letkiewicz, and Montalto (2014) point to financial stress among college students because of escalating student loans. Kim and Chatterjee (2013) argue that young adults often have little experience of managing their personal finances and underline the importance of childhood financial socialization. Hence, because of their financial inexperience, it has been suggested that young adults are in need of special financial training (Lusardi, Mitchell, & Curto, 2010; McCormick, 2009; Mimura, Koonce, Plunkett, & Pleskus, 2015). At the same time, young adults are seen as being empowered in their capacity as consumers because of digital technology because they are considered especially digitally literate (Palfrey & Gasser, 2008). Research on how children and young adults act as digital consumers could be further developed, both regarding the potential threats and opportunities that technological development entails for this group.

The literature review indicates that fairly extensive research has been conducted on over-indebtedness. It shows, among other things, that there are many paths that lead into this complex financial situation and that over-indebtedness both influences and is influenced by our health. However, little is yet known about how the changes related to digital society affect conditions of personal finances. International research on the impact of instant loans and consumer credit on individuals and society is an important exception. This stream of inquiry indicates that new online credit opportunities via the mobile phone can lead to problematic indebtedness in young adults. In particular, the risks appear to increase for individuals in this group who are already in a precarious financial situation (Autio, Wilska, Kaartinen, & Lähteenmaa, 2009). Previous research on credit card use and misuse in this age group shows similar results (Robb & Sharpe, 2009). Still, instant loans and consumer credit are only a part of the digital credit and consumer ecology. Potential links between changing credit behavior in digital society and over-indebtedness and/or problematic indebtedness in private individuals need to be more thoroughly investigated.

Suggestions for Future Research

The results of this literature review give rise to several ideas on how to further develop research on personal financial behavior in digital society. First, there is a great lack of research on the potential links between changing consumer behaviors in digital society and over-indebtedness and/or problematic indebtedness in private individuals. An

interdisciplinary approach with the capacity to broadly explore this problem area from several perspectives to complement previous research is needed. Second, consumer behavior in digital contexts, in particular the vulnerability of children and young adults as digital consumers, is a field in need of further attention from the scholarly community. Young adults are a group poised to enter adulthood with all its financial obligations and opportunities. At the same time, they find themselves at the epicenter of technological development. To explore the effects of digitization on consumer credit behavior within this age group should therefore be of particular interest. Third, financial literacy is central to contemporary credit society but education and counseling have shown to have little or no impact on long-term financial behaviors (cf., Hensley, 2015). More studies that also take digital development into account and investigate the new skills required for the digital consumer in credit society is needed to further understand the conditions for personal financial behavior and financial literacy education in digital society.

Final, digitization entails a tremendous opportunity for tracing the individual and measuring large quantities of data, such as consumer behavior, but also credit behavior and potential, individual credit circumstances. It enables targeted advertising in ways that are more invasive than ever before. Research in the area of digital measurability that relates to over-indebtedness and consumption is predominantly concerned with how useful big data is for measuring consumer behavior. However, to what extent this leads to increased vulnerability in the already vulnerable, for example, through "predatory lending," is an area in pressing need of research.

Practical Implications

This literature review has shown that there is a need for more research-based knowledge of the effects of digitization on personal financial behavior. From this, follows that further investigations are also required to more fully understand the role and challenges of financial counseling in digital society. Still, the findings indicate some directions that financial counseling might take to counter their clients' digital problems. First, not only an awareness of the opportunities but also the threats that young adults encounter as digital consumers could help shape the advice given to this particular group. Second, consumer educators could benefit from an expanded notion of financial literacy that

takes into consideration the knowledge and skills required for consumers in digital society. Third, digital measurability makes consumers more exposed and allows them to be monitored. Policymakers need to be aware of this to protect individual privacy by informing the public and possibly through legislation.

References

Agarwal, S., & Mazumder, B. (2013). Cognitive abilities and household financial decision-making. *American Economic Journal: Applied Economics*, *5*(1), 193–207. http://dx.doi.org/10.1257/app.5.1.193

Antonakis, A. C., & Sfakianakis, M. E. (2010). Electronic systems of trust in retail lending: New application areas. *International Journal of Applied Systemic Studies*, *3*(3), 283–291. http://dx.doi.org/10.1504/IJASS.2010.034622

Apostolova, E., & Gehrt, K. C. (2000). Credit card use and abuse by today's and tomorrow's elderly. *Journal of Nonprofit & Public Sector Marketing*, *7*(1), 25–49. http://dx.doi.org/10.1300/J054v07n01_03

Autio, M., Wilska, T. A., Kaartinen, R., & Lähteenmaa, J. (2009). The use of small instant loans among young adults: A gateway to a consumer insolvency? *International Journal of Consumer Studies*, *44*, 407–415.

Blake, B. (2006, April). A data warehouse approach to analyzing all the data all the time. In *Proceedings of the 2006 ACM/IEEE Conference on Supercomputing*. Tampa, FL: Institute of Electrical and Electronics Engineers. http://dx.doi.org/10.1145/1188455.1188733

Chang, T. K. (2013, October). A secure cloud-based payment model for m-commerce. In *Proceedings of the International Conference on Parallel Processing* (pp. 1082–1086). Lyon, France: Institute of Electrical and Electronics Engineers. http://dx.doi.org/10.1109/ICPP.2013.129

Chlouba, T., Šimková, M., & Němcová, Z. (2011). Application for education of financial literacy. *Procedia—Social and Behavioral Sciences*, *28*, 370–373. http://dx.doi.org/10.1016/j.sbspro.2011.11.070013.129

Chung, N., & Kwon, S. (2009). Effect of trust level on mobile banking satisfaction: A multi-group analysis of information system success instruments. *Behaviour & Information Technology*, *28*(6), 549–562. http://dx.doi.org/10.1080/01449290802506562

Das, M. L., Saxena, A., & Gulati, V. P. (2005, January). *A security framework for mobile-to-mobile payment network.*

Paper presented at IEEE International Conference on Personal Wireless Communications, New Delhi, India. http://dx.doi.org/10.1109/ICPWC.2005.1431379

Doyle, W. R. (2012). Playing the numbers: Searching for help. *Change*, *44*(4), 42–44. http://dx.doi.org/10.1080/00091383.2012.691864

Fagerstrøm, A., & Hantula, D. A. (2013). Buy it now and pay for it later: An experimental study of student credit card use. *Psychological Record*, *63*(2), 323–332. http://dx.doi.org/10.11133/j.tpr.2013.63.2.007

Fang, X., & Salvendy, G. (2003). Customer-centered rules for design of e-commerce web sites. *Communications of the ACM*, *46*(12), 332–336.

File, T., & Ryan, C. (2014). *Computer and Internet use in the United States: 2013* (ACS-28). Washington, DC: United States Census Bureau.

Findahl, O. (2014). *Svenskarna och Internet* [The Swedes and the Internet]. Stockholm, Sweden: Internet Foundation in Sweden.

Frade, C. (2012). Bankruptcy, stigma and rehabilitation. *ERA Forum*, *13*(1), 45–57. http://dx.doi.org/10.1007/s12027-012-0249-9

Gordon, M., & Sankaranarayanan, S. (2010, September). *Biometric security mechanism in mobile payments*. Paper presented at the 7th International Conference on Wireless and Optical Communications Networks, Colombo, Sri Lanka. http://dx.doi.org/10.1109/WOCN.2010.5587318

Hector, C. (2011). Debt collection in the information age: New technologies and the fair debt collection practices act. *California Law Review*, *99*(6), 1601–1633.

Hensley, B. J. (2015). Enhancing links between research and practice to improve consumer financial education and well-being. *Journal of Financial Counseling and Planning*, *26*(1), 94–101.

Herzberg, A. (2003). Payments and banking with mobile personal devices. *Communications of the ACM*, *46*(5), 53–58.

Hsieh, N. C. (2004). An integrated data mining and behavioral scoring model for analyzing bank customers. *Expert Systems With Applications*, *27*(4), 623–633. http://dx.doi.org/10.1016/j.eswa.2004.06.007

Huang, C. L., Chen, M. C., & Wang, C. J. (2007). Credit scoring with a data mining approach based on support vector machines. *Expert Systems with Applications*, *33*(4), 847–856. http://dx.doi.org/10.1016/j.eswa.2006.07.007

Jahankhani, H. (2009). The behaviour and perceptions of on-line consumers: Risk, risk perception and trust. *International Journal of Information Science and Management*, *7*(1), 79–90.

Kelley, R. N., Lawrence, F. C., & Plauche, H. P. (2013). Increasing influence of the *Journal of Financial Counseling and Planning*: Documentation of indexing in prominent databases. *Journal of Financial Counseling and Planning*, *24*(2), 3–4.

Kim, J., & Chatterjee, S. (2013). Childhood financial socialization and young adults' financial management. *Journal of Financial Counseling and Planning*, *24*(1), 61–79.

Kruppa, J., Schwarz, A., Arminger, G., & Ziegler, A. (2013). Consumer credit risk: Individual probability estimates using machine learning. *Expert Systems with Applications*, *40*(13), 5125–5131. http://dx.doi.org/10.1016/j.eswa.2013.03.019

Kumar, K., & van Hillegersberg, J. (2004). New architectures for financial services. *Communications of the ACM*, *47*(5), 27–30.

Larsson, S. (2015). *Metaforerna, rätten & det digitala. Hur gamla begrepp styr förståelsen av nya fenomen* [Metaphors, law & the digital society. How old terms control our understanding of new phenomena]. Malmoe, Sweden: Gleerup's Education.

Larsson, S., Runesson, P. (Eds.). (2014). *DigiTrust: Tillit i det Digitala. Tvärvetenskapliga perspektiv från ett forskningsprojekt* [DigiTrust: Trust in the digital society. Interdiciplinary perspectives from a research project]. Lund, Sweden: The Pufendorf Institute for Advanced Studies.

Larsson, S., Svensson, L., & Carlsson, H. (2016). *Digital consumption and over-indebtedness among young adults in Sweden* (LUii reports, Vol. 3). Lund, Sweden: Lund University.

Lim, H., Heckman, S. J., Letkiewicz, J. C., & Montalto, C. P. (2014). Financial stress, self-efficacy, and financial help-seeking behavior of college students. *Journal of Financial Counseling and Planning*, *25*(2), 148–160.

Lusardi, A., Mitchell, O. S., Curto, V. (2010). Financial literacy among the young. *Journal of Consumer Affairs*, *44*, 358–380. http://dx.doi.org/10.1111/j.1745-6606.2010.01173.x

Malm, E. (2005). Using transaction-specific incentives to increase online mortgage transactions. *Journal of Website Promotion*, *1*(1), 93–103. http://dx.doi.org/10.1300/J238v01n01_08

McCain, K. W. (1999). Mapping economics through the journal literature: An experiment in journal co-citation analysis. *Journal of the American Society for Information Science*, *42*(4), 290–296.

McCormick, M. H. (2009). The effectiveness of financial youth education. A review of the literature. *Journal of Financial Counseling and Planning*, *20*(1), 70–83.

Mimura, Y., Koonce, J., Plunkett, S. W., & Pleskus, L. (2015). Financial information source, knowledge, and practices of college students from diverse backgrounds. *Journal of Financial Counseling and Planning*, *26*(1), 63–78.

Moloo, R. K., Kissoon, M., Louise, P., & Cootthen, S. (2010, October). A lightweight mobile banking solution easily integrateable with existing banking system. In *Annual International Conference on Infocomm Technologies in Competitive Strategies* (pp. 42–49). Singapore, Singapore. http://dx.doi.org/10.5176/978-981-08-7240-3_I-40

Münster, E., Rüger, H., Ochsmann, E., Letzel, S., & Toschke, A. M. (2009). Over-indebtedness as a marker of socio-economic status and its association with obesity: A cross-sectional study. *BMC Public Health*, *9*(286), 1–6. http://dx.doi.org/10.1186/1471-2458-9-286

Ochsmann, E. B., Rueger, H., Letzel, S., Drexler, H., & Muenster, E. (2009). Over-indebtedness and its association with the prevalence of back pain. *BMC Public Health*, *9*(451), 1–8. http://dx.doi.org/10.1186/1471-2458-9-451

Palfrey, J., & Gasser, U. (2008). *Born digital: Understanding the first generation of digital natives*. New York, NY: Basic Books.

Persson, O. (2015). *Bibexcel*. Retrieved from https://bibliometrie.univie.ac.at/bibexcel/

Persson, O., Danell, R., & Schneider, J. W. (2009). How to use Bibexcel for various types of bibliometric analysis. In F. Åström, R. Danell, B. Larsen, & J. W. Schneider (Eds.), *Celebrating scholarly communication studies: A Festschrift for Olle Persson at his 60th birthday* (pp. 9–24). Leuven, Belgium: International Society for Scientometrics and Informetrics. Retrieved from http://www.issi-society.org/ollepersson60/

Polasik, M., Górka, J., Wilczewski, G., Kunkowski, J., Przenajkowska, K., & Tetkowska, N. (2012, June). Chronometric analysis of a payment process for cash, cards and mobile devices. In *Proceedings of the 14th International Conference on Enterprise Information Systems* (Vol. 2 ISAS, pp. 220–229). Wroclaw, Poland: Institute for Systems and Technologies of Information, Control and Communication.

Rahman, M. M., Rezaul, K. M., & Hossain, A. (2009, November). *Finding an effective and secured information system in E-commerce environment*. Paper presented at 2009 International Conference for Internet Technology and Secured Transactions, London, United Kingdom.

Raijas, A., Lehtinen, A. R., & Leskinen, J. (2010). Over-indebtedness in the Finnish consumer society. *Journal of Consumer Policy*, *33*(3), 209–223. http://dx.doi.org/10.1007/s10603-010-9131-8

Ramsay, I. (2012). A tale of two debtors: Responding to the shock of over-indebtedness in France and England—a story from the Trente Piteuses. *Modern Law Review*, *75*(2), 212–248. http://dx.doi.org/10.1111/j.1468-2230.2012.00897.x

Reifner, U., & Herwig, I. (2003). Consumer education and information rights in financial services. *Information & Communications Technology Law*, *12*(2), 126–142.

Robb, C. A., & Sharpe, D. L. (2009). Effect of personal financial knowledge on college students' credit card behavior. *Journal of Financial Counseling and Planning*, *20*(1), 25–43.

Rueger, H., Schneider, N. F., Zier, U., Letzel, S., & Muenster, E. (2011). Health risks of separated or divorced over-indebted fathers: Separation from children and financial distress. *Social Work in Health Care*, *50*(3), 242–256. http://dx.doi.org/10.1080/00981389.2010.527793

Rueger, H., Weishaar, H., Ochsmann, E. B., Letzel, S., & Muenster, E. (2013). Factors associated with self-assessed increase in tobacco consumption among over-indebted individuals in Germany: A cross-sectional study. *Substance Abuse: Treatment, Prevention, and Policy*, *8*(1), 12. http://dx.doi.org/10.1186/1747-597X-8-12

Schudelaro, I. R. A. A. P. (2003). To be or not to be electronic money, that's the question. *Information & Communications Technology Law*, *12*(1), 49–55.

Seybert, H., & Reinecke, P. (2013). *Internet use statistics—individuals. Three quarters of Europeans used the internet in 2013*. Retrieved from http://ec.europa.eu/eurostat/statistics-explained/index.php/Archive:Internet_use_statistics_-_individuals

Swedish Enforcement Authority. (2012). *Omvärldsanalys* [Analysis of current trends]. Gothenburg, Sweden: Author.

Swedish Enforcement Authority. (2013). *Skuldsättning av Unga genom E-handel på Kredit* [Young people's debts due to online shopping on credit]. Rapport: 2013-03-01. Gothenburg, Sweden: Author.

Thair, A. D., Luo, S., & Summons, P. (2010, May). Consumer acceptance of mobile payments: An empirical study. In *4th International Conference on New Trends in Information Science and Service Science* (pp. 533–537). Gyeongju, South Korea: Institute of Electrical and Electronics Engineers.

Tomášková, H., Mohelská, H., & Němcová, Z. (2011). Issues of financial literacy education. *Procedia—Social and Behavioral Sciences*, *28*, 365–369. http://dx.doi.org/10.1016/j.sbspro.2011.11.069

van Eck, N. J., & Waltman, L. (2010). Software survey: VOSviewer, a computer program for bibliometric mapping. *Scientometrics*, *84*(2), 523–538.

van Eck, N. J., & Waltman, L. (2011). Text mining and visualization using VOSviewer. *ISSI Newsletter*, *7*(3), 50–54. Retrieved from http://www.issi-society.org/archives/newsletter27.pdf

Venkataramani, G., & Gopalan, S. (2007, April). Mobile phone based RFID architecture for secure electronic payments using RFID credit cards. In *Proceedings of the Second International Conference on Availability, Reliability and Security, 2007* (pp. 610–617). Vienna, Austria: Institute of Electrical and Electronics Engineers. http://dx.doi.org/10.1109/ARES.2007.105

VOSviewer. (2015). *Welcome to VOSviewer*. Retrieved from http://www.vosviewer.com/Home

Walker, C. (2012). Personal debt, cognitive delinquency and techniques of governmentality: Neoliberal constructions of financial inadequacy in the UK. *Journal of Community and Applied Social Psychology*, *22*(6), 533–538. http://dx.doi.org/10.1002/casp.1127

Wang, Y., Li, S., & Lin, Z. (2013, July). Revealing key non-financial factors for online credit-scoring in e-financing. In *Proceedings of the 10th International Conference on Service Systems and Service Management* (pp. 547–552). Hong Kong, China: Institute of Electrical and Electronics Engineers. http://dx.doi.org/10.1109/ICSSSM.2013.6602651

World Internet Project. (2013). *World Internet Project international report* (5th ed.). Los Angeles, CA: University of Southern California.

Wopperer, W. (2002). Fraud risks in E-commerce transactions. *Geneva Papers on Risk and Insurance: Issues and Practice*, *27*(3), 383–394.

Xiao, J. J., & Wu, J. (2008). Completing debt management plans in credit counseling: An application of the theory of planned behavior. *Journal of Financial Counseling & Planning*, *19*(2), 29–45.

Xiao, J. J., Tang, C., Serido, J., & Shim, S. (2011). Antecedents and consequences of risky credit behavior among college students: Application and extension of the theory of planned behavior. *Journal of Public Policy and Marketing*, *30*(2), 239–245. http://dx.doi.org/10.1509/jppm.30.2.239

Zhou, T. (2012). Understanding users' initial trust in mobile banking: An elaboration likelihood perspective. *Computers in Human Behavior*, *28*(4), 1518–1525.