Final Report

Financing of Circular Business Models – Risks and Opportunities

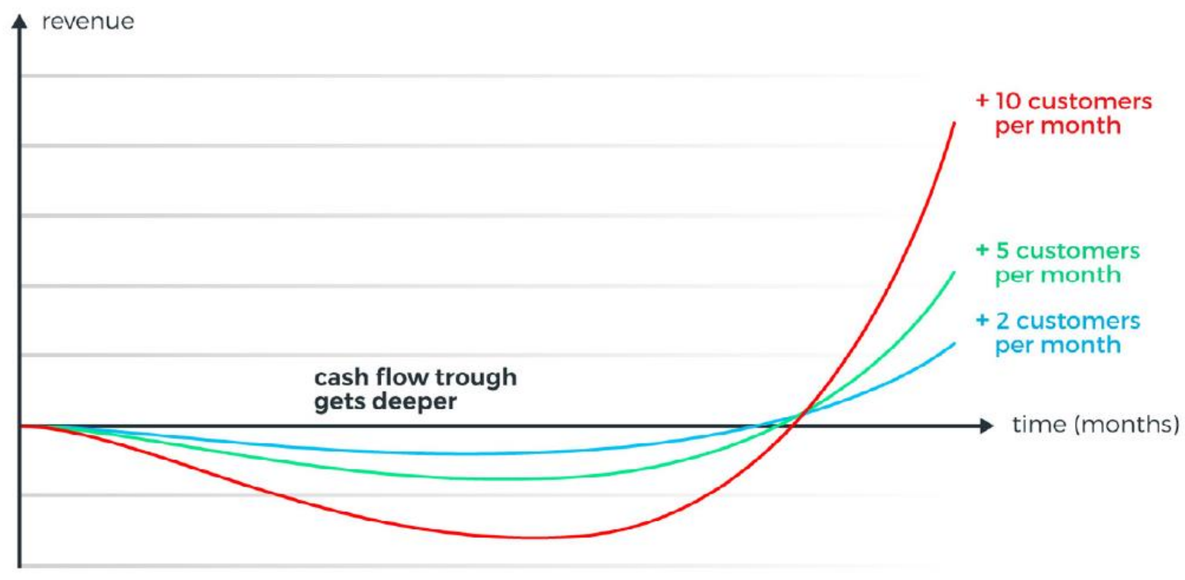
List of Content

Background

The great environmental challenges of our time - of which in recent years climate change has become the most severe and debated - require new solutions at the societal system level. Such a solution can be a circular economy, that is an economic system that radically increases resource productivity by circulating products and materials through re-use, re-production and recycling. Increased resource productivity has positive effects on energy use and climate, as well as on a number of other environmental areas such as water, land and sea use, toxicity and biodiversity. Circular business models are generally considered to be one of the main drivers of circular economy, and within them, product-as-service (PaaS) or functional sales models have a particular role to play as incentives for sustainable and long-lived products. Such models are considered to increase as business logic moves from a flow-oriented (selling as many products as quickly as possible) to a value preservation (be sure to preserve the product as long as possible) model (Stahel 2010).

It seems that manufacturing companies believe that one of the major obstacles for them to be able to shift their business model to more circular variants - such as selling product-as-a-service (PaaS) instead of selling the product itself - is the difficulty of obtaining financing. When a company moves to PaaS, the ownership of the product is maintained by the company, which has major consequences for the manufacturing company's balance sheet. Instead of the products disappearing from the balance sheet when they are sold, they will remain as an asset throughout the period that the company uses them for their rental / service activities. Hopefully - from a circular perspective - for many years. This means that the company's cash flow will change and the need for capital (own or via external financing) will increase in the short term (see Figure 1).

Figure 1. Cash flow gap



(Circle Economy 2016)

Several studies show that players in the financial market do not value long-term stable income and cash flows sufficiently high. They work with risk and credit assessments where the more short-term impact on cash flow and balance sheet and difficulties in determining the correct residual value for used products become a problem (e.g. Linder and Williander 2015). Some describe it as a "catch 22" situation: When one does not know the value of the asset/product used in a circular flow, one dares not to finance it and therefore, the circular flow, which could provide real value, does not get realised. Conversely, it may also be that linear risk, such as the availability of raw materials and price volatility, is currently undervalued (FinanCE 2016).

While rental and leasing models have existed and worked for long time in certain industries (such as automotive, larger construction machines, office machines, etc.), it seems that companies in new industries (such as consumer products) which are trying to adopt such models, are encountering major obstacles, e.g. with the financing. The problem also seems to be greatest for SMEs companies that are more dependent on external financing, than companies in larger groups, which often have stronger own funding resources. All in all, we see that the current banking sector's current approach to, and time perspective in risk assessment of loan decisions are a very strong force for lock-ups in our current linear paradigm. There are many indications that the established banks will further reduce their risk-taking.

From the literature review we carried out it has emerged that few scientific studies exist on circular economics and financing, that they do not focus on the business obstacles and opportunities and that no analysis of the role of financial actors in this area exists. However, it is interesting to note that several financial organisations have published documents - in the form of guidelines and short reports - on circular financing of companies, e.g. ING (2015), ABN AMRO (2018), IEMA (2018), the EIB (2015). They all emphasise the importance of taking into account sustainability issues in general within the business. They also confirm that circular economy is a way to attain positive environmental sustainability effects, while being an opportunity to achieve economic sustainability and financial goals. It seems that the most meaningful empirical results can be found in the Circle Economy report (2016), which contains descriptions of case studies by three Dutch companies.

Overall, we found that the need for more knowledge was paramount and that there was a necessity for an empirical study with Swedish manufacturing companies and Swedish banks and financiers. It was expected to considerably increase the knowledge situation in the area, something that should benefit both the Swedish industry and the Swedish financial sector that could also receive international attention.

Based on this, this project was funded by Vinnova (The Swedish Innovation Agency), and was implemented during the period 01-11-2017 and 30-09-2019, together with the project partners Kinnarps AB, Modul-System HH AB, Clean Motion AB, Ekobanken, JAK Medlemsbank and Sparbanken Sjuhärad. Susanne Olofsson and Thomas Polesie participated as sub-contractors.

Project implementation

The project consisted of four Work Packages, all led by RISE Viktoria in collaboration with two sub-contractors. The Work Packages were largely run in parallel from the start. However, WP2 and WP3 ended in April 2019, while WP1 and WP4 continued until the end of the project.

WP 1 – Project Management

The project management includes all activities that have to do with the project's planning, internal communication, administration and reporting to Vinnova.

The project's first joint meeting, a kick-off together with all project partners, took place on 19th January 2018. Then goals, purpose, plan and formalities of the project were presented, and project partners had an opportunity to meet each other.

On 11th October 2018, the project partners and the reference group gathered at Swedbank's premises in Gothenburg for a full-day meeting focusing on updates of status, challenges and opportunities for financing circular business models, both from the financial sector and manufacturing companies' perspective. The two manufacturing companies that participated had to present their "cases" and received feedback from other participants on how to proceed with their circular investments. In a specific activity the participants were encouraged to identify driving and restraining factors in achieving the proposed change of "A financial system that facilitates and accelerates the transition to circular business models and sustainability goals". The results of this exercise can be found in Appendix D.

On 14th March 2019, a workshop was held for all project partners, including the reference group, with a lecture by Iris van den Akker, Commercial Manager PaaS at ABN Amro, who shared her experience with financing PaaS business.

On 12th June 2019, an on-line meeting was conducted in order for the project partners to provide final feedback on the project's results, in the form of a final report, white paper and training material.

The project's research group had regular meetings to update each other, status and adjust the plan ahead.

In February 2019, the project research group decided to submit a conference contribution to the FRAP conference in Helsinki (see more under WP 4). As the conference takes place in September 2019, an extension to September of the project was requested and successfully granted by Vinnova. Other than that, the project was carried out according to the original plan.

The project research team reported to Vinnova on set dates as per the project plan.

WP 2 – Background and case study of product manufacturing companies

Within the framework of WP2, the data collection work for companies that produce and / or sell products was carried out.

Data collection included interviews and desktop research in the form of collection of statistics.

The interviews were mainly (ten of them) done with the companies participating in the project, either project partners (Clean Motion, Kinnarps, Modul-System and Textalk) or reference group members (Houdini and Toyota Material Handling). These provided very valuable information about their financing needs and their financing solutions, which resulted in updated interview templates and in-depth interviews on certain topics and themes, such as views on collateral and secondary market and what drives a changed business model. In addition, by applying the snowball method, we sought more companies to interview, especially those who are already implementing some form of PaaS model such as 2p1, ABB, Selecta, RP, Hr Björkman, Taiga and Hako.

The statistics collection was done on Retriever.se and via EU statistics on how SMEs finance themselves within the EU today (SAFE 2017). The purpose was to get an overview of similarities and differences in financing solutions for manufacturing companies, leasing companies, as well as a general picture of what today's SMEs in Sweden consider to be the major problems with financing in the case of a transition to a more circular business model.

WP 3 - Mapping the financial sector's opportunities

WP3 focused on data collection from the finance companies. This was mainly performed through interviews, after an initial and thorough literature review in the area. The few scientific articles that were found were read, as well as a number of studies by banks and interest groups, in particular in the Netherlands. Throughout the project, and especially in connection with the development of the two scientific articles, we performed further literature searches in order to find the latest published literature on the key project topics.

Eight interviews were conducted with project partners (Sparbanken Sjuhärad, JAK Member Bank and Ekobanken) and reference group members (Almi Företagspartner Väst and Almi Invest Väst). In addition, the snowball method provided additional contacts in the financial industry to interview including Danske Bank, Volvo Finans and Swedbank Finans. In a questionnaire, the finance companies in our project (including the reference group) were also asked about how they specifically agree to contracts as security. This questionnaire was answered by all financial companies, with the exception of Almi Invest who considered that this was not a relevant issue for them.

Within the framework of WP3, a benchmark study was also conducted with some European finance companies. These were interviewed, as they had been selected as examples of financiers who act relatively progressively in the area of financing circular business models. The selection was made together with our reference group member Circle Economy in the Netherlands. The interviewees were Circularity Capital in the UK, ING Bank, ABN Amro and Rabobank in the Netherlands.

In addition, representatives from three organisations - namely Dan Brännström, chairman of FAR (the Association of Authorised Public Accountants), Per Åsling, chairman of the Tax Committee of Riksdagen (The Swedish Parliament) and three persons at ACCA (The Association of Chartered Certified Accountants) - were interviewed slightly on the edge of the main purpose of the project. With the first interviewee, the theme was the evaluation of assets in companies. With the second interviewee, the focus was on opportunities and limitations with the tax route to achieve an increased share of functional sales. Lastly, ACCA was interviewed mainly on IFRS and accounting rules linked to Product-as-service models.

A shorter interview series with three owner representatives for the product manufacturing companies in the project (Carl Bennet, Modul-System, Sylvia Jacobsson, Kinnarps and Carl-Johan Björklund, Houdini Sportswear) was also conducted.

WP 4 - Analysis, compilation and dissemination of results

WP4 was jointly conducted by the research group during the project. Straight after the first interviews, we organised joint longer analysis meetings, in order to evaluate the results and make relevant adjustments to interview templates. Later, we drew preliminary conclusions from the collected material and developed the issues we wanted to dive in further. Analyses and syntheses were consistently documented and summarised below in this report.

The project's results are summarised - in addition to this final report - in a shorter White Paper, which is aimed at players in business and politics, with an interest in the area of circular financing. This is available in both Swedish and English.

The dissemination of results has also been made on an ongoing basis during the project, as we already had the opportunity in the spring of 2018 to share preliminary results with Ekobanken. Below is a list of the various events, articles, etc. where the research team was able to present work and results:

- Participation in the Ekobankens seminar on circular economics in connection with their annual general meeting in Järna, 20th April 2018. A recording of the seminar is available here: https://www.youtube.com/watch?v=YCw1fCF0hT4&feature=youtu.be
- Participation in the Climate Council Day in Stockholm, 5th May 2018, together with Ekobanken. The seminar is mentioned in an article in Miljömagasinet: http://www.miljomagasinet.se/artiklar/180516-en-sjudande-helg-klimatriksdagen-2018.html
- Participation in the seminar "Can Circular Economy Build a Sustainable Society with Space for All?" together with Ekobanken and Social Venture Network, 3rd July 2018 in Almedalen: http://program.almedalsveckan.info/event/user-view/51461
- Article about the project in FAR's newspaper Balans, 19th November 2018. https://www.tidningenbalans.se/nyheter/finansiering-av-cirkulara-affarsmodeller-het-fraga/
- Debate article "When the balance sheet becomes circular", in the FAR magazine Balance, 4th December 2018. https://www.tidningenbalans.se/debatt/nar-balansrakningen-blir-cirkular/
- Participation as an inspirational lecturer in a workshop on the Financial Sector on 7th May 2019 at IVA, Stockholm. The workshop was organised by IVA's Resource Efficiency and Circular Economy project and was attended by, among others, Handelsbanken, SEB and the Nordic Investment Bank. https://www.iva.se/internt-mote/rece-workshop-finansiella-sektorn/
- Participation as lecturer and in panel discussion in NMC's, Mistra's and the Dutch Embassy's seminar "The role of finance in accelerating the circular economy", 16th May 2019 in Stockholm. https://www.eventbrite.com/e/the-role-of-finance-in-accelerating-circular-business-models-registrering-59041815660
- Participation as inspiration lecturer in the Almi Företagspartner Västs event for corporate advisers at banks "Product-as-a-Service", in Gothenburg, 22nd May 2019.
- Participation as inspirational lecturer in a project meeting in the project "Increased competitiveness with circular economy" run by the County Administrative Board in Östergötland, Linköping University and Almi, 4th June 2019.
- Planned presentation of the project in webinar organised by IEMA, August 22nd, 2019.

The academic dissemination included the production of two conference articles and the participation in the corresponding conferences.

- Conference New Business Models for Sustainable Entrepreneurship, Innovation and Transformation, NBM 2019, 1st – 3rd July 2019 in Berlin. Article title: “When is Financing of Circular Business Models a Perceived Problem - A study of potentially correlated features”.
- Conference 17th Finance, Risk and Accounting Perspectives Conference, FRAP, 23rd – 25th September 2019 in Helsinki. Article title: Financing Circular Business Models – Proposed Future Research Agenda.

We also plan to develop the article on future research agenda (above) to a full journal article, aimed primarily at the well-reputed journal Business Strategy and the Environment.

Dissemination within the partner companies that participated in the project was also encouraged and supported by the project research team in March 2019 creating a basis for an internal training package for the companies. The material contained background and preliminary results from the project, and the purpose was partly to simplify education and knowledge enhancement within the companies (which had been identified as an existing problem), and partly to, through feedback of finished educational material, get further input to final project results. Three out of nine companies fed back on the material in writing. The educational material was packaged in the form of a power point presentation with instructions and templates for implementation. The material can be found in Appendix C and is free to use for all organisations that have an interest in the aforementioned problems.

Project results

The project set out the following hypotheses that required validating:

- H1 The new business model means that the manufacturing company will retain ownership of the product, i.e. the asset side of the balance sheet will grow.
- H2 Cash flow will deteriorate in the short-term but will remain stable over the long-term.
- H3 The problem is more prominent for SMEs without the possibility of self-financing.
- H4 For the financial sector there is a potential for good long-term business that today is missed due to existing risk models and views on collateral.

Answers to the aforementioned hypotheses are presented in the sections for **Product Manufacturing Companies** and **Finance companies**. First, however, we depict a brief review of the **Financial market for SMEs in Sweden**.

Finance market for the SMEs in Sweden

There are several different financing instruments and players that provide financing for SMEs. The various players have different focus and conditions for loans, equity or contributions. The instruments have different purpose, conditions and rules. Below is a review of the Swedish financial market for SMEs with regard to the type of capital, type of collateral, type of lender, type of leasing, evaluation rules and type of actors. To conclude, a shorter statistical report of the situation in Sweden today is given.

Type of capital

Loan capital

- Loan capital from various financial institutions is the basis for the loan capital market in Sweden. Examples of financial institutions that provide private loan capital are commercial banks, local savings banks, relatively new banks such as Ikano bank and Länsförsäkringar bank and others as well as niche banks such as Ekobanken and Collector. General commercial banks find it harder and harder to take high risk because of financial rules and state deposit guarantee, etc.
- Public lenders and foundations, such as Almi and Norrlandsfonden, have the task of supplementing the private loan market and the task is to also be able to take a higher risk.
- Finance companies (invoice borrowing, asset financing and leasing) and industry-specific finance companies and banks, for example Volvofinans Bank, mortgage assets. General finance and leasing companies usually require traditional low-risk collateral. Industry-specific players can take higher risk, due to their higher industry knowledge.
- Crowd Lending and also Crowd Funding where many contribute little capital (loan or ownership) and usually without security, which means big but limited for each lender. This is a relatively new opportunity that is starting to be regulated in the market. This way to finance has been attractive to idea-based and non-profit businesses.
- Loans from family and friends. This is a very important form of financing for many smaller and newly started companies.

Equity capital

- Equity, from owners and self-generated funds from the business. Having access to equity means that a company can take high risk if it suits the owner's direction. High degree of own financing is usually a requirement in early phases or at high risk since no or weak collateral is in the company. The requirement for own financing increases if the uncertainty is major.

- Investments that give ownership in the company can come from private individuals (business angels), Venture Capital (VC) (fund capital for seed funds and early phases) and Private Equity (PE) (fund capital in larger amounts and to companies in later phases). VC and PE players can be both public, such as Industrifonden and Almi Invest, and private, such as pension funds and other private investment funds. All these players seek value increase and hedged risks but can also take calculated high risk. This type of capital is called risk capital and is a time-limited ownership. VC invests in innovations and rapid growth and/or strong cash flow. PE wants to invest in more mature companies that can grow through structuring, etc. Since there is a lot of capital that seeks high returns, this type of actor takes a large part of the financial market for SMEs in a more mature phase.
- There is currently an increased number of evaluation-driven investors who place great emphasis on environmental sustainability, social factors and long-term economic horizon. These are called - with an English term - “impact investors”.
- Investment companies (usually as majority owners) typically have a strong long-term owner who manages by industry and business areas in their portfolio and can also be listed on a stock exchange. Examples include Latour, Industrivärden and Lifco.
- Stock exchanges (OMX Nasdaq and smaller lists such as Aktietorget) are generally more difficult to see in the long-term in self-financed high-risk projects, but more and more investors require sustainability and a long-term perspective in funds and listed companies. The stock exchange is usually not an option for SMEs, since the stock exchange requires trading in the share and requires that the company follow clear rules on information, etc. which can be difficult for SMEs.

Contribution

There are opportunities for SMEs to receive different types of public support or grants. Support can be linked to labour or investment. The degree of support varies across the country and there is a classification of regions and municipalities that determine the support levels. Support can come from authorities and government organisations such as the Employment Service (Arbetsförmedlingen) and the Swedish Agency for Economic and Regional Growth (Tillväxtverket), but also via regions and via EU funds. Almi Företagspartner also provides support in the form of, for instance, consultancy cheques.

Types of collateral for loans

Bail. To pay for someone else’s obligation to repay a debt. Cannot normally be withdrawn until the entire debt is repaid.

Mortgages (in property). A mortgage on a property must be obtained via the Land Survey. The mortgage has priority in the order in which they were taken out. The value of the property determines how large a mortgage can be borne by a property.

Corporate mortgage. A mortgage on a company’s fixed assets, except properties and land, in current assets and / or financial assets. Can be cash and bank, stock, patents and accounts receivable, etc. A corporate mortgage must be entered in the corporate mortgage register at the Swedish Companies Registration Office.

Collateral in the funded assets. See further under leasing.

Types of leasing

Leasing is a form of loan associated to an asset. Finance through leasing is offered by special finance companies, sometimes directly linked to a regular commercial bank but not always. One distinguishes between:

Finance leasing. The ownership, (economic benefits and risks), of what is financed is transferred to the lessee. Very similar to a "regular" loan financing of an asset that you buy and own. However, the lessor takes (usually) a mortgage on the item being financed and released when the lease contract is repaid in full.

Operational leasing. Very similar to a rental where ownership remains with the lessor. Often, some type of service and maintenance of the item is included in operational leasing.

What distinguishes these models is how companies - the lessors and the lessees – can handle depreciation, leasing costs and leasing income, for tax purposes. See further under the heading Evaluation rules and principles.

Evaluation rules and principles

We have looked at whether IFRS (International Financial Reporting Standard) accounting rules (market valuation) affect the possibilities of financing companies that apply a circular business model. IFRS is a recommendation for accounting for listed companies whose shares and bonds are listed on different markets and in different countries.

IFRS has been used since the 1980s. According to good accounting practice that applied earlier, it was important to be cautious about taking up assets in the balance sheet. The basis was against security, rather low values with great credibility and which constituted reserves in the operations, the so-called precautionary principle.

The need for new rules arose in companies with financial assets. The value of these was calculated by what one can count on floating into the future. These revenues must be formulated and discounted to a present value of any kind - therefore standards were needed to support them. The need for supporting rules increases with regard to calculations of future values of contracts when selling a product as a service.

Impact of new IFRS16 rules (FAR 2019):

- For the lessor there will be no difference in the income statement. For the lessee, the cost is moved from operating cost to interest expenses.
- Operating leases join the new rules more like financial leasing, in such a way that an operationally leased asset must be included in both the lessor and the lessee's balance sheet. With the new rules, the lessee must raise the value of the right of use as access and financing as a debt.
- Small (underlying assets worth less than $ 5,000) and short (less than 12 months) leases will not be affected by the new rules.
- In a linear sales model, inventory costs, under certain conditions, can be capitalised in the balance sheet. This can also be done in a PaaS model, but the rules for when it may be made become stricter.
- The tax calculation may be changed for both the lessor and the lessee due to changed deduction rights and depreciation rules (they will be contributed to the lessee rather than the lessor).

Types of actors

A bank can offer different types of bank loans: loans directly from the bank, mortgage companies or via finance companies. Banks can lend money from the bank's own funds. Security is almost always needed. There is a limitation that the bank must hold a shareholder's equity and that the bank has a state deposit guarantee that limits the risk and size of the loan that the bank wants or can take. The bank can hold operating loans as ordinary repayment loans and/or overdraft facilities.

The bank also uses so-called **mortgage companies,** i.e. companies external to the bank that specialise in real estate financing. The bank transfers these loans, but the loan does not charge the bank's equity.

The bank also provides financing through invoicing (factoring), as well as so-called asset financing and leasing. These are often located in separate companies, **factoring companies** or **finance companies**, and then the financing does not burden the bank's equity.

Mortgage companies may have different capital adequacy requirements than the bank due to another risk picture and can thus also make other assessments for financing a company or asset.

Table 1 below lists various financial actors recorded (both lenders and owner stakeholders) and classified according to a number of criteria that describe which financial products are provided and how the operator acts on the financial market:

- Type of financial product: loans, equity or contributions
- Private capital or state capital
- Time horizon
- Return requirements and interest terms
- Commitment and involvement from the financier: active or passive
- View risk
- Guarantees
- Evaluation criteria
- Evaluation controlled or not.

Table 1. Financial actors in the Swedish market for SMEs

Type of actor	What do they do?	Type of financing	equity (fund or share)	Private/Publ	Time persp. (S/M/L)	Rentability req (L/M/H	Engagement (L/M/H)	Examples	Collateral/security	Assessment criter	Risk-willingness (0-5)	Value c
Commercial banks	Lending to companies and individuals	Loan	NA	Private	S-L	L-M	K-L	SEB, Nordea, Sparbanker, Ekobanken, JAK	Corp mortgage, guarantee, mortgage	Repayment capacity, person	(0-3)	N
Finance companies	Object financing, leasing	Loan	NA	Private	S-M (1-5 yr)	M-H	L	Volvo Finans, DLL, GCE Capital	Object, contract	Repayment capacity, residual value	(0-3)	N
Public lenders and Foundations	Special purpose lending, contribution	Loan, contrib.	NA	Public, Private	S-M	L-M	L-H	Almi, Norrlandsfonden, Sparbanksstiftelser	Corp morgage, limitied gurantee	Growth potentail, repayment capacity	(2-4)	N/Y
Bonds	Focused loans	Loan	NA	Private	S-L	H	H	Gröna obligationer, statsobligationer	Corp mortgage, guarantee, mortgage, share	Repayment capacity, sustainability focus of object	(3-5)	N/Y
Business angels	Focused capital support	Equity	Share	Private	M-L	L-H	H	Zennström, Gates, Circularity Capital	Shares, board seat, preference shares	Rentability, values	(3-5)	N/Y
Investment companies	Business area development	Equity	Share	Private	M-L	H	H	Lifco, Investor, Latour	Shares, board seat	Rentability, industry structure	(3-5)	N/Y
Families	Own companies	Equity	Share	Private	L	L-H	H	Kamprad, L Svensson, Hogia, Kinnarps	Shares, board seat	Making a living, growth, values, lifestylel	(3-5)	N/Y
Stock exchages	Distributed ownership	Equity	Share	Private, Public	S-L	H	L-H	Sthlm Nasdaq, First North	Shares	Rentability, decided focus	(3-5)	N
Venture Capital fund	Early sowing for growth	Equity/convertibla loan	Fund	Private, Public	S-M	H	H	Norrsken, Almi Invest, Northzon, Creandum	Shares, board seat, shareholder contract	Rentability, decided focus	(3-5)	N/Y
Private Equity fund	Larger investment in mature phase	Equity/convertibla loan	Fund	Private	M-L (max 10 yr)	H	H	EQT, Nordic Capital, Capman	Shares, board seat, shareholder contract	Rentability, decided focus	(3-5)	N/Y
Pension fund	Pension management	Equity	Fund	Private, Public	L	H	L-H	AP-fonderna, AMF, SPP, KPA	Shares, board seat, board election committee	Rentability, decided focus	(2-4)	N/(Y)
Crowd Funding	Small contributions from many	Equity	Share	Private	S-M	L	L	CBC, Pepins, FundedBYME, Kickstarter	Shares	Rentability, values	(4-5)	N/Y
Crowd Lending	Small contributions from many	Loan	NA	Private	S-M	L	L	p2p (peer to peer) lån	Contracts	Repayment capacity, values	(4-5)	N/Y

Statistics concerning SMEs and financing in Sweden

According to some EU statistics (SAFE 2017), 9% of Swedish SMEs claim that financing is their biggest problem. This figure has stayed relatively stable around 10% over the last 10 years. The Swedish figure is higher than the EU average (7%) but considerably less than the three most important problem issues (finding competent staff, customers and competition), which are most important for between 17% and 24% of the companies surveyed.

The three most relevant ways of financing are equity (58%), leasing (47%) and overdraft facilities (44%). The most commonly used sources of finance over the past 6 months are overdraft facilities (29%). Bank loans are a relevant way to finance 32% of Swedish SMEs (compared to 48% across the EU). During the six months examined (April - Sep 2017), 25% of Swedish companies applied for bank loans and 6% refused to apply for a high risk of rejection. Of the 25% who applied, 25% either did not receive the entire amount applied for or waived due to excessive costs.

Among Swedish SMEs, 22% stated that their need for bank loans increased over the past 6 months. 57% felt that the need was the same and 18% that it had decreased. Regarding the need for leasing, 21% stated that the need increased, 71% that the need was unchanged and 6% that the need decreased. At the same time, it emerged that accessibility for both bank loans and leasing has increased (16 and 13% respectively) rather than decreased (5 and 2% respectively).

Funding was used primarily for investments in fixed assets (30%) and for inventories and working capital (18%). The development of new products and services was the reason for 9% of the financing requirements while 25% was used for other purposes (nor for employment or refinancing of bonds).

On the question of what funding would a company like to obtain in order to grow, 43% answered that they would prefer bank loans, 27% equity, 10% other loans and 9% other sources (for the EU, the figures for bank loans and equity are 64% and 6% respectively). The most restrictive factor for obtaining financing was collateral (7%). Other individual limiting factors are that there is no financing at all (4%), for high interest costs (3%). A total of 63% state that they do not see any limiting factor.

Summary of Financing SMEs

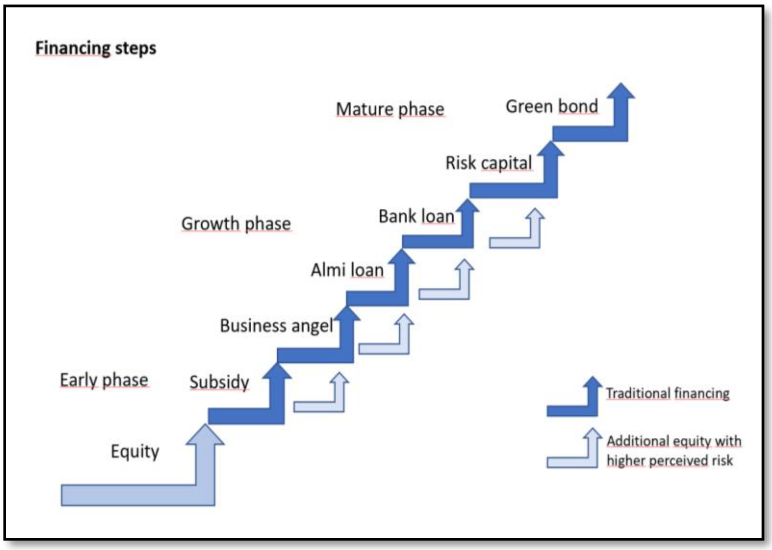
The most common way to finance an SME in Sweden today is through equity and bank loans, possibly also with a loan via Almi. How much of the financing is equity, depends on the industry and phase of the company's development. New start-ups and young companies that have not yet gained a stable or growing business and cash flow require a larger share of equity or ownership financing than an ongoing stable and growing company with good cash flows. The latter companies have good chances to finance themselves with bank loans.

If the founders of a company cannot on their own arrange their owner financing through their own money or from their family, an opportunity may be to bring in external owners who provide capital and also many times the skills needed for the company's development. The "prize" for taking in additional shareholders in the company is to share ownership, and possibly future profits, with other parties. Of course, this can also be an opportunity for the company to develop in a desirable way. The "mix" of own capital and borrowed capital in the individual company depends on networks and contacts, relationships, where the company has its registered office, which industry the company operates in, etc.

Usually the capital the company needs is built up by assessing the price is for each capital type. At the basis, there is the capital that the company owner can put into the company himself. The cheapest thereafter is if the company can get grants and development money and/or special term loans, then come bank loans. After bank loans or in combination with bank loans, there are Almi loans. After this, the company can, in exchange for shares, take in capital through new or former owners. Spreading ownership is considered the most patient capital (can wait for its return) but is also the most expensive one since the entrepreneur must share ownership of the company. See Figure 2 for a schematic view of this.

Clearly, companies that have a high risk in their business model require a larger share of equity or lenders who are willing to take a higher risk. In connection with a conversion to a new business logic, such as a circular business model, the credit risk is perceived to increase, and the company's owners need to take a greater risk by investing a larger proportion of the capital needed. When this is not possible, or the company is new or the owner and the company do not have reserves to take off, a problem arises between what society, customers and the company can and do both to drive towards a more sustainable and resource-efficient business model.

Figure 2. Forms of financing over time.



Product manufacturing companies

Description of product manufacturing companies

Our three case companies in the project differ from one another in several important points. In Appendix A, each company is portrayed in a greater detail, with a description of the current and desired positioning from both a circular and a financial perspective, and with an analysis of the individual challenges and needs of financing.

Hereafter we only highlight the crucial aspects that make up the differences between these companies and which are essential to their need for financing.

Kinnarps is an office furniture company that designs and manufactures furniture. Kinnarps was started up in 1942 as a family business and is still being run by the same family, now by the third generation. Kinnarps has a turnover of just over SEK 4 billion, of which about half is outside Sweden. Kinnarps has a classic and established linear business model and a clear sustainability profile with high circular ambitions. The company is at the beginning of its development towards rental and functional models and has carried out a few tests.

Houdini Sportswear designs and sells functional clothes for an active life. It was founded in 1993 and has from the beginning profiled itself as a company that wants to cause as little environmental impact as possible. The company works exclusively with different types of circular models (recycled materials in garments and garments that can be recycled), but rental and functional sales models are still a relatively small part of sales, although increasing. Today, the company has a turnover of SEK 190 million and is owned by the founders together with a small number of active owners, all of whom share the company's basic view of sustainability and the environment. Houdini works in a very entrepreneurial way, testing new models on a pilot scale to get quick feedback from the market.

Modul-System designs, manufactures and sells interior fittings for service cars (vans and smaller trucks). The company was founded in 1970 and was sold 20 years ago to a venture capital company. Since 2003, it has been owned by the investment company Lifco, which in turn is owned half by Carl Bennet and half by a distributed ownership on the stock exchange. Sales are just over SEK 200 million in Sweden, plus sales abroad that are not consolidated into Modul-System AB. Modul-System usually acts as a subcontractor to the automotive industry and thus does not have a direct relationship with its end customers. The company has a high profitability and a relatively low sustainability profile. Modul-System mainly seeks new business models through the addition of digital services and sees the transition to functional sales models as a very long-term project, which is now still in its infancy.

In order to deepen the understanding of the financing needs of different types of companies, we have also interviewed the following companies (which, however, are not described in in-depth case studies):

Clean Motion designs, manufactures and sells small light electric vehicles for taxi use. The company started out as a spin-off from Chalmers Technical University and is owned and operated by its founder. The company is in the start-up phase and has in recent years applied for capital via listing on the stock exchange (First North). The company has a turnover of SEK 5 million and liquidity problems. The company is looking for ways to expand both through linear models and through rental.

Toyota Material Handling is wholly owned by the global Toyota Group. With a turnover of SEK 1.5 billion and stable profitability, Toyota has rented trucks to companies in various industries since the 1960s, in both shorter and longer terms. The offer includes service/uptime agreements. The rental model is circular in nature (each truck is rented several times and sold on a secondary market at the end of the last rental period). The company has never had problems with financing its chosen rental business model. The business model has been selected on the basis that it was the most profitable one for the company.

2p1 manufactures lighting from used components and leases to property owners. The company started in 2013 and is run and owned - mainly - by the founder. Smaller owners are Almi Invest and a local venture capital company. The company is in its start-up phase, and since its inception, driven by sustainability and circular thinking. With a turnover of just under SEK 1 million, the company is struggling with both expansion and financing. 2p1 is looking for a long-term financing partner who can take both contracts and products as security.

Selecta buys and rents coffee and goods machines for a broad corporate market. The company has a turnover of just under SEK 1 billion with a low but, stable profitability. Selecta started 50-60 years ago (as Canteen) and has been owned by various US venture capital companies for several years. Since the beginning Selecta has used a rental model where the company leases machines for at least two rounds of 3-4 years, usually to the same customer. The offer includes coffee, service and repair. The sustainability work is linked to the coffee more than to the material in the machines. Financially, the company is strong with available capital within the Group, however, with the requirement to move more towards leasing plans towards its customers.

ABB is a global giant in electricity transmission, infrastructure, industry and transport. The company has sales of SEK 33 billion (in ABB AB) and the product line include a wide range of products, from electric motors, transformers and robots to switches and pushbuttons. Most of ABB's products are long-lived (40+ years), and the company has had difficulty in accelerating the circular development despite conscious investments. ABB is financially stable. The company is listed on the stock exchanges in Stockholm, New York and Zurich.

Hr Björkman has a turnover of MSEK 33 on the rental of entrance mats for companies and public enterprises, a circular business model that has been applied since the beginning. The company is owned by the family that founded it. The company has problems with the pace of expansion due to lack of funding.

Recycling Partner (RP) has a turnover of MSEK 45 and buys and sells used furniture. The furniture is reconditioned and, if necessary, repaired and sold with a 3-year warranty. Approximately 30% of the turnover is from rental of products and the company aims to steadily expand that part. RP is owned by the founders and a small group of people around them. Up to now, the expansion of the rental model has taken place via its own balance sheet. As renting out is expanding, financing will require new solutions.

Taiga started as a spin-off for the casual wear company Tenson AB in 1982 and has since then been 100 % family owned. Taiga designs, sources and sells industrial clothing for special needs, such as police, military, ambulance and electrical workers. Tests and leasing on a smaller scale have been underway for 10 years, something that the company aims to expand.

Hako is a reseller company within the German group Hako Werk. Hako Werk bought the company in 1999 after it was in the founder's ownership since 1973. Hako is the general agent and retailer for gardening and cleaning machines manufactured in the USA and Germany. Of the cleaning machines, about 50% are functional sales and have been so since the 1990s when customers (especially cleaning companies with municipal contracts) began to ask for it. The rental is partly financed by leasing and partly in their own balance sheet. The shares of these two models have shifted over time depending on the owners' attitude.

Critical Analysis of the product manufacturing companies

Through our studies of product manufacturing companies, we aimed to verify the following three hypotheses:

- H1 The new business model means that the manufacturing company will retain ownership of the product, i.e. the asset side of the balance sheet will grow.
- H2 Cash flow will deteriorate in the short term but will remain stable over the long term.
- H3 The problem is greatest for SMEs that don not have the possibility of self-financing.

We have also investigated some additional criteria of a company that could be related to the company's potential problem with financing. Table 2 shows these criteria with alternatives listed:

Table 2. Critical Analysis of product manufacturing companies

Criteria	**Data source**	**Alternative results**
Circular expansion plans	Interview	• Y – Yes, the company plans to expand its PaaS business model • N – No, no circular expansion plans
Is the availability of capital in relation to the shift, a problem or not?	Interview	• Y – Yes, the company has already encountered problems with financing • N → Y – The company expects to face problems when the expansion starts / continues • N – No, the company has not encountered and does not expect to face any problem with financing
Circular level (in terms of PaaS)	Interview	• L – No, or very small, existing PaaS business • M – Less than 50% of turnover is PaaS • H – More of 50% of turnover is PaaS
Ownership	Interview	• Family • Founder • Small control group • Investment company • Private equity funds • Stock Exchange (or a combination of the above)

The degree of maturity of the business	Yearly report	• Start-up – Less than 10 years on the market • Established – More than 10 years on the market
Financial stability (EBIDTA/turnover – average over 3 years)	Yearly report	• Unstable – Under 0% • Stable but low – Less than 5% • Stable – More than 5%
Size	Yearly report	• SME – Less than 500 MSEK turnover and less than 250 employees • Large – More than 500 MSEK turnover and more than 250 employees

Table 3 lists all the interviewed companies listed along with these criteria, based on interviews, and some public statistics (from allabolag.se):

Table 3: Classification of product manufacturing companies

Actor	Turnover (MSEK)	No of employee	Solvency (%)	Profitability EBITDA/Turnover (%)	Start-up/ Established	Part of larger group (Y/N	Type of own	SME/L	Circularity (PaaS) level	Circular expansion plans (Y/N)	(S) or transitioning (T)	Financing is a problem (Y/N
Modul-System	231	89	54	16	E	Y	Investment company	SME	N	N	T	N
Kinnarps	4137	2279	51	5	E	N	Family	L	L	Y	T	N --> Y
Clean Motion	5	9	44	-110	N	N	Family + stock exch	SME	L	Y	T	Y
Houdini	137	42	9	-3	E	N	Founder + value-driven owners	SME	L	Y	T	N --> Y
2p1	1	4	21	-156	N	N	Founder/family	SME	H	Y	S	Y
Toyota Material Handling	1523	437	26	4	E	Y	Group/stock exch	L	H	N	S	N
ABB	33030	8027	40	8	E	Y	Group/stock exch	L	L	N	T	N
Selecta	950	405	21	9	E	Y	Private equity fund	L	H	N	S	N
RP	45	30	50	6	E	N	Founder/family	SME	M	Y	T	N --> Y
Hr Björkman	33	27	45	13	E	N	Family	SME	H	y	S	N --> Y
Taiga	109	22	49	16	E	N	Family	SME	L	y	T	Y
Hako	449	129	64	5	E	Y	Investment company	L	M	Y	T	N

Conclusions of product manufacturing companies

All our interviewed companies state that they have expansion plans for circular models (product as a service), although everyone has come to a different stage of expansion. **Most companies also state that they have already experienced, or that they believe that they will experience, that financing will be a problem for the expansion**.

The open question of which criteria are related to the problems with financing gave the following results:

Level of circularity: Companies with a high, low and medium level of circularity in the company (i.e. share of turnover related to PaaS) are represented in both the group who have encountered problems with financing and in the group that have not. Thus, the level of circularity in itself does not seem to be correlated with the funding problem.

Ownership structure: All companies that have problems, or who expect to have problems during the expansion of PaaS models, are owned by a family, the founder and/or small dedicated owner groups. One company is also listed on a stock exchange. Companies that do not have problems with financing are either subsidiaries in a larger group or have financially strong owners, such as investment companies. Thus, there seems to be a correlation between financing problems and ownership structure.

The degree of maturity of the business: Start-up companies generally have issues with financing, which is also evident here. However, also established companies have problems with financing. Thus, the fact that a company is established does not guarantee that there will not be problems with financing.

Financial stability: All the companies that are financially unstable (i.e. start-up companies) have problems with financing. However, even companies with a stable financial situation have the same problem. Therefore, financial stability does not guarantee that a company does not have problems with financing.

Size: All the SMEs are experiencing problems with financing. None of the large companies, except for one, are facing issues with financing. The large company that is facing problems with financing is the only one of the established companies that has a low but stable profitability. Therefore, it seems that there is a correlation between financial issues and size, to a certain extent. In general, it seems that SMEs have problems more often than big companies, but the latter are not exempt from problems with financing.

It is not possible to compile any statistics and safe conclusions from this data, but the combined insight from these descriptive statistical facts seems to support the following conclusion on the correlation between different criteria in the company and problems with financing:

Even though a company is financially stable and has an established business, there is no guarantee that the expansion of PaaS can take place without the financing being specifically considered. SMEs are more likely to encounter problems than large companies. Companies owned by families, founders or small dedicated owner groups also come across more likely problems than companies that form part of a larger group or group of companies.

Finance companies

In the project we have interviewed the following financial actors:

- JAK Bank
- Ekobanken
- Sparbanken Sjuhärad
- Almi Företagspartner Väst
- Almi Invest Väst
- Danske Bank
- Volvofinans Bank
- Swedbank Finans

Description of the finance companies

Below is a summary of the financial actors that were interviewed:

JAK Medlemsbank is an “idea-based” bank with just over 34,000 members spread all over Sweden. To use the bank’s products and services, membership is required so that the bank’s customers and owners are on the same level, i.e. as members. The bank’s head office is located in Skövde.

The bank will promote the members’ financial interests by conducting banking activities that promote sustainable development for people, the environment and the economy. Products and services are priced according to the costs that the bank has and the surplus requirement that exists to secure future operations and long-term membership benefits. The bank strives to reduce debt in society by offering loan products that promote the borrower to become debt free. With its lending, the bank mainly caters to private individuals. The bank’s largest credit is about SEK 11 million. The bank demands adequate collateral.

In mid-2017, the bank began an extensive transformation journey, which among other things, included a change in its banking system in 2019. The new system entails a new platform for developing the bank’s product and service offering, which includes developing the bank’s offers to companies and organisations.

We assess the JAK bank’s risk profile to 0 - 1 on a scale of 0 - 5, where 0 = takes no risk.

Ekobanken is an “idea-based” member bank for sustainable companies, associations and foundations. Ekobanken aims to economically support socially and culturally oriented activities. The bank is a member of GABV (Global Alliance for Banking on Values) with the highest rating.

Ekobanken’s customers must be a member of the bank to borrow money. The bank has offices in Stockholm and Järna with customers across all Sweden.

The bank can lend a maximum of 25% of its capital base. However, the bank’s largest possible commitment is greater than that, i.e. up to SEK 80 million, for example when the National Board of Housing, Building and Planning (Boverket) sets out state guarantees for loans.

Ekobanken has strong valuation criteria for granting a loan. The most important one is what the money will be used for. The bank sets high transparency criteria and contracts with corporate customers to refrain from parts of banking confidentiality in order to be able to openly demonstrate their commitment. Ekobanken wants to put reasonable demands on its interest rates to customers. Today, the bank is too small to be able to be a full-range bank for its customers.

Ekobanken requires strong collateral in real estate and the guarantee in several stages (so-called “guarantee circles”). The customer’s repayment capacity in the form of profit and cash flow can sometimes be valued differently for idea-based businesses than for other companies. The bank promotes local perspective and the importance of good relations.

We assess the Ekobank’s risk profile to 0 on a scale of 0 - 5, where 0 = takes no risk.

> *"Ekobanken shall and wants to make a difference for many stakeholders, that is our return”*

Sparbanken Sjuhärad is a local savings bank that can make its own credit decisions, but is 47% partly owned by Swedbank. The bank has a tradition in and great knowledge on the industries that are strong in the Sjuhärad region - trade, logistics and real estate. The bank’s surplus is distributed to the owners (Swedbank and the local savings bank foundation). The dividend that goes to the local savings bank foundation shall be used for projects that provide social benefits.

Sparbanken Sjuhärad is a full-range business bank through its cooperation with Swedbank. The bank mainly operates in four of Sjuhärad’s municipalities (Borås, Bollebygd, Mark and Svenljunga).

The bank emphasises long-term relationships with its customers. The basis for positive credit decisions is always the repayment capacity of the business. Cash flow is very important as are owners, history, environment, product, market. The bank requires collateral in real estate or corporate mortgage, also a mortgage on shares and the owner's guarantee.

Representatives of the bank describe that traditional industrial investments are decreasing in the bank's geography and businesses in the trade bind less capital. Sustainability is given greater importance for "everyone" and this also affects the bank's credit decisions.

We estimate Sparbanken Sjuhärad's risk profile to 2-3 on a scale of 0 - 5, where 0 = takes no risk.

> "*We must move the bank's position forward"*

> *"An important question is: What is the value of a company in the new economy?"*

> *"It is easier to manage risks if the knowledge of an industry is good as well as understanding of contracts and contract design for the industries that are large in the region in which the bank operates".*

Danske Bank is one of Sweden's major commercial banks. The bank has a local bank board but is centrally managed from the head office located in Denmark.

The bank has a long-term perspective and weighs business risk against repayment ability. This means that there may be barriers for financing untested business models, especially in young companies with only one business leg to stand on. Profitability determines whether a customer can get financing. The representative of DB believes that a circular model fits when there are larger/more valuable assets, and which also has a secondary market. It is always a trade-off between short-term profitability and long-term repayment ability. The limit runs at approximately 3 years. Ethics and brands also affect the assessment of obtaining funding.

Today, the bank must show that it delivers value to its customers. The requirement for competence among all parties has increased.

The banks' risk-taking has declined due to fiscal policy rules, therefore many businesses are placed outside the bank today, e.g. in factoring and asset financing.

We assess Danske Bank's risk profile at 1 - 2 on a scale of 0 - 5, where 0 = takes no risk.

> *"Today, sustainability must permeate all business and business models. However, all businesses are not suitable for renting and recycling. It is very easy with larger products that also have a secondary market".*

Volvofinans Bank is a niche bank for vehicle financing and is owned 50% by Volvo Cars and 50% by Volvo's resellers. The bank only operates on the Swedish market. According to the bank, it is the market that controls the choice of business model and pricing. Car manufacturers need to push cars from factories that fully utilise their production capacity and, preferably, in growth. Customers demand flexibility, simplicity and a desire not to tie their capital and that the customer sees the car as a cost and not as an investment. The customer is prepared to add a certain amount per month for a complete car service. The car and relating services (insurance, service, financing and risk) must be bundled into a monthly cost. This means that the car service cannot be based solely on a cost estimate but must be calculated on what the customer is prepared to pay per month.

The subscription or car service may look different. What is weighed in is partly a rental period (from 1 hour to five years, depending on the player) and car model and equipment (where it is believed that the brand will continue to be important).

When buying a car in a traditional business model, the customer has taken the risk for the price in the secondary market. Service cars and company cars have been part of the business model to get cars to the private market where the private customer has bought the car for own ownership.

We assess Volvofinans Bank's risk profile to 3 on a scale of 0 - 5, where 0 = takes no risk. Within the time interval of 5 years, the Volvofinans feel great safety in the car.

> *"If the core business model becomes a subscription, two problems arise. First, the financing of the ownership or the car fleet and with whom or where this should lie. Second, the risk in pricing in the secondary market. Ultimately, it is profitability and economic factors that matter".*

Swedbank Finans (SB Finans) is a business area within Swedbank which solely finances movable property (formerly it was its own company within Swedbank).

New accounting rules mean that contracts (financial leasing) will be designated as purchases and must therefore be included in the borrower's balance sheet as an asset and as a liability. This may affect the companies' opportunities to finance their business. The consequence will be that the need for equity (ownership interest) will increase.

SB Finans thinks that there is a great difficulty in having control over where the products are located in a rental model, there is a risk that "collateral runs away". SB Finans has no opportunity to control this and this whole risk must be taken by the owner or the lessor.

So-called "leverage models" (a little equity and a lot of borrowed capital at a lower cost than the requirement for return on equity) are no longer an alternative due to new rules for deduction of interest rates (i.e. a ceiling has been introduced for interest deductions (see interview with the Tax Committee) compared to financing with equity.

> *"It is not possible to justify loans for a questionable or uncertain business model with only environmental arguments".*

Almi Företagspartner Väst (Almi Väst), is a public lender for SMEs in Västra Götaland. Almi Väst is owned by Almi Företagspartner AB, which is 51% owned by the state (under the Ministry of Enterprise) and 49% by the Västra Götaland region and Business Region Göteborg.

Almi's mission is to strengthen the development of Swedish business and promote sustainable growth and to contribute to the development and financing of SMEs. This is done by providing advice and loans to all industries except properties. The yield requirement for Almi as a whole is 2%. With this yield requirement, Almi can keep its capital intact. An average loan from Almi is SEK 600 - 700, with an amortisation period of 3 - 5 years. The interest rate terms are around 7 - 9% today. Almi always has lower priority than the bank in security terms, i.e. at a possible bankruptcy Almi will be repaid after the bank.

Almi takes out collateral in the form of corporate mortgage or mortgage deed corresponding to the loan amount. This is supplemented by 10 - 20% personal guarantee by the owner. Can also be supplemented with so-called "covenants", e.g. limitation of dividends to owners or solvency requirements. Almi does not count on the company's loan-to-value value but looks at repayment capacity in future cash flows, as well as the relationship and credibility of the contractor and management.

The person we interviewed at Almi Väst talked about the need for change capital in the process of change to a more sustainable business model. If society/politicians want to accelerate sustainable development, this funding could be increased through Almi.

We assess Almi Företagspartner Väst's risk profile to 3-4 on a scale of 0 - 5, where 0 = takes no risk.

> *" Almi for a sustainability dialogue at each credit assessment but the short-term repayment capacity weighs heavily on positive decision"*
>
> *"If Almi's owners want, then Almi could play a greater role in the conversion of existing SMEs, but Almi's administrators need more knowledge about circular economy, it cannot primarily depend on the individuals' interest".*

Almi Invest Väst is a public, EU-funded, venture capital fund with equity to SMEs in Västra Götaland and Halland. The goal for Almi Invest Väst is to carry out approximately 47 investments over a period of 6 years, then to manage them for a maximum of 6 years. The companies that Almi Invest can invest in may not be more than 5 years old and Almi Invest must always invest together with a new private investor (the so-called *pari passu* rule), this aims to guarantee the company's valuation. The norm for the valuation of the companies that Almi Invest invests in has developed to be 20% ownership compared to SEK 1.5-2.2 million in invested capital. Max is invested SEK 10 million in a single company. Almi Invest will be a market supplementing capital for early phases. Almi also has its own Clean Tech fund to which specific environmental companies are referred. Complementing the market means that the Fund, through its investments, should not displace private investors. It also means that private capital must set the conditions.

Almi invest is dependent on a future exit in its holdings but no exit strategy is regularly made for a new investment.

The fund wants to be an active investor who sits on company boards etc. Almi Invest's operations and administration may cost a maximum of 2.5% of the total assets under management.

Almi Invest's investment decision is made by a local investment committee. The assessment criteria include the team, the market, the product, the finances and the requirements for co-financing. Almi Invest invests in about 5 out of 100 proposals.

To date, almost 100% of the investments have taken place in companies that work with services or digital activities and preferably with rental models that provide early and stable revenue and cash flows.

We estimate Almi Invest Väst's risk profile to 3-4 on a scale of 0 - 5, where 0 = takes no risk.

> *"The overall goal for Almi Invest is employment and horizontal goals such as gender and to increase the level of knowledge about investment. The owner sets requirements for sustainability, but usually there is no room for such a discussion".*

Survey on contracts as security

A company that works with a circular business model, where ownership of the product remains with the manufacturing company faces both that a large inventory value is built up, and that the flow of revenue will be different compared to with a linear business. We asked our financial partners if customer contracts can provide adequate collateral for a loan.

The questions asked to Ekobanken, JAK banken, Almi Företagspartner Väst, Almi Invest Väst and Sparbanken Sjuhärad via a questionnaire were:

1. Under what conditions can contracts for subscription or rental of goods or service constitute the basis for adequate collateral in connection with a company's need for working capital?
2. If contracts can work as collateral, what loan-to-value ratio can you apply in that case?

From the answers we received, we understand that there are certain "problems" or uncertainties with contracts as collateral. The uncertainty is mainly related to the physical products that a service contains.

- Who has control over the products that the contract applies to?
- What is the stability of the contracts, what happens if the customers do not pay? Who can then take over the contracts and the products that the contact refers to?
- Is there a functioning secondary market? Is there a secondary value in the products?
- It is important to find the conditions that enable the bank to see the contracts as collateral.
- A clean service without a product binds "only" capital in staff. Staffing and personnel costs generally do not require as much working capital.

Benchmarking bank and finance market for circular business models outside Sweden

We have interviewed the following financial actors outside Sweden, in order to create a benchmark and a comparison for the Swedish financial players. The financial players were chosen based on their high profile in circular economy.

Circularity Capital. A niche venture capital player in the UK, created with the purpose of financing circular businesses. Circularity Capital finances SMEs across Europe through equity, with a time horizon of 3 - 7 years. Circularity Capital always combines its investments with strategic advice.

ABN Amro is one of the three largest banks in the Netherlands with a revenue of MEUR 9290 (2017). Circular economy and financing of PaaS is still a niche within ABN Amro, but there are clear goals to drive the business in this direction.

Rabobank is an association bank with a background as an agricultural cash register. Today, there is an income of MEUR 12001 (2017), and runs a clear line against circular financing, in the field of Sustainable Business Development. RB organises a "CE challenge" for its customers, which is a longer coaching programme to support customers' transformation into circular business models.

ING bank is the third of the three major Dutch banks, with a revenue of EUR 17876 million (2017). At ING Bank they have been working with circular economy and circular financing as part of Sustainable Finance since 2012. ING Bank is one of the real pioneers in the field. They also have a very clear climate agenda, through the so-called Terra Approach, where all credits will be assessed and certified against the Paris Goals.

ABN Amro, ING bank and Rabobank have jointly published a paper describing their common view on financing circular business models: Circular Economy Finance Guidelines (2018).

The most important lessons from the interviews with foreign financial actors are the following:

- All actors have dedicated departments and people who work with circular finances and to support customers in the transition to circular business models (In Circularity Capital's case, it's the whole company).
- All players state that since they started this journey (between 2 and 6 years ago), developments from the market, customer demand, regulation and general public debate have moved more and more in this direction and that there is no return.
- The banks state that it is a long journey for banks to change their views and processes on risk management and credit rating. The biggest challenge is the banks' own inertia and DNA. For all banks, circular economy is still a niche business, although growing. They work focused and with clear targets (e.g. for number of transactions, number of circular assets, carbon dioxide reduction etc) in order for the business to grow.
- All players are very clearly linking circular financing with business development and strategy consulting. The issue gives the players an opportunity to act as a strategic partner to their customers, as it also forces them to understand their customers' business models and future forecasts in more detail.
- The credit rating for circular business is considerably more forward-looking than in normal lending. Instead of taking a fixed asset as collateral (to a given historical value), one has to look at the business's potential ahead, and be able to take for example the contracts as collateral. The service content of the offer is often the key to profitability. Data and data sharing are also important enablers for these models. In principle, this speaks against pure asset financing arrangements.
    - *"From retrospective banking to future banking" - Rabobank.*
    - *"The servitisation component is the margin engine, not the asset itself" - ABN Amro*

- A difficulty in the evaluation of circular businesses in new industries is that there are no benchmark figures, with clear limit values for what should be considered as sufficiently good returns, sufficiently fast repayment rates, etc. The forecasts presented regarding earnings and cash flows cannot be simply set against similar previous business arrangements.
- Another difficulty is that in a PaaS model the break-even point is pushed forward in time. This will also be central to the discussion on the time aspect. The lender may need to be more sustainable.
- The bank can choose to take some risk and see it as part of its own learning process in order to build up experiences and abilities that become benchmarks and eventually new processes and credit check lists.
- The credit rating also includes valuing the customer's customers, since their ability to pay in the future is what secures your customer's business and repayment ability. In this way, an evaluation of the entire value chain (cycle) is built into the credit model. Some of the banks also see it as their task to work with match-making to achieve this (Rabobank, ING Bank).
- The possibility of taking the contract as collateral will depend on whether - in the event of a bankruptcy - there are other possible players who can take over the contracts and carry on the business, i.e. if the contracts are realisable. Of course, this is difficult for players in new circular markets, but should become simpler as more players get established.
- All actors also describe that collaborations with customers, customers' customers and between different financiers will need to be further developed to cover the needs of the circular expansion. At the beginning of a conversion, equity is important, later loans become more important and for larger and well-established companies "green bonds" can be an alternative. Different types of financial actors are required for these different stages. Banks and other financiers become a clear part of the new business ecosystem. Collaboration

between the banks to become stronger in communication and in relation to authorities is also important.

- Requirements, rules and laws from the state and the public sector are an important driving factor in the transition. Likewise, bank regulations will also be affected by a larger transition to circular finances.
- Companies with a linear model planning a transition to PaaS will need to be controlled with other key figures and followed up differently. At some point when this is scaled up, one can choose to place this activity separately (perhaps even in its own company) in order to avoid having to change the objective, key ratios etc. for the existing linear business.
- The financial market players are very important for a circular conversion to take place, as they have a direct impact on which projects receive capital and thus are implemented.

Conclusions Financial Companies

In table 3 all interviewed financial companies are classified according to a number of criteria:

- Type of financing offer
- Type of owner
- Financial visibility
- Required return
- Owner engagement
- Collateral
- Assessment criteria
- Risk propensity
- Value-driven, Y / N

Table 3. Classifications of finance companies

Actor	What do they do?	Type of financing/capital	Ägare	Time persp (S/M/L)	Rentability req (L/M/H)	Engagement (L/M/H	Collateral	Assessment criteria	Riskbenägenhet (0-5)	Value dri
Sparbanken Sjuhärad	Savings bank in the region of Sjuhärad. Lending to companies and individuals. Full service.	Loan	47% Swedbank, 2% personnel foundation, 51% Sparbanksstiftelsen	S-L	M	M	Real estate, corp mortgage, owner guarantee and share deeds	Repayment capacity, cash flow, person	2-3	N
Ekobanken	Membership bank with clear sustainability profile. Small niche bank. Lending to companies and individuals.	Loans (only to members)	Members	S-L	L?	H	Objects and assets. Gurantee and "guatantee rings" (multi security)	Sustainability (social, environment, culture). Lower req on bus case/cash flow	0	Y
JAK bank	Lending, payment services.	Loans (only to members)	Members	S-L	L	H?	Objects and assets	Normal credit assessment incl. cash flow etc.	0-1	Y
Danske Bank	Commercial bank. Lending to companies and individuals. Full service.	Loan	Stock exchange and larger owners	S-L	M-H	L	Real estate, corporate morgage, guarantee	Short time profitability, long term repayment capacity	1-2	N
Volvo Finans bank	Volvo's finance company. Financing of cars (fr pool to multiyear lease). Financial & operational leasing.	Object financing	50% Volvo Cars, 50% Volvo's resellers	S-M	H	L	The car	Car + rental time. Secon hand market/residual value	3	N
Swedbank Finans	Part of Swedbank AB, financing of movable property/objects.	Object financing	Stock exch (through Swedbank AB)	S-M	H	L	Movable property	Business case		N
Almi Företagspartner Väst	Develop and finance SMEs, thus contributing to sustainable growth in west Sweden.	Loan	51% state, 49% VGR	S-M	M	M-H	Owner gurantee, corporate mortgage, real estate or patent deed	Repayment capacity, cash flow, person	3-4	N
Almi Invest Väst	EU-funded venture capital company for developing west Sweden. Overall goal is employment.	Shares	Almi AB, via EU-grants	S-M	M	H	Shares	Team, market, product, bus case, co-investor, exit possibility	3-4	N
Rabobank	Membership bank, started as agriculture bank.	Loan	Members	S-L	L-M	M-H				
ABN Amro	Full service commercial bank	Loan	Stock exchange	S-L	L-M	M-H				
ING bank	Full service commercial bank	Loan	Stock exchange	S-L	L-M	M-H				
Circularity Capital	Venture capital company and strategic advisor for circular business.	Shares	Founders	K - M	M	H	Shares			Y

In summary, the financiers seem to be traditional in their security requirements and in the time aspect of repayment ability. New financial market rules mean that banks find it very difficult to take risks, but on the other hand there is a risk in remaining in an old system when society change in valuation of brands, towards sustainability concerns etc. And change can happen incredibly fast. Both product manufacturing and financial companies have the responsibility to develop their business models towards sustainability.

There are many indications that there will be a need for a new relationship between borrowed capital and equity. More equity will be required. There is a lot of risk-willing capital outside the banking system, but this often has very high demands on return on a given risk.

The financiers we interviewed have lifted several points that are included in the assessment to obtain funding. These are:

- Long-term and good customer relationship. Knowledge of what the customer's business is and who is the customer's customer.
- The collateral that the customer can present, preferably property or corporate mortgage, but also in new types of collateral such as contract.
- Repayment ability and cash flow in a proven business model but also in new models that may need to be re-evaluated in time.
- Credible business - sustainability over time. Nobody's brand should be compromised.
- Risk minimisation through shared risk with own contribution from the customer, the company's owner and the bank where the bank also has to take the risk of learning new things.
- At the same time, banks and other financiers and owners want to do profitable and sustainable business even in the future. At some point it becomes riskier to stay in a linear model than to switch to a new circular.

Owners' view of their own financing and product as a service

We have interviewed three different types of owners who are within the companies that participate in the project, owners of family businesses, owners of investment companies and owners of a private company with several shareholders.

The selection of owners is limited and therefore we cannot draw general conclusions from these interviews. We limit the description to how the respective owners view their own role and the financing of the company.

Family business

It may be interesting to have a longer-term responsibility for our products at the customer's premises, for example through a renting model, but for this to work, it must be:

- Profitable for both us as a producer and for the customer.
- It must also be environmentally sustainable so that transport and other things eat up cost and environmental benefits.
- A rental model could cost a little more short-term but must always be profitable in the longer term.
- A complication is fashion and trends when it comes to furniture. In that case, it must be "trendy" with sustainable design and to think sustainably.
- An important question is whether there is good business in a secondary market.

It must be a business model that makes a company survive over time, everything else is impossible. It must be profitable, and the customer must ask what can be delivered.

> *"The one who runs the market best is the customer's demand. We, as owners, also drive through our will and corporate philosophy, but it must always be driven in the economy, it should be simple and profitable otherwise it will not last in the long run".*

Value-driven company with several owners

Funders and owners must have greater perseverance in time. Venture capital funds must be prepare for longer process times and owners must realise that they need more endurance, which also requires a higher equity share. Investment companies will be the model that suits best and have greater endurance than venture capital funds. Today, there is a lot of private capital that does not look at monetary returns at all, but rather looks at the long-term perspective and that the world must survive over time, i.e. more focus on social and environmental factors. In order to survive in the long term, the company must find a business model that is sustainable both socially, environmentally and economically. Working with quality must be profitable for the company, the customer and the world.

> *"The risk lies in the sustainability of financiers and owners. It is a risk to switch to a new business model, but also a huge risk of remaining and supporting an unsustainable linear model. Somewhere it tips over to be less riskly to enter the new one"*

> *"We must have greater endurance and learn to consume quality that lasts longer. We must learn to make products that last over time and this also means major changes throughout the textile industry that are very much based on fashion and change with short cycles".*

Investment Companies

As always, the company must start from the market, from the customer. What does the customer want? What can the company offer? Is it profitable or not? If it is profitable, then banks should also be prepared to take part.

Companies need a higher equity ratio to be able to handle the transition. The questions that should be asked are the following:

1. Is there anything that fits the customer?
2. Can we find a profitable model?
3. Then the solution will follow. However, the time aspect in profitability can be a problem (i.e. the liquidity gap).

A good deal in the long-term must always be good for both parties. Otherwise it is not sustainable. This is not as obvious in B2C as in B2B environments (since a business stands and falls with good subcontractors and parties), but also in B2C, the consumer's view is very important and can have a huge impact.

> *"What is the alternative? Is there anyone else offering the same thing with direct profitability?! You have to be better than the alternatives! "*

> *"The profit and margin concepts govern development"*

> *"If you have a long-term idea in its ownership, it becomes obvious to include these issues. Profitable and sustainable in the long term. Short-term capital is a problem".*

Other results

Association of Authorised Public Accountants (FAR)

The interview with the Association of Authorised Public Accountants (AAPA - Föreningen Auktoriserade Revisorer (FAR) in Swedish) primarily concerned accounting aspects of circular business models. The following important aspects emerged:

- Normally, the lender/financier wants a security (property or occasional high-value asset) when they lend money. Corporate mortgages, such as inventories or agreements, could become more common. Inventory must then be valued with regard to its long life, rather than based on a certain - rapid - turnover rate. Evaluation at fair value for use or use.
- It should not be a problem to use degressive depreciation (more in the beginning than at the end) to write off an asset that is leased over time. This would better reflect the utility value than a straight-line depreciation. If the asset in question is upgraded and refurbished during the depreciation period, then it should be managed in the usual way, as improvement investments. Another way to handle upgrades - and ultimately circularly designed products - would be to use the “real value method”, i.e. a market valuation or value in use, i.e. the value is assessed continuously against the market and users (as per IFRS principles).
- Moving to a CBM may entail an increased capital requirement for increased capital tied up. It is important that the companies will be able to continue to deduct the interest expense so that financing does not become an obstacle for a CBM.

Tax Committee

The interview with the chairman of the Swedish Parliament’s Tax Committee, Per Åsling, was to determine where the political sphere is regarding the view of circular economy in general and the possibility of tax rules to accelerate the transition in particular. The following important aspects emerged:

- To implement a larger tax reform with a so-called “tax exchange” from labour to resource-intensive and environmentally harmful activities will come. This is driven not only by environmental thinking and circular economy, but also from the perspective of job creation and the need for more regional and local tax bases. A larger commission is likely to be appointed to review the tax system (as in 1991).
- The risk that the new deduction rules for interest rates (an EU directive that comes into force at year-end 2018-2019) will have a counteracting effect on the transition to circular rental and models for functional sales, is considered limited. But it is basically dependent on how large your business is. This is because there is a maximum level for the deduction right. The rules only counteract a lease expansion only if it requires such large borrowing that interest rates will be over SEK 5 million, or 30% of EBTA.

ACCA (Association of Chartered Certified Accountants)

The interview with ACCA was mainly about how “sustainability” and circularity aspects are handled in today’s global accounting rules and policies, and about how the new IFRS9 rules can affect the transition.

- Most of sustainability aspects are today handled as part of the descriptive part of “integrated reporting” and GRI. It does not affect the financial figures or how plants are valued at risk. New rules for managing risk, strategy and results in relation to climate have recently been launched (1.5 years ago), which may be the beginning of a more financial management. The market is looking for more meaningful information.

- When collateral must be taken outside the usual high-value facilities and the assets (such as real estate, machinery and equipment), business cases and liquidity become more important in the risk assessment. Perhaps new rules for prioritising claims on liquidation, or government guarantees, could support the growth of PaaS models?

ACCA's view of the new IFRS9 rules confirms the impact we described under the Financial Market for SMEs in Sweden - Valuation rules and principles.

Participation at Swedish House of Finance conferences at the Stockholm School of Economics

The project participated as an audience at two conferences on the theme of Sustainable Finance, organised by the Swedish House of Finance in May and August 2018. The purpose was above all to gain more insight on how sustainable finances at the macro level are managed and discussed in the financial academic environment. Below are some of the most important points that were raised:

- The finance sector still uses and research to a large extent on ESG (Environmental Social Governance) factors when evaluating sustainability. This is the traditional way of managing sustainability with a focus on reporting and policy rather than business. Instead, some begin to argue for so-called "Impact investment", or investment for societal benefit (ESG 2.0), which could include the financing of circular business models.
- ESG factors affect long-term investment decisions more than short-term. The time aspect (long or short-term) is up to each and every actor (CEO, investor, owner, lender) and should therefore not be seen as "embedded" in the system.
- It is better to handle non-sustainability (business, investment, asset) as a risk than to classify or regulate it.
- Politicians must set the playing field for sustainable finances. The financial market will not solve it itself, as long as linear / environmental risk does not become sufficiently concrete and high. Then the market could handle it itself.
- There are insights that belief in constant growth and increasing income gaps is one of the basic causes of crises. The real estate market is the example of this.
- There are insights that the global financial market is one of the major obstacles to preventing new financial crises.
- Should there be demands on banks not to have as much of the loans secured in real estate? Basically, real estate is not a productive investment.

Discussion

Discussion: product manufacturing company

Normally stable and profitable companies can test circular business models, in terms of leasing or functional sales, on a small scale without any special external financing. However, as soon as a functional sales model is to be scaled up the joint view of our interviewed companies is that external financing is required. At some point of the rental revenue share of total sales (and which may vary for different companies depending on financial position), liquidity in the short term will need to be strengthened when revenues are to a greater extent postponed into the future. This is what is called the “liquidity gap” in the literature. The stronger the own balance sheet is in terms of solvency and cash, the longer a company can manage without financial strengthening. The faster the scale-up of the rental models needs to take place, the more access to financing is needed.

In companies that started with a circular vision and model, the business has been adapted to the model, and the owners are fully rooted in and also have a great desire to work towards a circular business model. This means that there are owners and customers who are attracted to the company’s business model and values. An example of this is Houdini. A sustainable focus from the start creates a framework for what the company wants and also provides a timeframe to the pace at which the company can develop. Since the company is breaking new ground with its business model, the company is from the very beginning determined that much capital is required, which is also patient. When the cash flow becomes positive, it is possible for the company to move part of the financing to bank loans. Possibly loans from Almi could have been considered somewhat earlier than ordinary bank loans.

For existing companies wishing to move from a linear business model to a wholly or partly circular business model, the company must have its own reserves and owners who are willing to invest in testing a new business model. It is not likely that a bank would assume the full risk of a major change where the company goes from selling its products to renting with the consequence that the cash flow changes radically without the owners’ guarantees. One way for the company to reduce the risk is to gradually move via, for example, a product area/business area, or its own spin-off company, to learn about the consequences. Another alternative is that, for example, Almi could provide a loan for conversion to a circular business model. The type of financing needed is primarily the strengthening of working capital. Normally, this is provided with collateral through so-called corporate mortgage, where the creditor lends money with current assets, fixed assets (except properties) or financial assets as collateral. Common collateral for corporate mortgages is inventory and shares. The question in a circular business model is whether the rental/lease contract with the customer can be a satisfactory collateral for a loan in the same way than a stock in the case of linear sales.

For companies wanting to shift from linear to circular model, there is also a need for other types of investments and financing, for example for new technology development and mew machinery and equipment. In practice, this financing discussion becomes part of the total solution. This study has, however, focused in financing of working capital, to cover the so-called liquidity gap.

Development of thoughts around financial value versus utility value

A car has a lifetime of about 15 years today. The funding is for a maximum of 5 years. This means, for example, that a car needs to be economically written off in 5 years, or linger. But in that case, the question arises as to who takes the risk of the value of the car’s life between the years 6–15. Traditionally, this has been entirely on the customer who bought and owned the car. In the future the producer, the rental companies or other players in the secondary market, must take this risk. This is today one of the identified major problems in the rental model for cars. The hope is to achieve the positive effect that there is an incentive for the car manufacturers to produce more sustainable cars that can maintain a better secondary value so that the subscription fee can be extended for a longer period and that the monthly fee can thus be kept low or lower. Ultimately, it is profitability and economic factors that govern the choice of model.

Long-term balance sheet effects

The companies that switch to business models that are based on subscriptions and leasing will have a new structure on their balance sheet, provided that they retain ownership of the products. Higher inventory values will be built up, which will also increase capital, at least in the short term. One alternative is that we will see separate rental companies within the manufacturing group or in entirely separate rental companies. However, everything indicates that there are advantages for the manufacturing companies to retain ownership and to use reuse of materials and details and to have control over how the product is used including selling service services.

In a longer perspective - in a potentially much more circular future when most products are sold as a service or function - the balance sheet effects may be partially reduced. This is because the company that initially had to bind more capital to sell its products as a service, will also rent instead of buying the fixed assets they need in their business, production etc. The capital tied up then will decrease instead. This will probably vary widely in different industries, depending on which end product it is manufactured/provided and which plants, machines and equipment is needed for this in their business, but probably a broad impact for circular business models will have the effect of transferring assets between companies and between companies and consumers.

Another conceivable effect can be a restructuring of values - and thus power - in society. A few will own, many will use. This is basically an evaluation issue. What is most worth having, having access to and being able to use or to own and thereby be able to use? For individuals and companies, this is a priority issue but also a financing issue. For a bank as a financier, it can be fair to believe that private individuals will prioritise their housing and, in the future, will not borrow money to, for example, a car and a boat. It is also interesting to explore more about what a more central ownership of products will mean for the distribution of wealth and power in society.

Ownership financing increases in favour of bank financing

The banks' financial regulations mean that the requirement for corporate equity will increase. On the other hand, traditional bank financing is just one of several financing opportunities that companies have and which we have gained in the past century using. Everything indicates that ownership financing will increase and that this can be done in many different ways and through many different types of actors. There are currently many different types of investors, such as business angels, venture capital companies and funds, investment companies and others. There are also many different interests and orientations among investors. An example of this is investors who look at long-term sustainability with a strong value base in CSR etc. The banks will also develop their products outside the traditional bank loan, in order to remain a party to business with new and existing customers, but also to contribute to the long-term sustainability of the bank's own brand. One example of this is SEB's new venture capital company Fairpoint Capital.

The role of the public

New financial and environmental rules are strong means of pressure for change and changed behaviour both among individuals and companies. We know that more of this comes from tax changes and climate goals, etc. We also know that we need to change a lot in terms of consumption of raw materials and the use of fossil fuels, etc. At the same time, we also want to protect employment and tax revenues. The time is an important factor in the context as well as supporting innovation and using new energy-efficient technologies etc. Sweden has a goal assumed by the Swedish Parliament to achieve climate neutrality by 2045. This costs in investments and in having endurance in trying out new business models. SMEs are important for the local community and for employment, etc. At the same time, we know that existing smaller companies usually do not have financial resources for major changes. The state has an important role in facilitating restructuring investments by, for example, supporting positive choices such as, for example, providing contributions to solar energy or that the state could contribute with loans for conversion to favourable conditions. Almi Företagspartner or our regular banks could administer such an effort.

Accounting principles - depicting processes over time

Whatever measure the company chooses in its accounting, one must be prepared for them to be questioned by others. Critical review is part of the conversation between the company's various parties. It is not unusual for different principles to be set against each other. This may, for example, apply to environmental reporting or current market values of the company's assets. The important thing is to maintain contact between the reality behind the figures in the accounts. This position can be summarised as "substance over form". The business as such and its legitimacy comes first. Then you take a position on the responsibilities and how the business is to be described for others, measured and valued in money (Polesie 1995).

The ongoing operation is also the starting point. This is where the company's contribution to society comes. From there, the reasoning is passed on to the financing, where the company's conditions become visible in financial terms. When we revise and change business models and how we view values, there is also reason to review and revise accounting principles.

These principles become important to relate to, when the different items of the balance sheet change, as described in this report.

For real estate, other principles apply and valuations are performed according to market value, a reference to previously executed transactions in the same market. The market value is not stable and fluctuates according to how the market moves in supply and demand. If the interest rate rises, the value will be lower and the payments will be larger, with normal falling market value. The previous principle of prudent valuation of properties, that the valuation was low, was more stable and predictable and not so affected by the market's demand variations.

Financial assets in a balance sheet must be exchanged for money at some point in time. The value of the assets consists of what you paid for them or what someone is willing to pay you for the assets. This can be read on the market in stock prices or bond prices - but these values are not permanent.

Conclusions and recommendations

Based on our synthesis of all the results in the project (literature studies, interviews and workshops), we have compiled four lists of recommendations: One that caters to the companies who are planning a transition to circular business models; one that is aimed for the banks and financial institutions that want to be a part of this future market; one that caters to political decision makers; and lastly, a list of recommendations for continued research.

Conclusions and recommendations aimed at the manufacturing companies (who want to switch to PaaS/functional sales)

Financing is perhaps not the first problem that arises when a manufacturing company wants to switch to selling service, but when the need for flexible access to loans and capital arises, the following aspects are important to think and act on:

- A financier will always conduct a credit check based on a combination of assessment of the risk in the business, collateral and person. For a company in need of capital, there is a need to convince the lender that the business model is sustainable in the long term, not only environmentally and socially, but also financially. Financing will always be dependent on a good “business case” with sound revenue streams. Both pricing, contract times, cost calculations for maintenance, repair and service, etc. must withstand detailed examination.
- The offer must show greater benefit for the customer and thus, the potential for higher profitability than the corresponding linear model. It is therefore important to include the comparison with the existing linear model in the presentation of the business. It is crucial to demonstrate why the existing linear model is not sustainable in the long term.
- When the financier finds it difficult to find suitable benchmarks and comparative figures (because your model is new in the industry), there is a need to think about how this can be remedied. Is it possible to look outside Sweden? Is it possible to actively involve customers and their repayment ability in the assessment?
- If the products are low-value and normally cannot be taken as security, how can the company and the lender find a suitable form of security? Is there a secondary market where a residual market value can be found? Is it better that contracts and future revenue streams are seen as security? If so, who can take over the contracts if the business needs to be liquidated?
- As there is an increased risk, or at least a greater uncertainty, for the financier when financing circular models, we believe that it is very important for a financier to know that the owners of the company also take their share of the risk. In other words, this is about sharing the risk. Potentially, this can also strengthen the ties between companies and financiers and create more collaborative conditions than today.
- One of the biggest financial challenges with the conversion to circular business models is that when the balance sheet changes, the conditions for important key figures are also changed. Current assets may need to be redefined to fixed assets, working capital as well as capital employed, and key ratios such as return on capital employed (ROCE) and inventory turnover need to be revalued. In practice, this can mean that it becomes very difficult to control the company’s two activities (the linear and the circular) within the framework of the same economy model and governing principles. This can be solved by placing the circular business in a separate business area or even in a separate company.

Conclusions and recommendations for banks and other financiers

Circular economy is a megatrend that affects structures, models and opportunities throughout the economy. Banks and financiers, like other players in the economy, must relate to this. One of the most obvious and concrete examples of situations that require new ways of working and a partly new view of risk is when the increased capital requirement in the transition to circular business models needs to be financed with loans. Here are some advice and tips for financiers, based on collected data in the project.

- As a financier you are central to the success of the circular business models! As the one who decides on which projects are funded, you decide which projects will be implemented. You are a very important player in the transition to a radically more resource-efficient society.
- See the circular trip as a business opportunity for you as a financier! By learning more about your customer's business, you can position yourself not only as a financier, but also as a strategic advisor. This increases your opportunities not only to take correct credit decisions, but also to broaden your offerings and strengthen your business.
- Act long term! In circular business models, there is an inherent sustainability thinking and a long-term perspective in revenue streams, which must also reflect on the financial market and access to capital. Long-term capital will be an essential part of the restructuring, both on the ownership and loan financing side.
- Act as part of a business ecosystem! When it comes to both the valuation of repayment ability and the valuation of collateral, you need to look broader than usual on the challenge. If you cannot easily understand whether the customer's forecasted revenue is credible and relevant - talk to the customer's customers. If there does not seem to be a simple way of realizing contract values for a possible bankruptcy - talk to actors in similar industries, look outside Sweden's borders, set up collaborations with other financiers and try to create a knowledge base about this.
- It may be that it is necessary to take a slightly higher (perceived) risk initially to build the new knowledge needed to secure future business. There is also a risk of remaining in existing linear models, and at some point, it is a greater risk to remain with exposure to customers in existing models than to shift.
- Affect how you want this new market to work! Collaborate with other banks and financial actors, and act for the changes in rules and policies that you consider necessary for the financing situation to work well and be an opportunity and not an obstacle for companies that want to switch to circular models. Look at risks in another way. As a financier, you have the same responsibility to develop business models that are sustainable and that meet the product manufacturing companies and their customers' demands for sustainability.

Recommendations for policy makers

- If Swedish companies are to be able to switch to circular models and Sweden be a role model in the transition to a more circular economy, clear national goals are a must. The Dutch banks clearly point to the Dutch national goals as an important driving force for their own actions.
- Government funding in any form (guarantees, conversion loans or the like) could increase the pace of the transition to more circular business models. This could be done, for example, through directives to Almi, or through guarantees through banks.

Recommendations for further research

Based on the results of this project and a larger literature study based on searches in scientific databases, we recommend that continued research be done in the following five areas:

Evaluation of fixed assets

The transition to PaaS models affects the balance sheet, cash flow and thus the need for financing. What is less clear is the details of the balance sheet, including the valuation of assets. Accounting rules and valuation standards for assets are not currently set up to support long-term assets, which remain in stock for a long time, perhaps decades. According to current accounting definitions, items in stock for more than one year should be considered as a fixed asset or a fixed asset (Atrill & McLaney, 2013). The decision whether an asset is long-term or short-term will affect joint CPIs, such as capital turnover, return on capital employed (ROCE) and inventory turnover. Another problem is how to assess the residual value of assets that remain in stock for long periods. The difference in terms of value in use against financial value becomes important. We therefore propose that more research be done both to understand the effects on accounting rules and valuation standards for securities and case studies of companies that work with different models - and thus different sets of KPIs - in parallel.

Need for different types of capital over time

There is an awareness from both product manufacturing companies and financial actors that "sustainable business requires a sustainable economy". When more risky models or companies need funding, there is also an understanding that the more costly ownership financing (i.e. equity) becomes more important compared to loan financing, at least initially. These results indicate that a more varied set of capital sources or types of funding will be needed, depending on where in the expansion phase the company is, the type of business (products and services) involved and the collateral available. The dynamics of these changes, risks and new opportunities for different financiers have not been well described and we propose more in-depth research in this area.

The financial sector's processes, tools and methods

Financiers face new challenges and opportunities when customers switch to PaaS models. The challenges are related to PaaS developing in new industries: There is a shortage of "benchmarks" for comparing repayment times or profitability levels, lack of secondary markets for collateral and perhaps also the need for new collateral, for example contracts. The opportunities include customer relationships based on long-term stable cash flow and possible new credit products to enable this. We conclude that this change will affect many parts of the banks' and other financiers' activities, as their perspective on risk and creditworthiness must go from being retroactive "asset-based" to becoming more forward-looking "business-based". Relevant research on such a shift is still lacking. This includes effects on financing strategy, credit assessment and risk processes, and corresponding tools and methods.

Increased cross-sectoral knowledge, transparency and collaboration

The project's results point to the need for more collaboration between the product manufacturing companies and the financial actors. This is also in line with previous literature on the circular economy area, which emphasises the importance of more cross-sectoral cooperation (e.g. EMF, 2012). The lack of common "benchmarks" and collateral not only requires updated risk and credit assessment processes internally within the bank, but also a new type of cooperation between the bank and the customer. Increased industry knowledge, in the form of a deeper understanding of the customer’s business model, revenue streams and even customers’ customers is necessary, and this in turn requires greater openness between the players. New data sets and common values must be understood, described and adapted. The bank’s role will turn into a more active and strategic partner (rather than just a financier). We suggest that these common challenges and processes be investigated in broad research projects involving all relevant actors.

Integration of circular economic theory in financial theory and practice

Circular economy has been variously defined (Kirchherr et al., 2017). The descriptions often refer to materials that flow in different loops, cycles and circles, thereby avoiding waste both materially and economically. EMF (2012) speaks of “inner loops” and “cascades” as an enabling principle for a CE, Bocken et al. (2016) defines it in terms of “narrowing, reducing and slowing down loops" and the term “zero waste” is mentioned as a key principle (e.g. EMF, 2012; Stahel, 2010; European Commission 2018). Our research adds that sustainable business needs to be matched by sustainable and sustainable capital. We believe that this should have consequences not only for how the financial sector works at the micro and meso level, but also for the economy as a whole. What do circular principles mean, such as “reduced and slow loops” at macro level and for (global) financial markets? What does this mean for interest rates, fast repayment cycles and ever-increasing profitability and yield requirements? Are our current financial systems and theories at macroeconomic level ready for a CE logic at the micro and meso level? We believe there is a need to develop today’s CE theory with economic theory and practice at macro level.

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Appendices

A Case studies Product companies

To read the case studies, please contact the relevant company:

- Kinnarps AB, Martin Nyström
- Houdini Sportswear AB, Peter Karlsson
- Modul-System HH AB, Henrik Persson

B Statistical data

2017-safe-country_en
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C Training material

Finansiering cirkulära
affärsmodeller_Utbildı

D Workshop results

Workshopresultat_18
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