

# FinTech credit: Online lending platforms in Sweden and beyond

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New digital technologies in banking and finance, commonly referred to as ‘FinTech,’ have the potential to transform established banking business models. This article studies online lending platforms, which are new players in the financial sector that allow individuals or firms to obtain loans directly from investors via the internet. To date, online lending is still small relative to total bank lending. However, online lending has expanded rapidly not only in China, the US and the UK, but also in Sweden. In 2018 Swedish platforms originated more than SEK 2bn of new loans – exceeding the 2017 volume by 51 per cent. We discuss how online lending platforms differ from commercial banks and how they are regulated. Moreover, we analyse market developments, such as the growing linkages between platforms and the banking sector. Against this backdrop, we review potential financial stability implications that may appear if online lending continues to grow in importance.

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## 1 Introduction

Starting in the early 2000s, tech-driven companies developed digital financial technologies (FinTech) to enable online lending solutions as an alternative to bank-based credit intermediation.<sup>1</sup> The new FinTech players include online lending platforms such as LendingClub, the US market leader. More recently, e-commerce platforms such as Amazon in the US and Alibaba in China also began extending credit to suppliers and customers, leveraging on their vast digital platforms which provide them with very detailed information about prospective borrowers.

The focus of this article is on FinTech credit and, more specifically, on online lending platforms.<sup>2</sup> What are online lending platforms and how do online lending platforms differ from bank-based credit intermediation? What are the main trends regarding the evolution of online lending platform business models, the involvement of the traditional banking sector and financial regulation? Our objective is to address these questions with a view to their scope for financial stability implications.

FinTech credit has expanded rapidly, with the largest markets being in China, the United States and the United Kingdom. For some market segments FinTech credit has become an

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1 Other FinTech solutions not covered in this paper include digital payment system innovations such as mobile payment solutions and blockchain technology, as well as digital investment management solutions such as robo-advice.

2 In this article we use the term FinTech credit in a broad sense and adopt a definition introduced by the Bank for International Settlements (BIS) and the Financial Stability Board (FSB). According to this definition FinTech credit captures all credit facilitated by online lending platforms that are not operated by commercial banks (CGFS-FSB 2017; Claessens et al. 2018).

important source of alternative credit to households and to businesses. A leading example is the UK where more than one quarter of the total volume of new loans to small businesses is originated by online lending platforms. Also Swedish online lending platforms have experienced a strong growth in recent years, but they are not yet an important source of credit relative to commercial banks.

One of the key drivers of the expansion of online lending is the customer convenience benefits associated with the digital user experience, such as the 24/7 availability and the fast loan application process, which are particularly appealing for an internet-savvy younger generation.<sup>3</sup> Other factors include the lack of credit supply to underserved borrowers in certain segments of the uncollateralized consumer credit market or the small business loan market. In fact, these market segments have been targeted initially by online lending platforms. Another driver is the potential cost advantage of online lending platforms vis-à-vis commercial banks. This is because online lenders neither have to maintain an expensive branch network, nor a costly legacy mainframe computer system. Instead, online lenders rely completely on online platforms, call centres, automated credit risk assessment and cloud-based banking software.

In light of the recent growth in FinTech credit there has been heightened interest among the regulatory community and academic researchers, who are eager to study the new developments and to understand the implications for traditional banking and financial stability. To date, our assessment is that the Swedish FinTech credit market is still too small to pose significant risks for the broader financial system. This view is also reflected in the current regulatory discussion, which primarily focuses on consumer and investor protection aspects. However, financial stability risks may emerge, provided the FinTech credit market continues to grow in importance. To this end, the trend towards a growing exposure of commercial banks to FinTech credit and concerns regarding the viability of online lending platform business models merit attention.

Section 2 describes how online lending platforms operate and highlights the differences to bank-based financial intermediation. We also discuss the market segments targeted by online lenders and their business models. Moreover, we give a detailed account of the market developments in Sweden and beyond. Next, Section 3 addresses the regulatory landscape. We discuss how FinTech credit is captured by existing regulation and the different approaches taken in regulating new FinTech credit solutions. Thereafter, Section 4 considers the potential financial stability implications of the expansion in FinTech credit. We address aspects related to the viability of online lending platform business models and the trend towards reintermediation, that is, the offering of new financial services which make online lending platforms more similar to banks. We also discuss the exposure of the traditional banking sector to online lending platforms and the responses of banks to the changing environment. Finally, Section 5 contains our conclusions.

## 2 Online lending platforms

During the last decade FinTech credit has rapidly grown in size and scope. The first online lending platforms have targeted the market for uncollateralized consumer credit with a focus on borrower segments that are underserved by banks. Over time online lending platforms have expanded to other markets such as student loans, car loans, mortgage loans, small business loans, as well as corporate loans for small and medium sized enterprises (SMEs). Research on FinTech credit in the United States shows that online lending to the uncollateralized consumer credit market can often be a substitute for bank lending. At the same time, FinTech credit can also complement bank lending in the segment of underserved borrowers (Tang 2018). In fact, research on German data shows that online lending platforms

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<sup>3</sup> See special issue on banking in *The Economist* (2019).

target a riskier slice of the consumer credit market that is underserved by traditional banks, charging risk-adjusted interest rates that are comparable to bank loans (De Roure et al. 2016).

FinTech credit promises benefits to both investors and borrowers. These benefits from disintermediated credit via online lending platforms may arise if banks collect high intermediation rents or if online lending platforms have a more favourable cost structure (no costly branch network, automated credit scoring, no capital or liquidity requirements, etc.). This can give rise to a competitive edge especially in riskier borrower segments and for small loan sizes, where screening based on automated credit scoring technologies tends to be more profitable (Einav et al. 2013). The advantage of FinTech lenders in screening borrowers based on hard information may be related to the use of more sophisticated credit models (Fuster et al. 2018), or of new data sources (Berg et al. 2018).

The first P2P (peer-to-peer) online lending platform, Zopa, was established in the United Kingdom in 2005. P2P lending allows individual borrowers to be directly matched with investors, without the need of a financial institution to act as a middleman. Prosper, the first P2P online lending platform in the United States, followed in 2006. Both serve the uncollateralized consumer credit market segment. According to a recent survey by the Cambridge Centre for Alternative Finance more than three quarters of the global FinTech credit activity is now concentrated in China, which currently has more than one thousand active online lending platforms. Among the advanced economies the dominant FinTech credit markets are in the United States and the United Kingdom. The development of online lending in continental Europe has lagged behind, but the growth has been substantial in recent years.

Our paper provides the first study of the Swedish FinTech credit market. Based on the data we collected, the FinTech credit origination volume over the 2015–2018 period exceeded SEK 4.4bn. If we narrow down to uncollateralized consumer credit, we estimate that the loan origination volume of Swedish online lending platforms exceeded SEK 1.3bn in 2018. As a comparison, total outstanding credit card debt to households in Sweden stood at around SEK 49bn in 2018.<sup>4</sup> Hence, the size of the Swedish FinTech credit market volume was around 2.7 per cent when compared to the total outstanding credit card debt.

In Section 2.1 we describe schematically how online lending platforms differ from financial intermediation by commercial banks. Section 2.2 discusses business models of online lending platforms and zooms into the key aspects of financial intermediation. Thereafter, Section 2.3 offers a detailed account of the FinTech credit market development in Sweden and beyond.

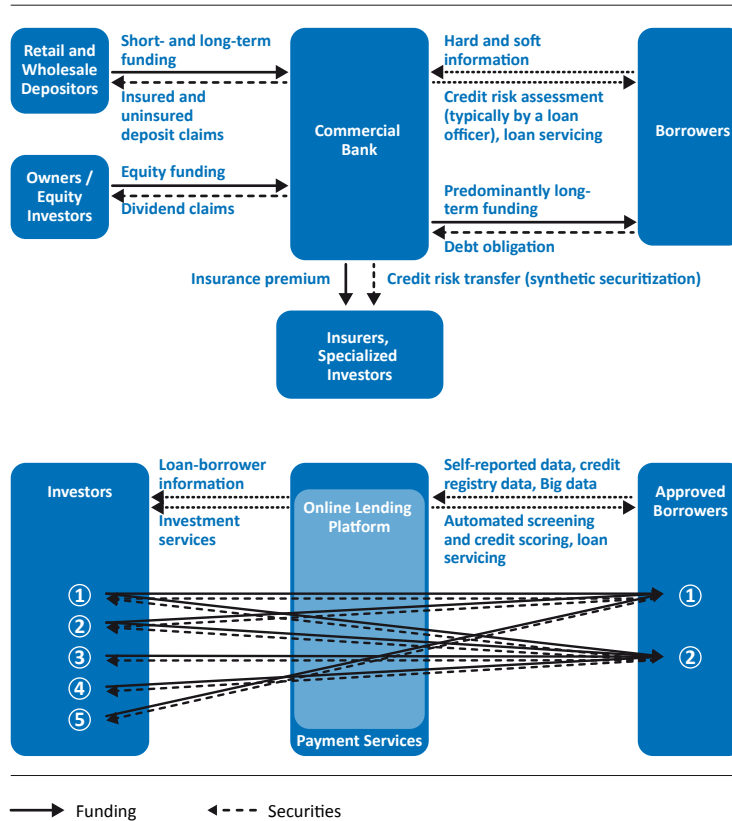
## 2.1 How online lending platforms compare to commercial banks

Traditional bank-based credit intermediation is characterized by commercial banks offering credit to households and firms, which is primarily funded by insured and uninsured deposits, as well as wholesale borrowing and equity. Conversely, the classical P2P crowdlending model disintermediates credit by allowing investors to directly invest in loans that are originated on the platform. That is, P2P online lending platforms cut the ‘middleman’ by offering a marketplace where credit supply and credit demand are directly matched. Figure 1 depicts a schematic comparison of bank-based credit intermediation and of disintermediated FinTech credit based on the classical P2P crowdlending model.

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<sup>4</sup> Based on data from Statistics Sweden Financial Market Statistics from December 2018.

**Figure 1. Schematic comparison: bank-based credit intermediation and the classical P2P crowdlending model**



Note. The graphic at the top depicts bank-based credit intermediation and the graphic at the bottom depicts disintermediated FinTech credit based on the classical P2P crowdlending model.

Bank-based financial intermediation involves functions in four categories:<sup>5</sup> (1) liquidity and payment services, (2) asset transformation, (3) credit, liquidity and interest rate risk management, and (4) credit risk analysis and monitoring of borrowers. Two of these functions are also performed by online lending platforms pursuing the classical P2P crowdlending model, namely asset transformation and credit risk analysis. First, platforms transform the denomination of assets by dividing the loan demand of an individual borrower into smaller notes (for example 25 US dollar denominations). These notes can be bought by multiple investors who can conveniently diversify across borrowers as depicted in Figure 1. Second, platforms perform an automated credit risk assessment and act as information providers. The loans are serviced by the platform. To facilitate the transfer of funds between the bank accounts of investors and borrowers, platforms may cooperate with clearing banks who provide payment services.

An important feature of the commercial bank model is that banks take credit risk on their balance sheet and produce safe deposit claims, using bank equity as a loss buffer. Moreover, banks engage in maturity transformation, meaning that there is a maturity mismatch with the average maturity of the credit to borrowers (asset side of the bank balance sheet) exceeding the maturity of the funding (liability side of the bank balance sheet). As a result, banks need to manage credit and liquidity risk. For typical commercial banks a substantial part of the funding comes from demandable deposits that are covered by deposit insurance, as well as from secured and unsecured short- and long-term wholesale debt. While banks may offload some of the credit risk to insurers and other specialized investors, part of the

5 See Freixas and Rochet (2008).

credit risk stays on the balance sheet. Conversely, the classical P2P crowdlending model transfers all the credit risk directly to investors by matching individual borrowers with a large number of investors who provide long-term risk capital.

The borrower categories targeted by online lending platforms typically allow using an automated credit risk assessment to screen borrowers. A prime example of this is the market for uncollateralized consumer credit, which was targeted initially by online lending platforms. For certain other market segments like corporate debt, platforms also rely on manual inspection by loan officers. In contrast to banks, online lending platforms do not have a branch network and are heavily dependent on digital technologies. This makes them suitable for lending activities where it is important to screen borrowers before extending the loan and where lending contracts can be highly standardized. Instead, online lending platforms are less suitable for lending activities where standardized contracts are problematic. An example is monitoring intensive lending activities that build on long-term relationships, which are at the core of commercial banking. Here banks closely follow the customer over the duration of the loan, and regularly use more sophisticated contracts that are tailored to the client and regularly include instruments such as loan covenants. In such lending activities commercial banks have a clear comparative advantage with their emphasis on bank-firm relationships, soft information and in-person interaction, which is facilitated by the vast bank branch network and the expertise of loan officers.

Another important difference between commercial banks and online lending platforms is that they operate in different regulatory environments (see discussion of regulatory aspects in Section 3). Lastly, commercial banks engage in money creation, which is not the case for online lending platforms. A detailed discussion of this aspect is beyond the scope of our article.<sup>6</sup>

## 2.2 Online lending platform business models

Online lending platforms rely heavily on digital financial technologies that have become available during the last two decades. Over time the technologies to match credit supply and demand have been refined substantially. The first P2P crowdlending platforms facilitated their lending decisions and the interest rate determination with the help of an auction mechanism to harness the ‘wisdom of the crowd’ of investors. With the availability of more credit data and better models for credit risk analysis, major online lending platforms abandoned auctions in favour of a faster and more convenient origination process, which is heavily data-driven and uses a model-based interest rate determination.

As said earlier, the market segment for uncollateralized consumer credit was the first to be served by online lending platforms. Early business models were tailored towards consumer debt consolidation. Moreover, online lending platforms targeted borrower groups that are underserved by traditional banks. This could, for instance, be the case because of usury laws or for other reasons that reduce the supply of bank credit to the riskier segments of the uncollateralized consumer credit market. The online lending platform’s promise for consumers is to refinance expensive revolving consumer debt with a cheaper term loan originated by the platform, or to help consumers to meet larger (potentially unexpected) expenses. Among the key advantages of P2P loans advertised by platforms are the speed of the loan approval and origination process, as well as the digital user experience and the transparent loan terms, including the possibility of an early loan repayment without penalty.

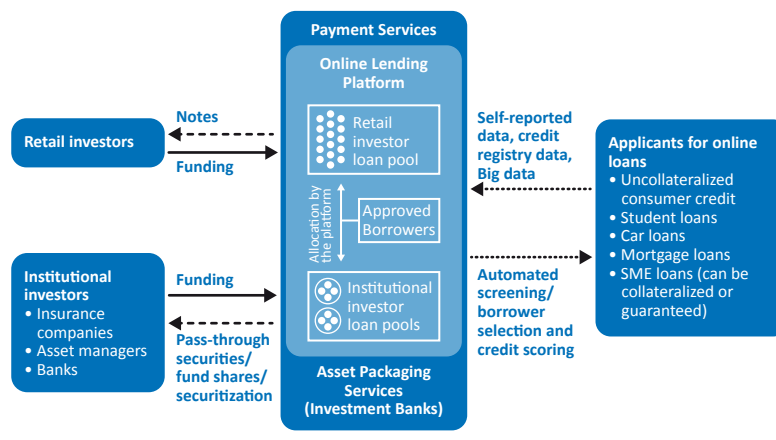
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<sup>6</sup> The fractional reserve banking system allows banks to create money by issuing loans and matching deposits in the account of the borrower. This money creation by banks is limited by prudential regulation, monetary policy and market forces. In contrast, online lending platforms do not create money, but solely match funds of borrowers and investors. It remains to be said that there are other forms of FinTech credit, which can involve money creation. An example is the e-commerce platform Alibaba, which runs the mobile payment platform Alipay. Besides offering payment services Alipay also extends consumer credit that is matched by mobile money deposits in Alipay accounts.

Figure 2 illustrates the transformation of the classical P2P crowdlending model. Starting from the lending side, online lending platforms have expanded to other uncollateralized credit market segments like student loans and small business loans, as well as to markets that are typically collateralized, such as car loans and mortgage loans. Some platforms are also active in the market for corporate loans to SMEs, where loans may be secured with real collateral or with personal guarantees. In these latter markets, online lending platforms are often in direct competition with banks and strive to offer a substitute for bank-based credit intermediation. The benefits for borrowers may have to do with the transparency or flexibility of the products offered and the more favourable cost structure of online lending platforms. Unlike commercial banks, online lending platforms do not have to sustain an expensive branch network. Customer interaction happens using digital internet-based technologies and call centres. The loan approval process has a high degree of automation. Platforms collect self-reported and publicly available information about loan applicants such as credit registry data. For some market segments, such as uncollateralized consumer credit, the credit risk analysis is fully automated with models for screening and credit scoring. In other segments like SME loans the platforms employ loan officers. Going forward, the credit risk analysis will rely increasingly on Big Data and machine learning.<sup>7</sup>

The investor side of online lending platforms has also evolved drastically since the first securitization of P2P loans in 2013. The left-hand side of Figure 2 gives a schematic overview of the investor side that accounts for the transformation of the classical P2P crowdlending business model.

**Figure 2. Transformation of the classical P2P crowdlending platform model towards a refined marketplace lending business model with retail and institutional investors**



Major online lending platforms like LendingClub and Prosper in the US and the online lender FundingCircle in the UK now operate platforms that are open to both retail and institutional investors. The platforms screen loan applicants and use a data-driven credit model to determine the interest rate for the fixed maturity loans. Approved borrowers are allocated either to a loan pool dedicated for retail investors (retail investor loan pool; fractional loan market) or to a loan pool dedicated for institutional investors (institutional investor loan pool; whole loan market).

The fractional loan market for retail investors typically operates in the same way as the classical P2P crowdlending model described earlier. Retail investors purchase notes which correspond to a fraction of individual loans, so called fractional loans. It is possible for retail investors to handpick fractional loans, but the use of automated investment tools is

<sup>7</sup> Big Data refers to the use of new data sources such as the 'digital footprint' of customers based on social media and internet usage data, which can then be automatically processed using algorithms and statistical models (machine learning).

dominant. Automated investment services offered by platforms allow investors to delegate the allocation of funds and to diversify investments on the platform across individual loans and rating categories according to the investors' risk preferences. The online lending platform provides information on loan-borrower characteristics and assigns a proprietary credit rating to guide investors. Moreover, online lending platforms publish performance statistics based on historic data for different rating categories. Typically, the fractional loan market is characterized by a full pass-through of the credit risk to retail investors. However, numerous platforms, especially in China, have experimented with (partial) insurance of credit risk offered by the platform's loss provision fund or by a third party insurer. After origination the loans are commonly repaid in monthly instalments. To allow retail investors to liquidate their investments prematurely, some platforms offer investors to return notes (potentially at a discount) or to sell them on a secondary market.

Since 2013 the institutional investor loan pool has grown in importance with insurance companies, asset managers and banks on the buyer side. Institutional investors purchase claims on loan pools serviced by the platforms. Similar to the retail investor market, there is also a trend towards for institutional investors towards passive investments, with investors delegating the loan screening to platforms (Bayluk and Davydenko 2019). There are three different funding models: pass-through securities, fund shares and securitization. The institutional investor market is characterized by a stronger link to the banking sector. Unlike retail investor funding, institutional investor funding often requires credit lines and asset packaging services from investment banks, who help to transform the underlying assets into securities and to access financial markets. Moreover, investment banks may also be involved in market making activities for P2P loan certificates that are traded over-the-counter, thereby providing liquidity services to institutional investors. In addition, there is a recent trend towards balance sheet lending in the institutional investor segment, which we can observe in the United States (CCAF 2018a) and in other jurisdictions, including Sweden. Under this model platforms do not fully pass through the credit risk, but take an equity share in institutional investor loan pools. This means that akin to banks, platforms start to have 'skin in the game' not only with their reputation but also with their balance sheet. One interpretation of the observed trend towards balance sheet lending is that online lending platforms want to tap new segments of the institutional investor market and address a potential moral hazard problem by giving assurance regarding the soundness of the underwriting standards and technology.

To conclude the discussion of business models, it remains to address the question: How do online lending platforms earn money? While commercial banks earn a large part of their income from credit activity with the spread of the lending rate over the borrowing rate, online lending platforms rely on fee income. The major part of the fee income of online lending platforms accrues at the point of loan issuance, when platforms collect an origination fee that is typically paid by borrowers. Additionally, many platforms also charge fees to investors for loan servicing and for automated investment services.<sup>8</sup> To date, most online lending platforms are loss making and invest heavily in expanding their businesses.<sup>9</sup>

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8 As an example, the fee structure at the largest online lending platform LendingClub consists of: 1) a one-time origination fee of 1–6 per cent on the borrower's rating category, which is higher for riskier borrowers; 2) an annual loan servicing fee of 1 per cent paid by lenders; 3) a late payment fee of 5 per cent of the unpaid instalment or a minimum of 15 US dollars; 4) a check payment fee of 7 US dollars for borrowers, which does not apply for online transfers; 5) a collection fee in the case of a delinquent borrower, which is paid by investors.

9 Table 4 of CGFS-FSB (2017) gives an overview of the profitability of leading UK and US online lending platforms.

## 2.3 Market development in Sweden and beyond

Online lending origination volumes have been growing rapidly during the last decade. In this section we first highlight the development of the three largest markets in China, the United States and the United Kingdom. Thereafter, we discuss the development of the Swedish online lending market.

**Table 1. The expansion of online lending**

	2017 P2P loan origination volumes in billions of USD	Annualized growth rate in the 2015–2017 period
China	327.8	49.8%
United Kingdom	6.0	53.2%
United States*	32.5	9.9%

Note. The data is based on survey data from CCAF (2018a,b,c) and the authors' computations. We use a subset of alternative finance, namely P2P consumer lending, P2P business lending and P2P property lending.

\*For the US we also include balance sheet lending to consumers, which grew in importance for P2P platforms that now adopt the refined marketplace lending business model depicted in Figure 2.

China has the by far biggest online lending market. In 2017 the annual P2P consumer lending, P2P business lending and P2P property lending origination volume of the Chinese online lending market stood at USD 327.8bn.<sup>10</sup> The P2P segment of the Chinese online lending market experienced an annualized growth rate exceeding 100 per cent till 2016 and then slowed down. For the UK we have a similar picture. The online lending market in the US started to slow down earlier and stronger after growing by 84 per cent per quarter between 2007 and 2014 according to a Federal Reserve Bank of Cleveland study by Demyanyk and Kolliner (2014). In comparison, the development of online lending in continental Europe has lagged behind with an annual P2P origination volume of EUR 1.1bn in 2016. Nevertheless, also the European market expanded rapidly with an annualized growth rate exceeding 50 per cent in many European countries.<sup>11</sup>

The first P2P lending platforms were established in the mid-2000s in the United Kingdom, the United States and China. The oldest platform is Zopa from the UK, which was established in 2005 and specializes in uncollateralized consumer credit. As of 2018, Zopa had an accumulated origination volume of close to GBP 4bn. Today, the largest UK online lending platform is FundingCircle with an accumulated origination volume of GBP 4.2bn in 2018, serving 42,000 businesses. FundingCircle was established in 2010 and specializes in SME business loans. Together with a group of smaller platforms, it accounted for 9.5 per cent of all new loans to SMEs (firms with a turnover below GBP 25m) in 2017 in the UK and for up to 29.2 per cent of all new loans to small businesses (turnover below GBP 2m).<sup>12</sup> A notable aspect of the UK market is that public banks such as the British Business Bank (BBB) and the European Investment Bank have promoted lending to SMEs to a significant extent also via online lending platforms.<sup>13</sup> In many cases business borrowers are referred to online lending platforms by banks. Moreover, the BBB also operates an alternative business-funding platform.

In the United States, the first online lending platforms are Prosper, established in 2006, and LendingClub, established in 2007. Today they are the dominant US online lending platforms in the market for uncollateralized consumer credit. As of December 2018, the

<sup>10</sup> Estimates are based on Cambridge Centre for Alternative Finance survey data (CCAF 2018b).

<sup>11</sup> See CCAF (2018d) for a detailed report from the Cambridge Centre for Alternative Finance survey for Europe.

<sup>12</sup> See CCAF (2018c). Estimates are based on Cambridge Centre for Alternative Finance and UK Finance data.

<sup>13</sup> For example the British Business Bank has lent GBP 165m to conforming SMEs over the period from March 2013 till November 2018 on the FundingCircle platform and, additionally, committed up to GBP 150m of senior finance to its SME fund in November 2018.



total accumulated origination volumes exceeds USD 42bn for LendingClub and USD 14bn for Prosper. Another large US online lending platform is SoFi, established in 2011. It has a total accumulated origination volume exceeding USD 30bn and specializes in student loans and mortgages. SoFi was pioneering the expansion of the investor base by conducting in 2013 the first securitization of P2P student loans, which received a credit rating.<sup>14</sup> During the last years the aforementioned balance sheet lending model grew in importance. Today many US online lending platforms operate a marketplace lending business model alongside a balance sheet lending model. In fact marketplace/P2P consumer lending fell from USD 21.1bn in 2016 to USD 14.7bn in 2017, while balance sheet consumer lending grew from USD 2.9bn in 2016 to USD 15.2bn in 2017.<sup>15</sup> To date, online lending platforms are still small in relative terms. In 2016 the volume of marketplace/P2P consumer lending (USD 21.1bn) was just 2.17 per cent when compared to the size of the outstanding revolving consumer credit (USD 969.4bn).<sup>16</sup> In certain market niches it gained, however, significance. By 2018 online lending reached one-third of the US market for unsecured personal loans (Balyuk and Davydenko 2019).

The by far largest online lending market is China. The first Chinese P2P crowdlending platforms were established in 2007. By 2016 the number of active online lending platforms grew to more than 3,000. In 2017 and 2018 a market consolidation wave has reduced the number of active platforms. Relative to the US and Europe, the Chinese market is much more dispersed. Most platforms tend to be smaller in size and the largest Chinese platform is LUp2p with a total volume of outstanding loans exceeding USD 21bn in December 2018 according to data from Home of Online Lending. Also the size of FinTech credit relative to uncollateralized consumer loans from traditional banks in China is thought to be very high in an international comparison, reaching up to 20 per cent in 2016.<sup>17</sup> One explanation for the big size of the Chinese online lending market is the limited availability of bank-based consumer credit, but also the active promotion of the FinTech credit market development by government authorities.

In Sweden the total origination volume by online lending platforms for the 2015–2018 period exceeded SEK 4.4bn with the platforms Lendify and Tessin (both established in 2014) being the dominant players. Figure 3 shows the evolution of the origination volumes in the Swedish P2P online lending market. Similar to the UK, the Swedish online lending market started to develop earlier than other continental European markets. However, the Swedish market experienced a major setback after the closure of the dominant platform Trustbuddy, which filed for bankruptcy in October 2015 after a scandal. This explains the sharp drop in loan origination volumes in the second half of 2015. Subsequently, the market took more than two years to recover, with younger platforms gradually filling the large gap left by the market leader Trustbuddy. We discuss the Trustbuddy scandal in Box 1 in the Appendix.

It appears that the Trustbuddy scandal slowed down the expansion of online lending platforms in Sweden. However, there does not seem to be a lasting negative effect on the growth prospects of competing platforms. According to our survey and estimates, the Swedish online lending market has grown at an annualized rate of around 190 per cent in 2017. Thereafter, the annualized growth rate has slowed down to around 51 per cent in 2018. To date, the size of the Swedish online lending market is still small relative to total bank lending. However, the high growth rates, as well as the market developments in other advanced economies like the US and UK suggest that in a few years online lending may also become an important source of credit in certain market segments in Sweden. Namely, the riskier uncollateralized consumer credit segment or the Swedish mortgage market, where a

14 See Bloomberg article by Campbell (2019).

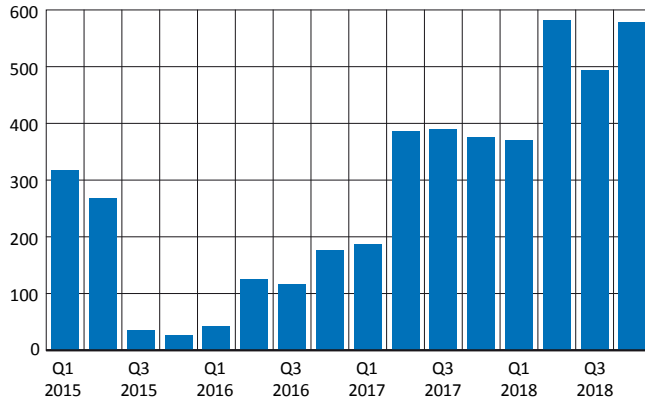
15 See CCAF (2018a) for a detailed report from the Cambridge Centre for Alternative Finance survey for the United States.

16 Based on data from the Federal Reserve Board of Governance and CCAF (2018a)

17 See Braggion, Manconi and Zhu (2018).

number of alternative non-bank credit providers have emerged recently alongside the online lending platforms.<sup>18, 19</sup>

**Figure 3. Evolution of the loan origination volumes of the largest Swedish P2P online lending platforms over the period 2015–2018**  
Million SEK



Note. We identify and survey the eight largest platforms, which are listed in Figure 4. Notably, we restrict attention to platforms that started off with the classical P2P crowdfunding model and continue to have retail investors. Moreover, we exclude other non-bank consumer credit institutions that specialize in online lending solutions, but exclusively focus on institutional investors (e.g. alternative investment funds) and balance sheet lending. Finally, we include Trustbuddy which closed and filed for bankruptcy in October 2015. Sources: Riksbank survey and estimates based on authors' calculations

Figure 4 depicts the most popular Swedish P2P online lending platforms by market segment. The largest market segments is uncollateralized consumer loans, followed by collateralized real estate loans. The platform Trine plays a special role in that it originates credit to renewable energy projects outside Sweden.<sup>20</sup> Unlike in the UK, SME loans constitute a comparably small market segment in Sweden. Except for Kameo, all platforms are, or have been, registered as a payment institution or as a 'finansieellt institut' with the Swedish Financial Supervisory Authority. Kameo is registered with the Danish Financial Supervisory Authority and operates a Swedish branch.

**Figure 4. The largest players in the Swedish P2P online lending space**



Note. As before, we restrict attention to platforms that started off with the classical P2P crowdfunding model and continue to have retail investors. The platform Trustbuddy was closed in October 2015.

18 See Sveriges Riksbank Financial Stability Report 2018:1 (2018).

19 These other alternative credit providers do not directly match borrowers and investors, but exclusively rely on balance sheet lending and are targeted to institutional investors.

20 Investors in Trine loans receive a partial protection against losses from the Swedish development agency SIDA.

To date, our knowledge of the market niches targeted by online lending platforms is only limited. A better understanding would require analysing detailed information about the types of borrowers and investors. On the largest Swedish platform Lendify, interest rates range between 2.95 per cent and 17 per cent. Including the servicing fee, the average effective rate charged to borrowers is likely to exceed 10 per cent. On the investor side, Lendify advertises an average return after service fees and expected losses of around 4.8 per cent for retail investors in ‘autoinvest long’ and of around 3.4 per cent for ‘autoinvest short’ (as of the first quarter in 2019).

Interestingly, there is evidence that online lending platforms and banks compete directly for customers in the consumer loan segment. An example is again the largest platform Lendify, which is listed on the site of the online broker Lendo alongside a number of mid-sized and larger Swedish banks. Moreover, there are also direct and indirect links between the Swedish banking sector and online lending platforms in the form of ownerships or partnerships, as well as via the provision of asset packaging services. An example of a direct ownership link is the platform Toborrow, which is owned by Marginalen Bank.

In recent years funding from institutional investors has gained importance also in Sweden and many platforms starting to cater to both institutional and retail investors, as described in Figure 2. Notably, some platforms engage in balance sheet lending by retaining an equity stake in their funding vehicles, meaning that the platform assumes the first losses. Under this model platforms obtain funds from institutional investors by creating alternative investment funds or by issuing bonds, which are secured by loans originated on the platform. Typically secured bonds promise a fixed return and can be traded on the Nordic Derivatives Exchange NDX. When loans are repaid, the platform repurchases the bonds in the market. Notably, it is common that the credit risk is only partially transferred to investors since the platforms retain an equity stake in the funding vehicle. Besides the trend towards a dominance of institutional investors and balance sheet lending, some Swedish platforms also follow the reintermediation trend by offering loss provision funds or by offering secondary markets.

Having discussed the market development, we next turn to the drivers behind the growth of FinTech credit and expand on the discussion provided in the introduction. We can distinguish between demand and supply side factors (see, for example FSB (2017)). On the demand side, customers value the digital user experience that comes with convenience benefits such as a 24/7 availability and speedy processes. The general trend towards an increasing share of digital transactions (for example in e-commerce) constitutes a shift in consumption habits that also benefits online lending platforms which specialize in digital-only services. Besides, a dissatisfaction with services from traditional banks can also be a relevant determinant of the expansion of online lending, especially when the banking sector lacks competitiveness, or when trust in traditional banks is impaired, for example due to bank misconduct.<sup>21</sup> On the supply side, technological developments and internet penetration are key. Most importantly, technological advances reduce the cost of entry for new financial service providers and allow them to scale up rapidly with the help of cloud-based bank services. Also the operating costs of new entrants are often lower than the operating costs of incumbent banks which maintain a vast branch network and rely on legacy mainframe computer systems. Another potential supply-side factor is search for yield by investors. More specifically, the low interest rate environment may attract retail and institutional investors to consider alternative investments that promise attractive return, thereby, fuelling the expansion of FinTech credit.

Financial regulation also plays an important role.<sup>22</sup> New financial service providers benefit in many jurisdictions from a lower regulatory burden when compared to commercial banks.

21 See Bertsch et al. (2018) on how shocks to bank misconduct complaints (for example complaints about unfair contractual terms, opaque or unpredictable fees, or deliberate misselling) drive borrowers to online lending platforms in the United States.

22 See Rau (2018) for a cross-country study documenting the important role played by the quality of regulation and the rule of law.

In parts, this is because existing regulatory frameworks have a strong focus on bank-based financial intermediation, meaning that FinTech credit business models are not or only partially captured by existing regulation. However, authorities also seek to avoid a situation where regulation stands in the way of experimenting with potentially beneficial FinTech innovations. We will discuss the regulatory landscape in more detail in the next section.

### 3 Regulatory landscape and lessons from failures of online lending platforms

Financial innovations have the potential to offer substantial benefits and can improve the functioning of the financial system. However, new financial technologies can also pose new risks and challenges spanning from consumer and investor protection to financial stability considerations. Financial regulators strive to identify and manage new risks as they emerge. In the context of FinTech credit, managing new risks may require that the existing financial regulation has to adjust and find new ways to safeguard lenders and borrowers, as well as the stability of the financial system.

Thereby, regulators may face a delicate balancing act. The objective of minimizing financial stability risks can in some cases be in conflict with the desire to allow for a regulatory landscape that enables innovation and experimentation with new business models by new FinTech start-ups, as well as by incumbent financial institutions. As long as the FinTech credit market is small, regulators' main concern is that the new players adhere to appropriate consumer and investor protection standards. Currently, these aspects take centre stage in the regulatory discussion. Going forward, a continuation of the rapid growth of FinTech credit will, however, increase the relevance of financial stability considerations, which are often discussed in the context of the broader debate on non-bank financial intermediation, or shadow banking.

We first describe in Section 3.1 the regulatory landscape from an international perspective. Thereafter, Section 3.2 considers the Swedish case against the backdrop of the ongoing regulatory discussion on the European Union level. Finally, Section 3.3 discusses lessons learnt from scandals and failures of online lending platforms.

#### 3.1 International perspective

Online lending platforms are outside the perimeter of regulated credit institutions. As a result, investments in online lending platforms are not covered by public deposit insurance schemes. In some jurisdictions, like Germany or the United States, only banks are allowed to extend credit. Here, online lending platforms have to rely on partner banks, typically small specialized credit institutions, who provide so called fronting services. Importantly, these partner banks administer payments and do not take on credit risk. In other jurisdictions online lending platforms can obtain a permit to broker credit based on recent regulation for crowdfunding institutions or based on existing regulation for payment institutions and for non-bank investment intermediaries.

To date, the largest online lending market is China. The Chinese market is relatively opaque and platforms have largely operated in a grey area. In late 2017, Chinese online lending platforms were asked to register with local authorities. This is part of an ongoing initiative to enforce the Interim Measures on Administration of Business Activities of Online Information Intermediaries introduced in August 2016, which stipulate the registration of platforms and the safeguarding of investor and borrower funds in custody accounts with commercial banks.<sup>23</sup> The pooling of funds via the balance sheet of online lending platforms has been prohibited so that investors have to be directly matched with borrowers. Additional

<sup>23</sup> See Financial Times article by Suya (2019), as well as TechCrunch article by Liu (2018).

new measures are designed to increase transparency about platform ownership and investments, as well as to reduce the risk that platform owners abscond investor funds. In mid-2018, government authorities intensified the clampdown after widespread misconduct and a large number of defaulting platforms, which we will come back to in Section 3.3.

Online lending platforms have also operated in a grey area in many other countries. Often with limited or no reporting requirements. In recent years, many jurisdictions have, however, started to introduce dedicated regulation for crowdfunding institutions (see Havrylchuk (2018) for a recent review paper). There is, however, a substantial variation in regulatory frameworks, which is for instance reflected in the allocation of supervisory responsibility. In some jurisdictions the supervisory authority is located with the banking supervisor, but often other government agencies are responsible.

The focus of the current regulatory debate is mostly centred around consumer and investor protection with an emphasis on disclosure requirements. In an international comparison the disclosure requirements and the voluntary disclosure of information by online lending platforms are highest in the United States and in the United Kingdom. This includes the publication of detailed loan level origination data and of performance data. In other jurisdictions disclosure requirements tend to be more limited. Differences in regulation and in voluntary information disclosure give rise to considerable variation in the quality of information provided to investors. An example are difference in the disclosure of borrower characteristics when comparing the largest US online lending platform for uncollateralized consumer credit, LendingClub, to Auxmoney, the largest continental European platform in the same market segment. In contrast to LendingClub, Auxmoney does not supply investors with verified information on a number of important borrower characteristics, such as employment status, income or debt-to-income ratio. Another example is the publication of stress test results that inform investors about the expected loan portfolio performance in different macroeconomic scenarios. This type of disclosure has been pioneered by US and UK platforms, but it is largely absent in continental Europe.

In many jurisdictions existing regulation only captures some aspects of FinTech credit business models and it is, for instance, unclear whether platforms are allowed to offer automated investment services, to access institutional investors or to create loss provision funds. In some cases this can lead to a situation where a lack of clarity creates regulatory uncertainty, which can hamper the development of the FinTech industry. Such uncertainty can be addressed by modifying the existing regulatory regime in order to better capture the FinTech credit business, or by following a regulatory sandbox approach.

The UK Financial Conduct Authority (FCA) was first to implement a regulatory sandbox approach, which gained international attention. Thereby, the FCA provides a temporary licencing regime, which removes regulatory uncertainty and allows new business ideas and products to be tested for six months in a controlled environment and at a smaller scale. Importantly, the regulatory sandbox licencing ensures oversight by the FCA and allows for a collaborative approach in determining best practises and product design safeguards for consumer and investor protection going forward. A recent initiative by the Global Financial Innovation Network (GFIN), a group of 12 financial regulators that includes the FCA and the US Bureau of Consumer Financial Protection, seeks to create a 'global sandbox' that enables cross-border testing of new financial products following an FCA proposal.

Some other countries have chosen to address the regulatory uncertainty with the help of so-called innovation hubs or help desks that offer assistance to FinTech start-ups, as well as banks that want to introduce new FinTech products to the market. In this way regulators help FinTech players to navigate the existing regulation and create space for the experimentation with new business ideas.

### 3.2 Regulation in Sweden and in the European Union

In Sweden the Financial Supervisory Authority Finansinspektionen (FI) opened an Innovation Centre for FinTech firms in 2018. The aim is to support the development of the sector by providing a platform for dialogue, which can, for instance, assist market participants who seek clarification regarding the applicability of existing regulation and its interpretation. Moreover, FI's newly created Innovation Centre can facilitate the authorisation of new FinTech solutions, as well as the registration process.

Swedish online lending platforms are registered with FI as a payment institution ('betalningsinstitut') or as a financial institutions ('finansiellt institut'). Most platforms are payment institutions, which covers a broader range of activities. The payment institution license gives permission to broker credits and to execute payments. It also covers the provision of delegated investment services for debt products. Relative to credit institutions with a banking license, the regulatory burden for payment institutions is considerably lower and online lending platforms face comparably few reporting and disclosure requirements. Anti-money laundry regulation is applicable to both payment institutions and financial institutions. A key difference between the payment institute and financial institute registrations is that the latter only allows for direct matching of borrowers and investors. Regarding the protection of borrowers, the rules of the Consumer Credit Act (2010:1846) apply, which regulates aspects such as the information that has to be provided to loan applicants or to borrowers, rules for interest rate adjustments by the lender and guidelines for lenders to ensure that borrowers have the financial capacity to service the loan. For alternative mortgage credit additional rules from the Mortgage Business Act (2016:1024) apply, which regulates aspects such as the right of borrowers for early repayments and the right to keep the mortgage till maturity.

Consumer protection is high on the agenda of the Swedish Financial Supervisory Authority (Finansinspektionen 2018). One key concern is to protect vulnerable borrowers from over-indebtedness. This concern is also reflected in a recent Swedish government inquiry on crowdfunding (SOU 2018). Regarding the protection of investors, an important aspect is to assure that investors in alternative investment products can understand the risks involved. To this end, the government inquiry suggest improvements in investor protection and disclosure requirements.

Going forward, the trend of Swedish online lending platforms to access institutional investors with the help of balance sheet lending (i.e. to provide equity as a first loss buffer), as well as the increasing interest of Swedish banks in owning online lending platforms suggests that regulatory clarity will be an important component in the development of FinTech credit activities. An example is the recent recommendation of the Swedish financial supervisory authority on alternative mortgage credit brokered by online lending platforms and other alternative non-bank credit providers (Finansinspektionen 2019). FI is of the view that investors in mortgages should be (authorized) professional investors. This is to assure that investors understand the risks involved and have the ability to provide long-term funding. In addition, FI provides a set of guidelines for adequate management of liquidity risks.<sup>24</sup> Moreover, FI also addresses the exposure of banks to the alternative mortgage credit market by mandating that so called *peribank structures*, i.e. mortgage structures such as alternative investment funds outside the banking group that are directly or indirectly owned by the parent bank, have to be taken into account in the existing frameworks for bank capital and liquidity regulation.

The future regulatory landscape for the Swedish FinTech credit space is expected to be influenced by initiatives on the European level. To date, there is no European legal and regulatory framework for FinTech credit. In March 2018 the European Commission put

<sup>24</sup> This includes contingency planning for alternative investment funds and funding maturities of at least ten years.

forward a proposal for the regulation of European crowdfunding platforms that provide funding for businesses.<sup>25</sup> The proposal is an initiative in the context of the European Capital Markets Union and refers to recent FinTech developments and the legal, as well as the regulatory fragmentation of the European market.

The European Commission proposal advocates a single set of rules and a single European Union-wide authorisation of crowdfunding platforms that provide funding for businesses. An important objective is to enable cross-border scaling of crowdfunding platforms and cross-border investing. The regulatory discussion in European policy circles includes questions regarding the registration, the supervision, the rules for governance and operations, as well as the rules for disclosure and financial conduct. It is noteworthy that crowdfunding platforms shall be banned to invest in projects or loans on the platform. Finally, an important decision to be taken concerns the allocation of regulatory and supervisory powers at the European or the national level.

Notably, the focus of the European Commission proposal is on investment-based and lending-based crowdfunding for businesses. This means that FinTech credit to consumers, the most important FinTech credit market segment in Sweden and internationally, is not covered. Nevertheless, it can be expected that a harmonization of the European legal and regulatory framework for crowdfunding platforms that provide funding for businesses would also have implications for the future regulation of FinTech credit to consumers on the national and European level.

### 3.3 Scandals and failures of online lending platforms

We conclude this section with a study of major scandals and failures of online lending platforms, which offer lessons on what can go wrong. Our discussion sheds light on issues concerning the transparency of the underwriting standards, as well as on the problematic practise of offering guaranteed returns. Besides the threat of fraud and uncertainty regarding the viability of online platforms, it turns out that the lack of dedicated resolution frameworks is a big risk for retail and institutional investors alike.

In Box 1 in the Appendix we describe the Trustbuddy bankruptcy in Sweden, which was an instance of outright fraud. The platform offered guaranteed returns to investors, a business model that has also been adopted by many Chinese platforms. For Trustbuddy, promising high returns to investors in the double-digits proved to be problematic from the start and opened the door to fraudulent business practises going forward. Due to the limited size of the platform and the small retail investor base, the platform's bankruptcy was a small event without any repercussions in the broader financial system. However, the scandal was an early demonstration of the new facets of financial fraud enabled by digital financial services, highlighting the importance of regulatory oversight for the growing FinTech credit market, including standards for reporting, investor protection and transparency.

Box 2 describes the market consolidation in China, which involved a drastic wave of platform closures. Due to numerous cases of fraud and failures of platforms, the Chinese online lending market has received increased regulatory scrutiny, especially after a second market turmoil erupted in summer 2018. Since 2016, more than 2,000 online platforms have been closed. This led to a significant loss of confidence by investors, who also suffered from the lack of dedicated resolution frameworks to wind down collapsed platforms and to facilitate the continued servicing of loans. The implications were major disruptions, strategic borrower defaults and low recovery rates of investors. Given the relatively large size of the Chinese online lending sector, the market turmoil had a significant effect on credit availability to some sectors like SMEs. A lesson for financial regulators is that existing regulations for contingency planning may have to be adjusted to account for the particularities of online

<sup>25</sup> See European Commission (2018a) for the proposal and European Commission (2018b) for the impact assessment.

lending platforms. In addition, minimum capital requirements may be a useful tool that can help to assure business continuity in adverse market scenarios. As said earlier, the Chinese government authorities intensified the clampdown on online lending platforms, prohibiting the pooling of funds by online lending platforms. In addition, new measures shall increase transparency and reduce the risk that platform owners abscond investor funds.

Finally, Box 3 in the Appendix describes the LendingClub scandal of May 2016, which involved the largest US online lending platform. The platform wrongly disclosed the allocation of loans in its funds and was not transparent about its own loan purchases, as well as its loan-pricing model. The lesson learnt is that funding from institutional investors is flighty, akin to wholesale funding of commercial banks. The trust in the underwriting standards of a platform can evaporate quickly and there is a risk of reputational spillovers to the wider FinTech credit sector. From a regulatory viewpoint, these observations matter provided the FinTech credit sector continues to gain in relevance. The LendingClub experience suggests that measures aimed at increasing transparency can also reduce the fragility of online lending platforms.

## 4 Financial stability implications

Financial innovations have the potential to offer substantial benefits and can improve the functioning of the financial system. However, new financial technologies can also pose new risks and challenges spanning from consumer and investor protection to financial stability considerations. When looking at the history of financial innovation, credit cards and mortgage-backed securities are two cases in point. The introduction of credit cards and their large-scale adoption in the 1980s and thereafter brought about clear benefits for consumers and merchants in terms of convenience, credit availability and security. However, the introduction of credit cards in the US also coincided with the explosion of US consumer debt and an increasing number of households becoming vulnerable to financial shocks and to increasing borrowing costs (see, for example Livshits et al. (2016)). Similarly, mortgage-backed securities have clear benefits for issuers (lower funding costs, increased liquidity) and for investors (safer assets, diversification benefits). But the financial innovation and its adoption by banks gave rise to substantial financial stability risks, as witnessed during the Great Financial Crisis where subprime mortgage-backed securities played a key role (see, for example Gorton and Metrick (2010)).

In this section we discuss how financial stability risks associated with FinTech credit innovations may appear and attempt to identify potential sources of risks with a focus on trends towards a reintermediation of FinTech credit, as well as on the growing exposure of commercial banks to alternative non-bank credit providers such as online lending platforms. A recent report by the Committee on the Global Financial System and the Financial Stability Board (CGFS-FSB 2017) provides one of the first discussions of the potential financial stability implications of FinTech credit. On the benefit side, FinTech credit promises efficiency gains from digital technologies, lean operations without costly legacy systems and less complexity relative to commercial banks. These factors can improve financial stability. In addition, disintermediation of credit and the matching of long-term investors with borrowers can lead to a reduction of structural liquidity risks vis-à-vis bank-based intermediation. Moreover, if online lending platforms fully transfer credit risk to investors with a high loss bearing capacity, the disintermediation of lending is likely to compare favourably with the cyclicity of lending by capital-constrained banks, resulting in a more steady credit supply. More broadly, financial stability benefits may arise from the diversification of the credit market landscape, as well as from a higher degree of competition and from the contestability of business models.



On the cost side, relevant concerns relate to the untested online lending platform business models and whether they can withstand a deep recession. This is because FinTech credit is a relatively recent financial innovation, implying that fragilities of platform business models and the soundness of algorithmic underwriting technologies warrant some caution. Potential problems are magnified by operational weaknesses and insufficient disclosure paired with potential conflicts of interest, as well as a lack of dedicated resolution frameworks and limited regulatory oversight.

Depending on the level of direct and indirect exposures of the traditional banking to the online lending sector, a key financial stability risk is the potential spill over of losses originating in the online lending sector to the broader financial system. The increased competition may also be a threat for traditional banking, with potential implications for the profitability and stability of banks. To this end, the banks' responses to competitive pressures and the growing linkages between online lending platforms and the banking sector are also a potential concern, especially in the context of the debate on shadow banking and non-bank financial intermediation in a broader sense.

We first turn in Section 4.1 to the growing exposure of the financial sector to FinTech credit, which suggests to be the most important avenue for a potential build-up in financial stability risks. We also connect to the broader debate on regulatory arbitrage, focusing on two aspects. First, banks may shift capital-intensive activities to online lending platforms and, second, online lending platforms may continue to gradually adopt services which are at the core of bank-based financial intermediation. Finally, Section 4.2 discusses in more detail sources of risks that stem from untested business models of online lending platforms, as well as magnifying factors.

#### 4.1 Growing exposure of the financial sector to FinTech credit

Our focus is on the exposure of banks to the FinTech credit sector. However, we acknowledge that the exposure of non-bank institutional investors could also be a concern, for instance, if institutional investors have a limited loss-bearing capacity or if there is a strong search-for-yield motive paired with a lack of investment experience in the new FinTech credit market segments.<sup>26</sup> The discussion of financial stability risks is closely related to the broader debate on non-bank financial intermediation outside the perimeter of prudential regulation.

Relevant exposures of the banking sector can be direct or indirect. A direct exposure of the commercial banks to online lending platforms can arise through ownerships and partnerships or through purchases of shares in institutional investor loan pools that are originated on platforms. In addition, commercial banks also assist online lending platforms with asset packaging services (see Section 2.2), which can expose banks to credit and liquidity risk in case of disruptions. More concretely, the failure of an online lending platform that is owned by a commercial bank can lead to the transmission of losses and cause reputational risks for bank. In fact, it may be the case that a bank is willing to pay off investors and take loans originated by the failed platform on the bank balance sheet in order to mitigate reputational risks. If online lending platforms continue to grow in size, such exposures may become relevant for financial stability.

An example of a partnership between a large platform and bank is the referral arrangement between FundingCircle and Santander UK.<sup>27</sup> Regarding ownerships, there are several online lending platforms owned by European banks. In Belgium, the second largest bank KBC Group owns the platform BoleroCrowdfunding.be, which originates loans to small businesses. A Swedish example of a direct ownership link is Toborrow, which is owned by Marginalen Bank, a smaller Swedish bank.

<sup>26</sup> Financial actors such as insurance companies and asset managers build up exposures to online lending platforms by investing in institutional investor loan pools.

<sup>27</sup> See Funding Circle (2014).

Besides the direct exposures of the banking sector, there are also relevant indirect exposures. These include the competition channel and the confidence channel. Regarding the competition channel there is an extensive academic debate in the banking literature discussing the complex relationship between competition and financial stability. When applied to the FinTech credit setting, this literature suggests that the increase of competitive pressures due to the emergence of online lending platforms may affect the stability of incumbent banks. The increase in competitive pressures is likely to be particularly concentrated for lending activities based on hard information. Notably, larger banks tend to have a stronger focus on transactional lending based on hard information, while smaller banks tend to give more discretion to loan officers who also rely on soft information (Berger et al. 2005). An example of hard, or easily quantifiable, information is credit registry data. Instead, soft information, such as information regarding the soundness of a borrower's investment plans, is typically harder to quantify.

Regarding financial stability, the direction of the competition channel depends on factors such as the market structure, the relevance of different agency frictions and the effectiveness of banking supervision. In our context, one implication could be that negative financial stability effects arise due to a reduction in bank profits or due to adverse incentive effects on banks' risk-taking.<sup>28</sup> It is, however, questionable whether a lower probability to withstand adverse shocks due to lower bank profits is a relevant concern for the case of Sweden, where the bank profitability is relatively high and a large part of bank profits is paid out to shareholders (see article on 'New players in the mortgage market' in Sveriges Riksbank Financial Stability Report 2018:1 (2018)).

Regarding the confidence channel, consider a major disruption in the FinTech credit sector, for instance due to lax underwriting standards. Such a disruption may cause institutional investors to reassess not only the risks associated with online lending platforms, but also the risks of commercial banks who operate in the same market segments or are suspected to use similar lending practises or technologies. As a consequence, the failure of online lending platforms can be a wake-up call for investors, leading to a loss of confidence that may negatively affect the banking sector even absent direct exposures.<sup>29</sup>

A different set of concerns relates to regulatory arbitrage. More specifically, direct investments by banks in online lending platforms and the passing on of selected bank clients to platforms can raise red flags if regulatory arbitrage motives are at play. Such a situation arises if commercial banks pass on capital extensive lending activities without fully eliminating the banks' exposure to these loans. To give an example, commercial banks may operate or partner with online lending platforms and systematically refer borrowers with certain characteristics. Under the balance sheet lending model, online lending platforms hold an equity stake in the loan pools and in funds for institutional investors. This equity stake may, however, be lower than the equity needed for bank-based financial intermediation. As a result, banks owning online lending platforms may engage in regulatory arbitrage and reduce the total cost of capital by shifting credit activity outside the regulatory perimeter. The relevance of this concern is, for instance, reflected in the recent recommendation of the Financial Supervisory Authority (Finansinspektionen 2019). As discussed in Section 3.2, Finansinspektionen advocates to include so called peribank structures, which started to emerge in the Swedish alternative mortgage credit market, into the existing frameworks for bank capital and liquidity regulation.

28 Keeley (1990) found a positive empirical relationship between more competition and more risk-taking by banks. Later studies came, however, to mixed or even opposite results. From a theoretical viewpoint the relationship is also not clear-cut and it depends on whether the relevant risk-shifting problem is on the part of the banks (Wagner 2010) or on the part of its borrowers (Boyd and De Nicoló 2005). A non-linear relationship is possible with more competition being stability enhancing in an environment with low or intermediate levels of competition, while excessive competition undermines financial stability (Martinez-Miera and Repullo 2010; Jiménez et al. 2013). See, for example, Vives (2016) for a recent review of the literature.

29 See Acharya and Yorulmazer (2008) for information contagion due to asset commonality and Ahnert and Bertsch (2015) for wake-up call contagion.

The build-up of risks in the so-called 'shadow banking sector,' comprising non-bank financial intermediaries, was an important contributing factor to the Great Financial Crisis of 2007/2008 (see, for example, Gorton and Metrick (2010)). When seen in this light, the expansion of new alternative non-bank credit providers can play an important role for financial stability going forward. Prior to the Great Financial Crisis, key problems originated in the securitization process, which transformed pools of loans into liquid assets that were eventually transferred off the banks' balance sheets. With regard to the marketplace online lending model, where platforms offer delegated investment and asset packaging services, it is therefore instructive to discuss in more depth the intersections of the FinTech credit space with the broader debate on non-bank financial intermediation and regulatory arbitrage.

To clarify, online lending platforms that are pursuing the classical P2P crowdlending business model, as depicted in Figure 1, are not shadow banks since they merely match the loan demand of borrowers with the supply of funds from investors, without engaging in activities that are at the core of commercial banking. Under this model digital financial technologies are used to directly match the loan demand of borrowers with the supply of funds from the crowd of investors. However, in recent years many online lending platforms have transformed into marketplace lenders and taken various steps towards reintermediation.<sup>30</sup> More specifically, some platforms in Sweden and elsewhere started to offer services that are at the core of bank-based financial intermediation such as maturity transformation, liquidity transformation, guaranteed returns for investors or balance sheet lending (see discussion in Sections 2.2 and 2.3).

Besides the growing exposure of banks to online lending platforms, this tendency towards reintermediation constitutes another source of potential financial stability risks. First, online lending platforms started to develop their role as information providers and replaced auctions for the loan pricing with algorithms that allow to speed up loan origination. This was possible with the increasing availability of data, which facilitates automated credit scoring and loan pricing.

Next, online lending platforms broadened their investor base, adopting the marketplace lending model depicted in Figure 2. This included taking a more active role as a middleman in the allocation of funds, both on the retail investor side where marketplace lending entails automated investment services and on the institutional investor side where platforms allocate loans across different loan pools and funds. Taken together, online lending platforms became information and investment intermediaries.

More recently, online lending platforms also started to engage in balance sheet lending. Under this model platforms do not only have reputational skin in the game, but also direct financial investments in the loan pools. This gives platforms a credit risk management function, which is not dissimilar to the one of commercial banks. In addition, some platforms assumed additional roles of a financial intermediary such as the provision of liquidity services and guaranteed returns.

From the viewpoint of financial regulators, the expansion of FinTech credit can be a potential concern if a significant share of credit activity migrates outside the regulatory perimeter, due to the absence of a comprehensive regulatory framework for FinTech credit. Given the trend towards an increasing share of passive institutional investors, the platforms play a key role in screening loans. Platforms are at the same time rating agencies and providers of delegated investment services. This constellation is prone to confidence shocks in the case of unexpected losses, similar to what we experienced in the securitization market during the Great Financial Crisis. The problem can be amplified by a lack of transparency and opaque lending standards of online lending platforms.

The existence of a lightly regulated FinTech credit sector can lead to regulatory leakage, with commercial banks shifting capital-intensive lending activities to online lending

<sup>30</sup> Bayluk and Davydenko (2018) gives a good review, taking the example of Prosper.

platforms. In principle, the migration of risky credit activity to the FinTech sector may reduce the fragility of the banking sector and improve financial stability. This is the case if the re-allocation of credit is associated with a full transfer of credit risk to investors with a high loss bearing capacity. Such a situation may arise if banks refer their riskiest borrowers to online lending platforms which receive the majority of funding from non-levered long-term oriented investors such as insurance companies. Another aspect that may contribute to banking sector stability is that FinTech credit tends to be junior to bank credit (for example longer maturity and less use of loan covenants). As a result, banks are less likely to suffer a credit loss if the same borrowers are also taking a credit from an online lending platform, which takes the first losses. However, the overall financial stability implications are likely to be less favourable if levered institutional investors such as commercial banks are taking large exposures to online lending platforms. In addition, the previously discussed trends towards a reintermediation of FinTech credit raise questions regarding the fragility of platforms and the potential build up hidden risks in a new branch of the shadow banking sector.

Chinese online lending platforms already comprise a significant part of non-bank financial intermediation in China. Since the Chinese FinTech credit market is by far the largest in size, its development may be informative for other jurisdictions. This is because many platforms have adopted business models that incorporate features which are at the core of banking, such as the possibility to withdraw funds or guaranteed returns that are often backed up by in-transparent arrangements, including platform loss insurance funds and third-party guarantees from insurance companies. From a financial stability viewpoint a major risk is the connectedness of non-bank financial intermediaries with the rest of the financial sector. Going forward, an increasing number of Chinese online lending platforms is expected to be partially or fully owned by financial institutions such as insurance companies and banks.

## 4.2 Untested business models

This section discusses in more detail sources of risk that stem from untested business models of online lending platforms, as well as magnifying factors. In contrast to commercial banks, online lending platforms do not face the risk of runs as long as they don't offer investors the possibility to withdraw their funds prematurely, thereby creating a maturity mismatch. However, platforms are exposed to the risk of a sudden dry-up in origination volumes, which can have profound implications. As described in Section 2.2, platforms typically rely on income from loan origination fees, loan-servicing fees and other fees charged for the platform's investment services. For most platforms the main source of income are loan origination fees that accrue at the point of issuance. This sharply differs from commercial banks who typically earn most of their income from the spread between lending and borrowing rates. To date, most platforms are loss-making and invest in growing their businesses with the desire to achieve economies of scale and network effects. As a result, a sudden dry-up in loan origination volumes can quickly endanger the solvency of online lending platforms. The risk of such a scenario is highest during an economic downturn. Hence, an important question is: Are the business models of online lending platforms able to weather a severe economic downturn?

Besides the reliance of platforms on fee income from loan originations, other destabilizing factors include the heavy reliance on algorithmic credit risk assessment models, potential operational weaknesses and the focus of many platforms towards riskier borrower segments. In the scenario of an economic downturn, the loan performance is expected to take a hit and investors may respond by ceasing to re-invest funds or even by withdrawing invested funds if platforms allow them to do so. To prevent investor withdrawals, platforms will need to tighten their lending standards by reassessing the calibration of their credit and loan pricing models. Such a tightening of lending standards is likely to result in a reduction in origination volumes, especially for online lending platforms that have been growing

strongest in riskier borrower categories. Since a large part of the platforms' income is tied to loan origination activity, it remains to be seen how well online lending platforms can cope with a prolonged downturn.

The previously described risk of dry-ups in online lending platform origination volumes is amplified for online lending platform operating a balance sheet lending model. Here online lending platforms take the first losses in the funds created for institutional investors, thereby further worsening the platform's financial position. At the same time, platforms need the resources to deal with a high number of non-performing loans. In the event of an economic downturn, especially unsecured consumer credit and unsecured credit to SMEs are prone to a sharp drop in loan performance. Cost-cutting measures are one avenue to contain losses stemming from cyclical fee income and from the write-downs on equity shares in institutional investor funds. Another avenue is to merge with other platforms or to partner with commercial banks that can provide funding. From a financial stability perspective, a sharp contraction of FinTech credit has negative implications for the credit availability in the market segments where online lending platforms have gained a significant market share. In addition, the growing exposure of the banking sector can be a concern, as discussed in Section 4.1.

Regarding the use of algorithmic credit risk assessment models, potential risks stem from the calibration of these models on data that has been generated during a decade-long economic expansion. Of course, also commercial banks are prone to these types of risks. However, online lending platform with their emphasis on fully automated credit risk assessment are to a considerable larger extent dependent on the soundness of models. Only few platforms publish stress tests of their loan books that try to gauge how severely loan performance will be hit in an economic downturn. As a result, investors and regulators have very limited information on how the platforms' underwriting standards, as well as its business models are coping with a recession. This uncertainty about the platform viability increases the risk of a loss of investor confidence.

Online lending platforms that offer liquidity services to investors by allowing them to withdraw their investments are likely to be especially prone to drops in loan performance. Typically, such platforms have loss provision funds that can be used to cover the first losses, or the platforms offer guaranteed returns that are backed by other financial institutions. Either way, investors purchase claims that are perceived as relatively safe, with the caveat that investors are potentially exposed to substantial credit or counterparty risk if the market experiences a negative shock. In the case of a severe economic downturn, loss provision funds are likely to be insufficient to withstand the losses.<sup>31</sup> Similarly, the loss-bearing capacity of financial institutions insuring platforms may be limited and unknown to investors.<sup>32</sup> As a result, platforms may find themselves in a situation where they have to suspend the possibility to withdraw funds. This has two implications akin to the well-known bank run problem. First, the suspension of the possibility to withdraw funds triggers a shock to investor confidence and, second, the anticipation of a potential suspension of withdrawals increases the incentives of individual investors to withdraw their funds early on at the first sight of a worsening in the loan performance. As a result, offering liquidity services can have profound implications for the stability of an online lending platform. A similar problem emerges if online lending platforms have many repeated borrowers who rely on rolling over their debt. In this case a reduction of funds from investors can abruptly end the

31 In an international comparison UK based online lending platforms are transparent regarding the size of their loss provision funds. For example a leading UK platform Ratesetter reports an interest coverage ratio of 117 per cent and capital coverage ratio of 231 per cent in March 2019. This means that investor returns are guaranteed, as long as market developments only moderately deviate from expected future loss scenarios. Instead, investor rates start to be negatively affected if realized losses exceed 117 per cent of expected future losses and the principal starts to be at risk if realized losses exceed 231 per cent. Such deviations from expected future losses are not unusual in an economic downturn, especially when many borrowers are in the riskier market segments.

32 A similar situation arose with AIG during the Great Financial Crisis.

repeated borrowing and trigger defaults by a larger number of borrowers who cannot access alternative sources of finance.

Another magnifying factor is the lack of dedicated resolution frameworks for online lending platforms, which can accelerate the loss of investor confidence. In fact, the closure of a platform is likely to significantly undermine the value of investors' claims. This is because the value of loans relies on the continuation of loan servicing which may be impaired when a platform goes bankrupt. During the financial crisis we experienced that non-bank financial firms have the potential to cause serious disruptions with implications for financial stability. A case in point is GE Capital, which put the entire General Electric corporation at risk in 2008. Bankruptcies of non-banks can be disruptive due to knock on effects for suppliers and customers. There are several factors which are likely to make bankruptcies of online lending platforms particularly disruptive. One factor is the aforementioned lack of resolution frameworks, which endangers a continued loan servicing. Another factor is that some loans originated on online lending platforms may be harder to sell off due to the lack of well-established funding markets in conjunction with a lack of understanding of the new business models and underwriting technologies. In addition, the experience of the Trustbuddy bankruptcy and the market turmoil in China have shown that guaranteed returns and an ambiguous allocation of ownership of loans can further complicate bankruptcies.

Other potential risks can stem from operational weaknesses and governance problems paired with insufficient oversight. The lessons we can draw from the scandals and platform failures discussed in Section 3.3 are a case in point. Governance problems span from transparency about the underwriting standards to conflicts of interest in the discretionary allocation of loans to different pools. The confidence in the underwriting standards of online lending platforms relies to large extent in the platforms reputation and track record. Unlike banks, online lending platforms have only very limited skin in the game besides their reputation. Potential operational weaknesses span from IT security to insufficient compliance with anti-terrorist and anti-money laundering regulations.<sup>33</sup> These operational weaknesses are likely to be magnified by the rapid growth of online lending platforms.

Finally, with a view to the macroeconomic perspective, the targeting of riskier market segments may fuel household over-indebtedness. Related concerns are typically discussed in the context of consumer protection (see Section 3.2). Ultimately they are, however, also relevant from the monetary policy and macro-prudential policy provided FinTech credit continues to grow in importance (see, for example discussion on the risks of household indebtedness in Sveriges Riksbank Financial Stability Report 2018:1 (2018)).

## 5 Concluding remarks

New financial technologies, which are commonly referred to as FinTech, have the potential to transform established business models in banking and finance. The focus of this article is on credit originated by online lending platforms, which use digital technologies to match borrowers and lenders without the need of a bank or other financial institutions to act as a middleman. We analyse how online lending platforms differ from commercial banks and study the main trends regarding the evolution of business models in the largest FinTech credit markets in China, the United States and the United Kingdom. Moreover, this article is the first to map the development of the Swedish FinTech credit sector.

With an origination volume of more than SEK 2bn new loans in 2018, the market share captured by Swedish online lending platforms is still small relative to total bank lending.

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<sup>33</sup> A report by the European Banking Authority provides an overview of the risk drivers (EBA 2015). An example of problems with anti-terrorist finance regulations is Prosper, which originated a loan that was used to purchase weapons and explosives by one of the 2015 San Bernardino terror attack shooters.

However, the Swedish online lending market has expanded rapidly in recent years. Judging from the developments in more mature online lending markets, the expansion of FinTech credit in Sweden is likely to continue and it is plausible to expect that commercial banks will seek to play an active role in the FinTech credit market, be it via ownerships of online lending platforms, via partnerships or as institutional investors.

From a financial stability perspective, the most relevant aspects are the growing exposure of commercial banks to alternative non-bank credit providers such as online lending platforms, as well as the trends towards a reintermediation of FinTech credit. The analysis in this article does not provide evidence suggesting that online lending platforms could, at the current market size, pose any significant risk to the broader financial system. However, we see that changes in the rapidly expanding FinTech credit space can happen fast and new FinTech-enabled structures can evolve in a way that in the future may necessitate further analysis to understand emerging risks.

Going forward, much can be learned about the viability of the different FinTech credit business models and the banking sector's response to the new developments. We regard our article as a first step in this direction and see merits in more research. The available data for the Swedish FinTech credit market is limited. Granular loan-level information would allow to better understand the drivers of the expansion of online lending specific to the Swedish market and to analyse the borrower and investor segments targeted by online lending platforms.

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## Appendix

### Box 1. Trustbuddy scandal in Sweden

Sweden experienced one of the first cases of a fraudulent bankruptcy of an online lending platform. In October 2015 the platform Trustbuddy closed due to heavy losses and proven misconduct. Trustbuddy was listed on the NASDAQ OMX Nordic exchange since 2014. The platform pursued a questionable business model from the start that could hardly be viable. Trustbuddy promised returns in the double digits paired with a non-existent or insufficient insurance fund to cover losses from bad loans. In addition, lenders could withdraw up to 90 per cent of their investments, provided the loans could be matched with other investors. Subsequently, loan losses lead to fraudulent conduct starting in June 2010.<sup>34</sup> To cover the losses from bad loans, the platform raised additional capital from new investors. The new investors were promised that their funds are invested in new loans. Instead, their funds were diverted to pay off other investors. In fact, Trustbuddy transferred loans that have gone to debt collection between investors. Such conduct contrasts with a proper assignment of ownership of investor shares in the loans originated on the platform, as depicted in Figure 1.

During its operations from 2010 to 2015 around 23 per cent of the total investments brokered by the platform were assigned to bad loans, totaling SEK 244m. Moreover, investor claims amounting to a value of approximately SEK 37m have not been assigned to borrowers. Additionally, there was a discrepancy of SEK 44m between the funds from borrowers that were repaid and the claims of investors. Eventually, the platform filed for bankruptcy in October 2015 after Finansinspektionen ordered it to terminate operations. At the point of closure loans amounting to a total of SEK 302m were outstanding with 3,500 investors affected. The bankruptcy procedure was complicated by the unclear ownership of claims against borrowers and due to a lack of a dedicated resolution framework for online lending platforms. One contentious question was whether to sell off the debts immediately, or to engage a collection agency to pursue the outstanding loans.

In retrospect, the scandal may have slowed down the expansion of the Swedish online lending sector.

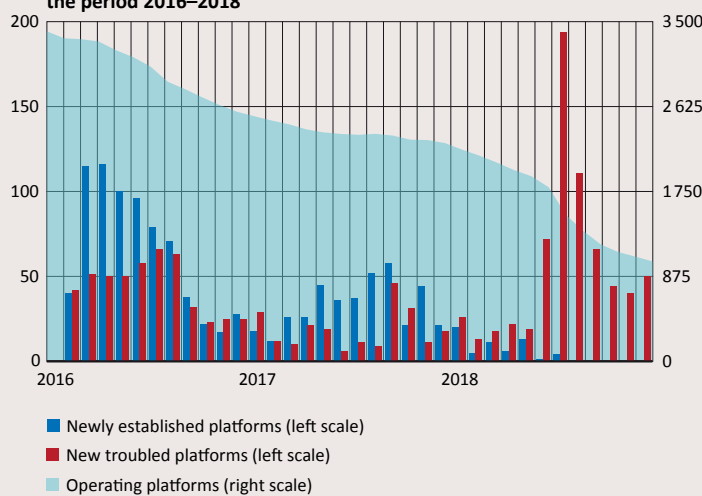
<sup>34</sup> See Lindahl (2016) for a press release by the law firm Lindahl, which managed the liquidation.

### Box 2. Market consolidation and market turmoil in China

China has the by far largest FinTech credit sector with thousands of online lending platforms. The market is very diverse and there has been a sustained trend towards market consolidation. The Chinese online lending market has received increased regulatory scrutiny, especially after the market turmoil erupting in summer 2018 featuring numerous cases of fraud and failures of platforms.

As mentioned earlier, the availability of bank-based consumer credit in China is only limited. Unregulated online lending platforms seized the opportunity to capture a large underserved market. The strong growth of platforms is facilitated by their ability to attract high funding volumes by offering a significantly higher return to investors than bank deposits. Due to the lack of a centralized credit registry the borrower information tends to be of a considerably worse quality relative to the US or UK markets. Moreover, the lack of experience in lending to risky consumer credit market segments, together with a strong drive for rapid expansion resulted in a large number of unsound business models and failures of online lending platforms.

**Figure A.1. Consolidation in the Chinese FinTech credit market over the period 2016–2018**



Source: Home of Online Lending (wdzj.com)

Figure A.1 shows the consolidation in the Chinese FinTech credit market. The total number of operating platforms more than halved during the last two years dropping from 3,401 platforms in January 2016 to 1,207 platforms in October 2018. The high number of exiting platforms is also reflected in the large number of platforms that have been identified by the Chinese P2P data provider Home of Online Lending as 'troubled'. Home of Online Lending classifies platforms as troubled if they are either subject to a fraud related investigation from authorities, when investors face difficulties withdrawing cash, when it is revealed that managers absconded money or when the website is closed. There are two major waves of exit; in the spring and summer of 2016 and in the summer of 2018. The consolidation of the industry is also reflected in the number of newly established platforms, which collapsed from an average of 65 in 2016 to an average of 5 in 2018.

Many platform closures are related to fraud or unsound business models. Incidences of fraud span from alleged Ponzi schemes to absconding of funds by managers. A prominent platform failure during the first wave of exit in early 2016 was Ezubao, which closed after it became public that the platform fabricated non-existing projects. The Ponzi scheme collected USD 7.6bn from around 900,000 individual investors. During the market turmoil erupting in summer 2018, investor confidence in online lending platforms was shattered by media reporting about egregious fraud and the inability of platforms to pay the high guaranteed returns that had been promised to investors. According to Kiff and Monroe (2019), the nationwide total losses could reach hundreds of billions of RMB, affecting millions of Chinese investors.

Another factor driving the large numbers of platform closures is a regulatory tightening starting in 2016, which intensified in the second half of 2018. In 2016 the Chinese authorities started to roll out ‘Interim Measures on the Administration of Business Activities of Online Lending Information Intermediaries’, which involved the mandatory registration of platforms, as well as custody accounts with banks.<sup>35</sup> The China Banking and Insurance Regulatory Commission (CBIRC) has taken over responsibilities of regulation and oversight in November 2018 and it is said that the CBIRC requires all platforms to complete a comprehensive licensing process by the end of June 2019. Moreover, online lending platforms are instructed to improve transparency about their ownership structure and about the transactions and investments.

From a financial stability viewpoint the contagious loss of confidence in the soundness of online lending platforms and their underwriting standards are an important concern, which the regulatory initiative seeks to address. The market turmoil of 2018 also demonstrated that the lack of dedicated resolution frameworks poses a significant obstacle in winding down collapsed platforms and in facilitating the continued servicing of loans. The implications can be severe disruptions affecting the broader financial system, strategic borrower defaults and low recovery rates for investors.

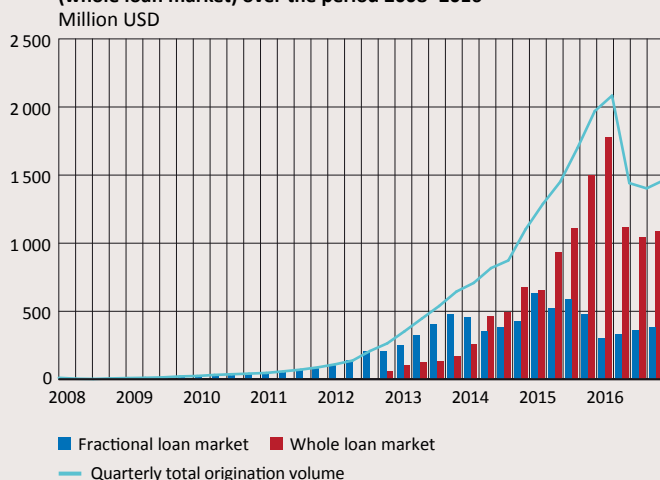
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<sup>35</sup> See the Financial Times article by Suya (2019) on ‘China’s Renrendai sees future in SMEs as P2P industry reels’, as well as the TechCrunch article by Liu (2018) on ‘The dramatic rise and fall of online P2P lending in China’.

### Box 3. LendingClub scandal in the US

The LendingClub scandal of May 2016 involved the largest US online lending platform, which disclosed wrong information to institutional investors on the platform and failed to disclose ownership interests of senior management in a fund that invests on the platform. As a consequence, Renaud Laplanche, the chief executive and chairman, stepped down on May 9, 2016 when an internal review was published and LendingClub's share price slid by more than 15 per cent in pre-market trading after the news was released. In the aftermath, the US Securities and Exchange commission (SEC) charged LendingClub Asset Management (LCAM) and Renaud Laplanche with fraud, accusing LCAM of misallocation of loans in its funds, undisclosed loan purchases to smooth out swings in investor demand, and undisclosed adjustments to the loan-pricing model. As part of a settlement, LCAM and senior management paid fines and Renaud Laplanche has been banned from the securities industry.

**Figure A.2. Evolution of the LendingClub funding flows from retail investors (fractional loan market) and institutional investors (whole loan market) over the period 2008–2016**



Sources: LendingClub loan book and 424B3 filings from the SEC's Edgar database; authors' calculations

An interesting aspect of the LendingClub scandal is that it allows us to study the effect of the shock on the platform itself and on the FinTech credit industry. Recall that the LendingClub platform caters to both retail and institutional investors as explained in Section 2.2. When the scandal erupted in May 2016, funding from institutional investors evaporated rapidly as can be seen in Figure A.2. The whole loan market volume experienced a sharp drop in the second quarter of 2016. At the same time, retail funding continued to be fairly stable and even increased in the second and third quarter of 2016. Part of the explanation is that most of the retail funding is channeled through LendingClub's automated investment service for retail clients that continuously re-invests the available funds from loan repayments.

This feature of relatively less stable funds from institutional investors is similar for commercial banks, who typically have a funding mix comprising relatively stable deposit funding and wholesale debt by flighty institutional investors. Given the low profitability of online lending platforms and their reliance on a continuous stream of fee income from originating loans, reputational shocks may lead to a platform closure and thereby endanger the loan servicing and investor returns. In the case of LendingClub, the platform suffered a prolonged reduction in origination volumes for several quarters. A timely corporate response during the unfolding scandal and improvements in the transparency and underwriting standards helped LendingClub to recover to previous levels of origination volumes in 2017. It remains to note that there have been moderate spillover effects to other platforms such as Prosper.