Investment and Financing in Logistics 10

Learning Objectives

Establishing and maintaining the logistics systems is capital-intensive. This is true for systems in both macro-logistics and micro-logistics. Therefore, issues of investment and financing play a central role in logistics. A cross-company view on supply chain management, on additional financial and investment figures, and – as a consequence – on the capital flows and payment processes in the financial supply chain offers additional approaches to optimize fragmentation and collaboration within value chains.

This chapter aims to familiarize the reader with the management of capital requirement, capital utilization, and net working capital. Different forms of investment financing will highlight the strategic significance of financing. Established and novel concepts relating to this will be presented and service providers for financing stock inventory, logistics real estate, and logistics movables will be introduced. By considering the various agents in logistics chains, the reader will be provided with guidelines as to the optimization of financing and of financing processes, and insights into the strategic and operational relationship between financing and logistics will be given.

Keywords

- Fixed assets
- Current assets
- Working capital
- Supply-chain finance
- Cash-to-cash-cycle
- Capital tie-up
- Leasing
- Pay on production

H. Gleissner and J.C. Femerling, *Logistics*, Springer Texts in Business and Economics,
DOI 10.1007/978-3-319-01769-3_10,

10.1 The Basics

10.1.1 Managing Capital Requirement, Origin of Capital and Capital Utilization

Investment and financing are areas of financial management within a company. Essentially, finance is the management of *capital requirement*, *origin of capital* (financing), and *capital utilization (investment)*.[1] Financing is defined as the procurement of required capital to make necessary operating investments. Depending on the kind of capital procurement, we can distinguish between external and internal financing. In cases of *external financing*, a company raises capital through individuals, banks, or through the capital market. *Internal financing* distinguishes between self-financing, provisions-based financing, and restructuring of assets through released capital. It is vital that internal financing be closely aligned with the operational performance processes and sales processes. As a consequence and in contrast to the management of external financing, internal financing must not solely be managed by the financial department of a company. Instead, the management of working capital, of capital requirement, and of capital utilization needs to be integrated into the management and leadership process of all other operational functions along the value chain in a goal-oriented manner. This also includes logistical functions and supply chain management, as illustrated in Fig. 10.1.[2]

Forms of financing and financial instruments can be differentiated according to a variety of criteria. In cases of external financing, these instruments are commercial credits and bank loans, credit substitutes, and special forms of financing of current assets. A company may also rely on short-term financing in the form of e.g. bank overdrafts, trade credits, or loans to customers (commercial credits) (see Sect. 10.2.1). Regardless of the forms of financing, all *credit and capital relationships* of a company are usually recorded on the balance sheet on a specific balance sheet date. The balance sheet itemizes a company's assets and liabilities and shows its equity and capital as the sum of all financial obligations towards owners and creditors. The asset side of a balance sheet discloses how the assets have been utilized while the liabilities side reveals the source of funds, i.e. it lists all claims of equity providers and debt capital providers.

Investments are made to acquire or provide capacities in the areas of procurement, production, distribution, and disposal, which are all closely intertwined with logistic functions. We can distinguish between real investments (manufacturing plants, semi-finished and finished products), immaterial investments (investments in research and development) and financial investments (equity rights, legal claims). Further distinctions can be drawn between original or initial investments for the (initial) generation of capacities and investments in expansion, replacement,

[1] Cf. Peridon et al. (2009), p. 10.

[2] Cf. Pfohl et al. (2003), p. 21.

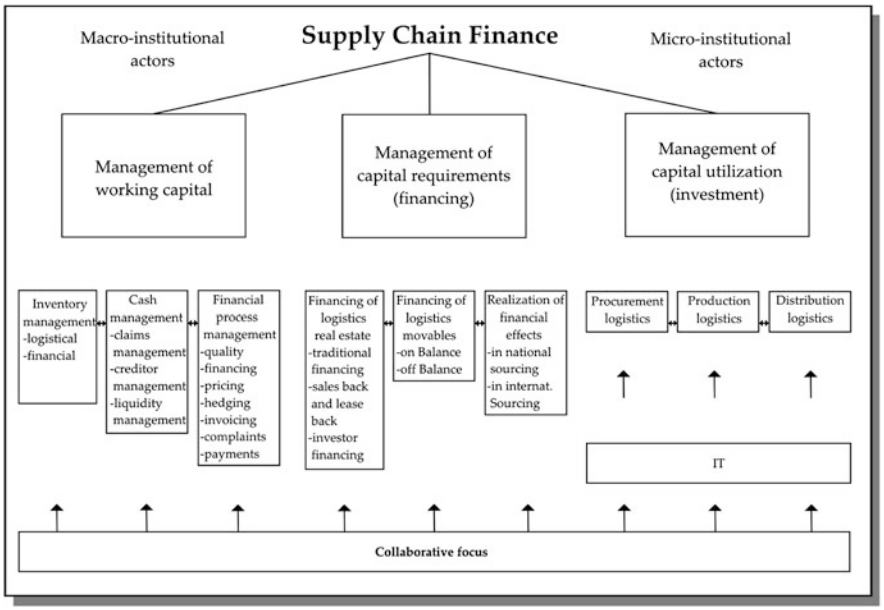

Fig. 10.1 Financial processes in logistics and supply chain management (Cf. Jehle and von Haaren (2008), p. 4)

and maintenance. The latter types may also be categorized as rationalization investments, conversion investments, or diversification investments, depending on the desired changes in the provision of services and the service portfolio.[3]

The most important financing requirements of logistical investments are:

- Inventory and transport
- Purchase, construction, and furnishing of logistics real estate
- Utilization of logistics real estate

If logistical capital spending decisions are being made, investment calculating procedures may help assess the profitability of an investment in, for example, fixed assets. These procedures can either involve static investment calculations (pay-off method, cost comparison method) or dynamic investment calculations (annuity method, internal rate of return method, net present value method). If investments are made in current assets – e.g. to enhance the service level of delivery through increased stock – the effects on the company value need to be calculated. Instruments of the cash flow statement or the discounted cash flow calculation (DCF), for instance, may be used to this end.[4] Yield analyses also needs to be applied to supply chains. A key figure in assessing the effectiveness and analysing

[3] Cf. Thomen and Achleitner (2006), p. 602 et seq.

[4] Cf. Pfohl et al. (2003), p. 12.

the profitability of supply chains is the *return on investment* (ROI) (see case study 11.2). Especially assets in the form of current assets decrease profits as they entail interest expense from capital tie-up. In addition, they also lock up capital which then cannot be used for other purposes. Logistics costs have a bearing on profit margins, too. These are costs such as order processing costs, transport costs, warehousing costs, and inventory costs. The speed of capital turnover is determined by the financing alternatives for the assets needed.

10.1.2 Managing Fixed Assets and Current Assets

Fixed assets comprise all durable assets (goodwill, company value), long-term financial assets (interests or bonds), and tangible assets (properties, buildings, plants and equipment, machinery). Their purpose is to support the on-going business. From a logistical viewpoint, fixed assets mainly include logistics real estate, machinery (high-bay warehouses, packing machines), equipment (conveyors, picking systems) and means of transport (vehicles, ships, planes) (see Sect. 5.4.2).[5] The management of fixed assets aims at the least possible capital tie-up in these tangible assets. This can be achieved, for example, through:

- Efficient utilization of existing fixed assets
- Amortization of assets which are not necessary for business (anymore) or which do not yield the capital costs
- Avoiding an outflow of funds as a result of a purchase

Current assets comprise all items that remain in the company for a short period of time, such as the inventory of finished and semi-finished products, bank balances, or cash balances. The optimization of current assets has its primary aim in reducing stock and (customer) claims so that tied-up capital is freed up. Reducing current assets allows a company to at least partly finance their capital requirements from their own resources. Approaches in reducing current assets include[6]:

- Efficiently structured and improved operational financing processes and money processes
- Integrated business planning in regard to customers, suppliers, financial institutes, and investors
- Goal-oriented collaboration across all departments involved in the value chain

The *working capital* is calculated as current assets minus short-term liabilities from deliveries and services and other (possible) current liabilities. Figure 10.2 shows the working capital as displayed on a company's balance sheet.[7]

[5] Cf. Gomm (2008), S. 106.
[6] Cf. Hofmann (2005), p. 206 et seq.
[7] Cf. Klepzig (2010), p. 18.

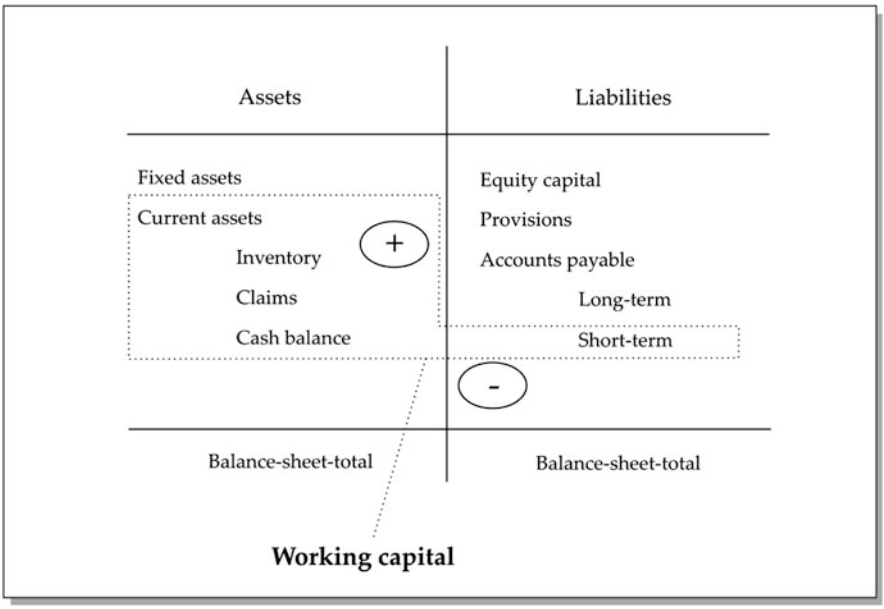

Fig. 10.2 Working capital as shown on the balance sheet (Klepzig (2010), p. 19)

The working capital is the share of current assets which needs to be financed by the interest return on capital. Managing the working capital is of great importance since a company's profitability is greatly influenced by it. *Working capital management* seeks to keep the working capital's portion of locked-up capital as small as possible. The following core processes – which can largely be classified as pertinent to logistical functions – and the measures associated with them may provide considerable help in optimizing working capital[8]:

- *Order-to-cash:* shortening of the timespan between placement of an order and receipt of money. Measures that are applied to this end mainly include optimized financing and payment conditions, i.e. improved and expedited order processing, claims management, and complaints management
- *Total supply chain management:* integration of the different value-added steps into a single integrated and optimized value-added chain by means of shortened cycle times, integration of sales planning, and optimized production and procurement processes

[8] Cf. Klepzig (2010), p. 11 and p. 38 et seq.

- *Purchase-to-Pay:* optimization of the timespan between purchase and payment by means of changes made to financing and payment conditions, through a favourable choice of suppliers, through optimized order processing and audit, through optimizations in the incoming goods department, and by means of liabilities management.

10.1.3 Financial Supply Chain Concept

While supply chain management has so far only been concerned with the optimization of the flows of material, goods, and information (see Sect. 3.2), the concept of financial supply chains also includes cash flows during production and along supply chains. The management activities dealing with cash flows are termed *supply chain finance* or *financial supply chain*.[9]

Examining the flow of financial means allows us to outline the non-monetary service processes of a supply chain from a financial viewpoint. Trade relationships with suppliers and customers usually entail cash flows that are in reverse to the flow of goods. Financial supply chain management aims to[10]

- Increase the transparency of financial flows
- Improve the analysis and planning of cash flows
- Reduce tied-up current assets
- Optimize financial process costs

Furthermore, the number of parties and persons involved increases when examining *financial supply chains*. Traditional supply chains are made up of stakeholders such as suppliers, producers, logistics service providers, customers, and consumers. Financial supply chains, however, may also include internal players such as the financial department and external players such as banks (large banks, direct banks, investment banks), financial service providers (leasing or factoring companies) and investors (credit institutions, insurance companies, enterprises, private persons, institutional investors).[11] It is important that all of these players be considered in a supply chain since payment defaults may occur at one stage if delivery has failed at the previous stage. This would have an effect on the financial flows of all stakeholders involved in the supply chain.

Along with the examination and assessment of investments and finance functions, an analysis of the fixed and current assets and of the capital costs should be carried out and cash flows and returns should be tracked. A suitable instrument for this is the *cash-to-cash-cycle* (cash-conversion-cycle, cash-flow cycle, cash-to-

[9] Cf. Skiera and Pfaff (2004), p. 1399; Gomm (2008), p. 58 et seq.
[10] Cf. Brandt (2004), p. 118; also Sarbach (2006), p. 12.
[11] Cf. Hofmann (2005), p. 206 et seq.; Gomm (2008), p. 155 et seq.

cash-cycle-time),[12] which essentially measures the time of capital tie-up. The cash-to-cash-cycle also serves to determine the following figures[13]:

- *Days Payables Outstanding:* the time between the receipt of the supplier's bill until its payment
- *Days in Inventory:* the time during which purchased resources are involved in the production process until they are sold as semi-finished or finished products
- *Days Sales Outstanding:* the time between the product's sale and the receipt of payment from the customer

Figure 10.3 shows an outline of a cash-to-cash-cycle. In this case, raw and process materials as well as semi-finished products are being purchased, followed by the production of commodities and their sale. The timeline displays the corresponding stages of order placement, procurement, supply, and delivery. The elements of the cash-to-cash-cycle take effect after the goods have been supplied and upon receipt of the bill. Payment takes place at a later point. In between are *days in payables*, which indicate the outstanding liabilities. Invoicing is effected

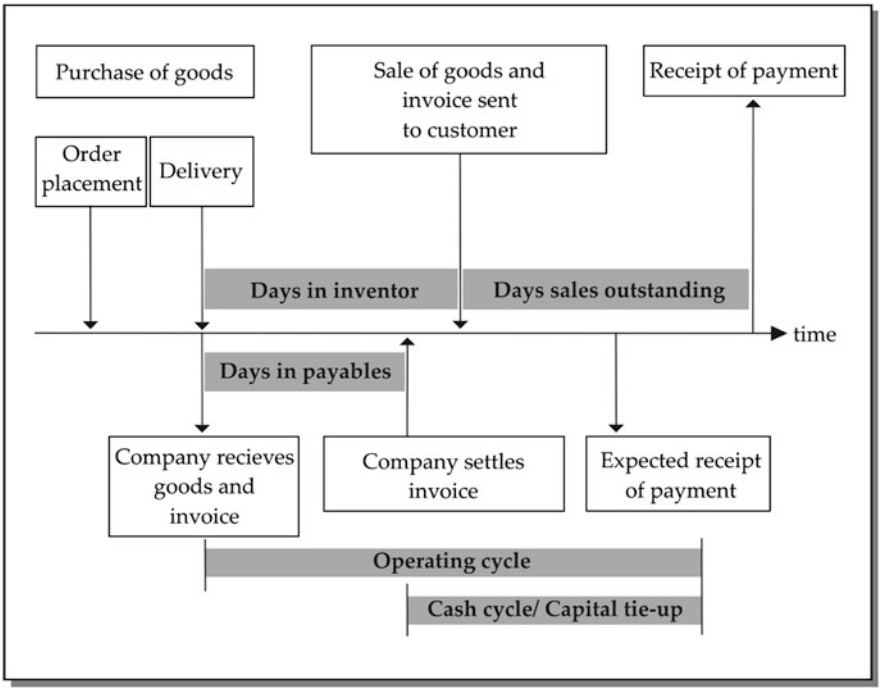

Fig. 10.3 Outline of the cash-conversion-cycle (Brandt (2004), p. 117)

[12] Cf. Pfohl et al. (2003), p. 11.

[13] Cf. Saarbach (2006), p. 29.

upon delivery and the payment due is determined. In between invoicing and the effected payment are the *days in receivables*, indicating the outstanding debts.[14]

The cash-to-cash-cycle is calculated by adding *days in inventory* and *days sales outstanding* minus *days payables outstanding*. Thus, the timespan can be determined within which a company has invested money in a specific business case, i.e. the time during which the current assets are tied-up.[15] For companies it is important to know how long a specific amount of capital cannot be used otherwise so that no additional tie-up of current assets unnecessarily compromises the company's liquidity. This tie-up keeps companies from obtaining financial income which could have been realized using the tied-up capital.

In order to reduce the working capital, *cash-out* activities should be carried out as late as possible while *cash-in* activities should take place as early as possible. Both of these activities are dependent on the way in which the processes that trigger payment are stipulated.[16] On the procurement side this becomes possible if the supplier is to be paid at the latest possible point, which can, for example, be achieved through:

- Supply of high-quality materials only shortly before demand arises
- Passing of ownership of materials from consignment warehouses only shortly before demand arises
- Payment is not effected immediately but only as part of the monthly payment run
- Payment is only effected after assembly of the delivered part or after sale of the finished product

Conversely, cash-in is most beneficial if the customer pays at the earliest possible point, which can, for example, be achieved through:

- Adherence to delivery dates
- Delivery of faultless products that do not give cause for complaint
- More frequent payment runs
- Cash before delivery or delivery against deposit
- Early dunning

The entire supply chain can thus be optimized within the financial supply chain through the optimization of a specific company's internal financing in the sense of a cash-to-cash-cycle. However, this does not mean that each company would strive to shorten their cash-to-cash-cycle. Instead, collaborative solutions need to be found

[14] Cf. Klepzig (2010), S. 46 et seq.
[15] Cf. Gomm (2008), p. 125
[16] Cf. Klepzig (2010), p. 47 et seq.

which shorten the cash-to-cash-cycle of the supply chain as a whole, even though individual companies may not be fully optimized this way. The potential for increased efficiency of the capital tied-up in the supply chain may thus be realized through[17]:

- Optimized cash management by cooperatively maxing out credit lines
- Introducing credit note procedures throughout the supply chain to expedite financial flows
- Improved capital requirement forecasts for all cash flows

10.2 Financing Deliveries of Goods and Inventory

10.2.1 Overdraft Facilities and Supplier's Credit

The financing of raw and process materials as well as of semi-finished and finished goods necessary for production and the transport thereof is called operating resources funding or inventory financing. Inventory financing is usually carried out by granting short-term credit lines in the form of overdraft facilities, supplier's credits, or consumer credits.[18]

By means of a *current account,* banks or financial institutions provide a borrower with funds. The borrower is granted a credit line which constitutes the credit limit. This credit can be used on demand by the borrower. On-going payment transactions repay the amount that has been used of this credit to the bank. Interest is only payable on funds that have actually been used. During its period, the loan can be used up to its limit at any time again.

With regards to inventory financing, we can further distinguish between a committed *inventory credit facility* – where the inventory is assigned to the bank as security – and an uncommitted short-term operating credit, which can be used flexibly. Inventory financing is always shown on the liabilities side of the balance sheet, regardless of its form.

A *supplier's credit* (also called accounts receivable loan) allows for the short-term use of financial means. Upon purchase the supplier grants the buyer a certain time for payment free of interest. Usually, this is a period of grace of 30–90 days or in individual cases even considerably more. A supplier's credit is usually granted informally and without collateral. This type of credit, however, generally constitutes an expensive financing alternative.

Consumer credits in the form of deposits are a type of credit that is used apart from supplier's credits. These credits are especially popular in the capital goods and construction industries. The customer pays pre-agreed instalments of the purchasing price (advance payment, part payment) upon order placement and/or after production.

[17] Cf. Pfohl et al. (2003), p. 47.

[18] Cf. Thommen and Achleitner (2006), p. 556 et seq.

As opposed to supplier's credits, the instalments incurred are paid by the customer. Apart from their financing function, customer credits are advantageous for the supplier in that they increase the likelihood of the good's being accepted by the customer.[19]

10.2.2 Factoring, Forfaiting, Cash Forwarding

Factoring is a so-called credit substitution and constitutes a financial instrument that is to support suppliers in realizing claims towards their customers more quickly. Factoring involves a bank's or a factoring company's (factor) purchase (purchase of receivables) of mostly short-term claims incurred through goods deliveries or services rendered. The bank or factoring company takes on all debts resulting from these deliveries or services. Up to 90 % of the sum receivable may be immediately financed in advance. After collection of the accounts receivable by the factor, the seller of the receivables obtains the remaining 10 % minus a factoring fee charged by the factor. Often times factoring companies are also in charge of the accounting, invoicing, and specifically of dunning. Figure 10.4 illustrates the factoring processes.

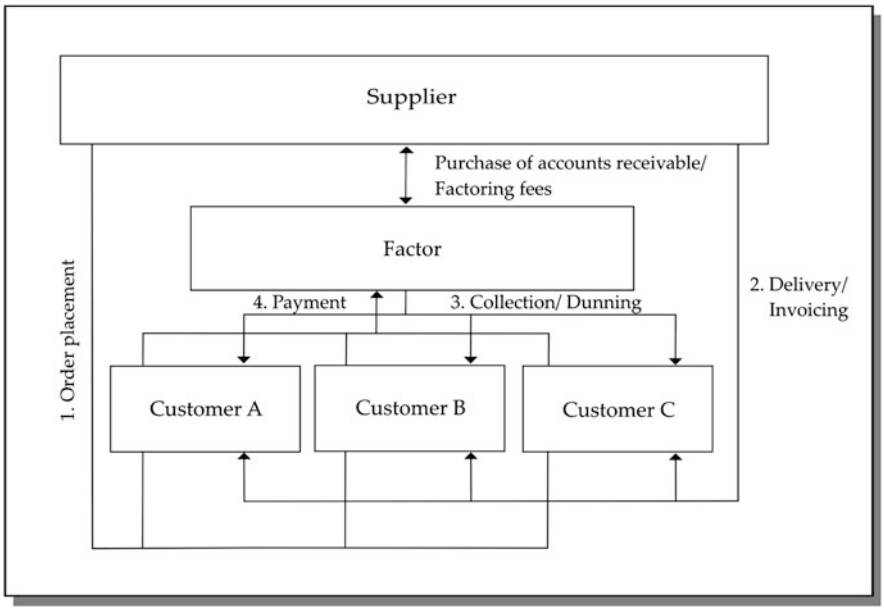

Fig. 10.4 Outline of the processes and functions of factoring (Cf. Thommen and Achleitner (2006), p. 561)

[19] Cf. Becker (2008), p. 171.

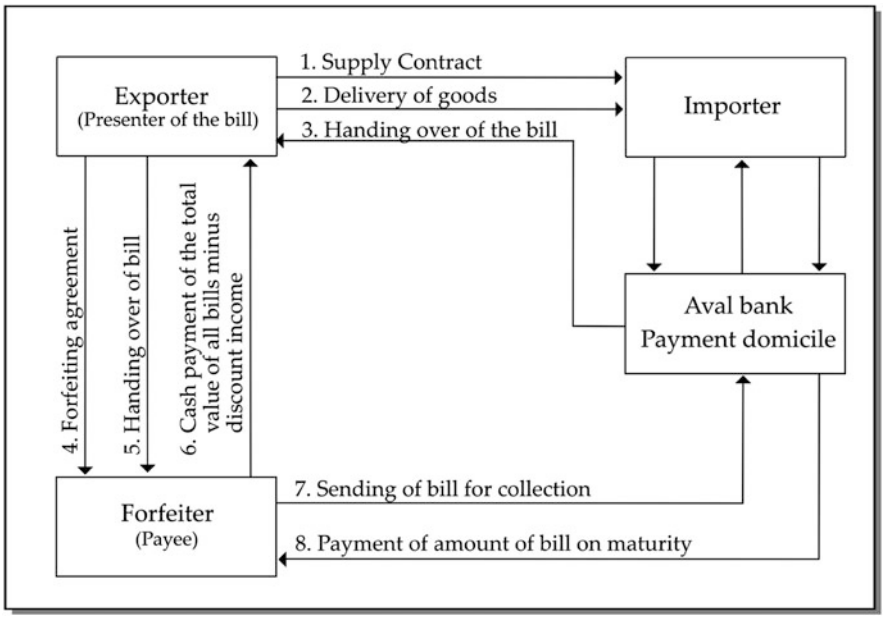

Fig. 10.5 Outline of the processes and functions of forfaiting (Cf. Thommen and Achleitner (2006), p. 564)

Another form of financing tailored to inventory financing is *forfaiting*. This form of financing is mainly employed in medium-term and long-term export financing. It involves the sale of export receivables to a special institution (forfaiter) without recourse. The default risk and foreign exchange risk are borne by the forfaiter. The level of costs is accordingly high. Figure 10.5 shows the processes of forfaiting.

Central to forfaiting are *aval credits* (bills of exchange) which act as suretyship. These are used nationally and internationally if delivery obligations, warranty obligations, and payment obligations need to be backed by collateral security. Mostly, companies obtain these credits from a bank since none of the companies involved (exporter, importer) wants to take the risk associated with advance payments. The forfeiter acts as payee and collector of the receivables from the exporter's delivery. The exporter obtains a bill of exchange from the importer, which is made to the exporter (promissory note).[20] In adition to aval credits, there are *customs guarantees* and *freight guarantees* which do not require collateral securities in cash (warranty guarantee).

[20] Cf. Thommen and Achleitner (2006), p. 563.

Cash forwarding is a variation of factoring. As opposed to conventional factoring, cash forwarding involves an undertaking of 90 % of the invoice amount upon acceptance of the goods from the supplier.[21]

Apart from factoring companies and banks, logistics service providers also offer additional claims management services in collaboration with banks. These may include accounting services, which are offered by debtor companies especially set up for these purposes. Outsourcing these functions to logistics service providers offers more transparency for the acceptance of goods, collection, delivery and invoicing. Service providers such as Deutsche Post World Net (DPWN) offer such services in collaboration with Postbank under the label *Financial Logistic Solutions*. [22]

10.2.3 Inventory Management and Off-Balance Sheet Inventory Financing

It is the primary aim of inventory management to reduce working capital by reducing inventories (see Chap. 7). Inventories essentially comprise raw materials, process materials, and finished goods, which are stored in warehouses as part of a procurement, production, and distribution system of a company (see Sect. 8.3). Reduction of inventory should bring about a reduction of capital costs, which need to be used for the (pre-) financing of inventories. If inventories are to be reduced to lower the capital costs, however, one must consider the risk of decreased delivery capability. Approaches in reducing inventory are[23]:

- Negotiations with supplier to enhance delivery service
- Differentiation of delivery service according to products
- Differentiation of delivery service according to customers and customer profitability

At the same time, inventory cannot be reduced within a supply chain simply by transferring the storage functions to upstream or downstream steps in the value chain, i.e. to suppliers and customers. Instead, it should be the aim to intensify the relationships between suppliers and consumers. This may be effected, for instance, through cross-company approaches in inventory financing, as opposed to companies relying on their individual financing approaches within a value chain. This can potentially result in lower interest costs.

Well-directed *inventory allocation* can result in financial advantages at certain points of the supply chain.[24] This process involves goods being received by the supplier at the latest possible time or delivered to the consumer as early as possible.

[21] Cf. von Eisenhardt-Rothe and Jütte (2003), p. 163.

[22] Cf. von Eisenhardt-Rothe and Jütte (2003), p. 163.

[23] Cf. Pfohl et al. (2003), p. 38 et seq.

[24] Cf. Pfohl et al. (2003), p. 39; Klepzig (2010), p. 129.

A suitable means to reduce inventory through inventory allocation on the supplier's side is to establish a consignment warehouse or to implement vendor-led inventory management (e.g. VMI) (see Sect. 7.5).

Inventory financing can take place both on the supplier's and on the consumer's side. On the respective company's balance sheet, the inventory is shown as part of the working capital and capital tie-up. Inventory financing may also be taken on by logistics service providers. This is particularly sensible if procurement and distribution logistical services are also carried out by service providers. Depending on the level of risk-taking, the logistics service provider may assume ownership of the inventory (authority to disposition) or carry out interim financing (*vendor hub financing)*.[25] A vendor hub is a warehouse managed by a logistics service provider. This includes the management of transfer of ownership from supplier to consumer (see Sect. 7.4.2). Vendor hub financing can utilize factoring.[26] Such concepts, however, require partnership-like concepts within which customers, suppliers, logistics service providers, and financial service providers cooperate to reach the most favourable solutions possible. Usually, this results in the set-up of a new company which takes charge of the balancing of accounts (*off-balance inventory financing*), along with the entire goods management (purchase, logistics, debtor management).

10.3 Financing of Logistics Real Estate

10.3.1 Self Financing and External Financing

Logistics real estate may be provisioned through purchase, rent, or leasing of an existing object or through the building of a new one. If the property is owned by the company, they have the sole right of disposition over it for an unlimited period of time. *Property financing* of logistics real estate can be self-financed or externally financed. Self-financing enables a company to set up the property or sell it at any time without having to make its size, location, and facilities dependent on a bank. This, however, requires the company to be able to finance the property exclusively from their cash flow or from an increase in capital. Moreover, the capital tied up in the property will not be available for other investments. Property financing can be carried out using self-financed equity capital (e.g. accumulated profits), externally financed equity capital (e.g. stocks), or borrowed capital.

A common way of externally financing logistics real estate is *mortgage financing* at a fixed interest rate with annuity amortization.[27] This involves repayment rates which cover the interest payments and the external capital that needs to be paid off. These repayment rates may be linked to business success and thus, for

[25] Cf. Stenzel (2003), p. 145 et seq.

[26] Cf. von Eisenhardt-Rothe and Jütte (2003), p. 168.

[27] Cf. Stenzel (2003), p. 142.

example, to the property's capacity utilization. This way they can follow the cash flow development (*pay as you earn*).[28] This makes it possible to adapt the financing to the peculiarities of a logistical project, as is the case in contract logistics, for example. Banks and credit institutions are lenders for mortgage credits. The financing is collateralized by an encumbrance (mortgage, land charge/annuity land charge) on the property.

For industrial companies and trade companies, *investment* in their own logistics real estate used to be the most common form of provisioning real estate. The actual utilization of the real estate used to be the main reason for this kind of investment, which means that logistics real estate was only rarely purchased for capital investment purposes. Companies still use approximately 50 % of all logistics real estate in Germany for their own logistics.[29] The remaining 50 % of existing real estate are run by logistics service providers. Alternative ways of real estate provisioning are available for logistics service providers. If an existing property with sufficient capacity is owned by the client, the service provider will rent and make use of the real estate for the duration of the contract. Should the contract stipulate that the logistics property needs to be provided by the service provider, the service provider may draw on their own property resources. If these resources do not suffice, the service provider may also provision the real estate within the framework of a (new) project. The basic decision here is whether to buy, rent, or lease the property. Alternatively, a joint venture between the client and the logistics service provider is conceivable.[30]

10.3.2 Rent and Leasing

Rent is to be understood as a landlord's permission for a tenant to use a property (rental object) for the duration of the rental period in exchange for money.[31] Commercial rental contracts – as used for logistics real estate – are usually made for a period of several years. The contractual design criteria include, above all, periods of notice, renewal clauses and rent adjustment clauses. In practice, a variety of rent options have established themselves, as for example *sale and rent back, build and rent,* or *buy and rent*.[32]

Logistics real estate may also be provisioned based on a lease contract (plant leasing). Leasing is a form of tenancy which is 100 % externally financed. Owners, tenants or lessees of the property may be industrial enterprises, trading companies, or logistics service providers. The lessor is a leasing company acting as intermediary. The lessor purchases or builds the property on behalf of the lessee by means of

[28] Cf. Bjelicic and Kostka (2000), p. 167.

[29] Cf. Nehm et al. (2009), p. 46.

[30] Cf. Nehm and Schryver (2007), p. 237 et seq.

[31] Cf. §535 (1) and (2) German commercial code.

[32] Cf. Ockens (2003), p. 206.

a bank loan. It is assumed that the lessor will at least partly earn back the capital expenditure plus interests and profit. The lessee merely has to pay lease instalments. This excludes the lessee's reliance on credit lines and providing of collateral through the company's assets, which may significantly improve a company's rating for other financing transactions.

From a fiscal point of view, it is important in what way *lease contracts* affect the balance sheet and taxation. Depending on whether the investment risk is borne by the lessor or lessee and to whom beneficial ownership is assigned, we can distinguish between operative leasing and finance leasing.[33] In cases of *finance leasing,* the brunt of the risk is borne by the lessee and the leasing item will show on the lessee's balance sheet. All other cases are referred to as *operate leasing*, which means that the lessor will include the item on their balance sheet. Therefore, only operate leasing offers the possibility of off-balance financing and thus of balance-sheet contraction. Regardless of the specifications in the contract, an item cannot be accounted by the lessor if the property is tailored to the lessee's needs (*specialty leasing*) and only the lessee could use it in an economically reasonable way upon expiration of the lease contract. However, most (standard) logistics properties can be used in a variety of ways which is why specialty leasing is not usually carried out.

Depending on the initial situation and the goals of the lessee, we can make a distinction between new-building leasing, buy-and-lease, and *sale-and-lease-back*[34] (see Sect. 7.3.2). Especially the sale-and-lease-back of logistics real estate is an up-to-date option for logistics service providers. It entails the lessor's purchase of an existing property from the lessee in order to subsequently lease it back to the lessee. Since the outsourcing of logistics services to logistics service providers is associated with increasingly shorter contract periods, service providers need to align their capacities more and more with the duration of service agreements. With regard to the provision of logistics real estate, this requires them to rent or lease real estate according to demand and to ideally sell their own real estate in order to subsequently rent or lease it back.[35]

10.4 Financing of Logistics Movables

10.4.1 Internal and External Financing

Logistics movables comprise equipment and chattels of storage and transshipment facilities. This includes conveying technology, racks, packing machines, and other (intralogistical) objects, any kind of vehicle in logistics facilities (industrial trucks),

[33] Cf. Becker (2008), p. 190.
[34] Cf. Feinen (2003), p. 191.
[35] Cf. Stenzel (2003), p. 141; Mahler (2008), p. 40 et seq. and p. 199 et seq.

and every means of transport of the different transport modes in road freight traffic, sea freight traffic, inland waterway traffic, and air freight traffic (see Sect. 4.2). Specifically equipment such as high racks, conveying technology, and picking installations are frequently tailored to the real estate in which they are installed and operated. Despite their building-like character, high racks are therefore not considered real estate but are classified as machine.[36]

The *forms of financing* for logistics movables are largely the same as for logistics real estate (purchase, rent, leasing). However, flexible financing of provisioning and usage are even more important for logistics movables. On the one hand, the employment of the different capacities is dependent on capacity utilization. On the other hand, the service provision for logistic processes and the resulting cost structures greatly depend on the technological standard of the equipment and vehicles used.

Thus, changes to e.g. the IT infrastructure (release changes, cloud computing) or changes of engine (soot filter, hush kits) for vehicles and planes have a significant impact on the economic operating life (investment security). For economic reasons, it is therefore not advisable to finance, for example, vehicles and IT systems from one's own resources.

As with logistics real estate, logistics service providers need to consider the operating life of logistics movables with a view to contract periods. Here, high flexibility when renting or leasing items has to be weighed against increased costs for usage.[37]

10.4.2 Leasing

The *leasing* of mobile capital equipment (equipment leasing) involves the lessor's ordering of goods which had been requested by the lessee. Make, special design options, and supplier are determined by the lessee. Lessee and supplier also agree on a price. Procurement costs and the financing of the leasing item are borne by the lessee.

The distinction between *credit purchase* and leasing is much more difficult to draw for logistics movables than for logistics real estate. This is partly due to the fact that there are numerous mixed forms (hire purchase, externally financed purchase) and partly because the lessee has the option of purchasing the leasing item at a later point. The lease contract may already stipulate this (leasing with purchase option). Depending on the leasing item, such option rights are frequently made use of for logistics movables. This is especially true if the market value of the leasing item is higher upon expiration of the contract than the purchasing price was at the beginning of the contract. Thus, utility vehicles are acquired by the user and used for different purposes, depending on their mileage and distance travelled.

[36] Cf. Mahler (2008), 104.

[37] Cf. Steinmüller (2007), p. 553.

As opposed to hire purchase, leasing involves that – for the term of the contract – the investment good remains the property of the lessor, who also bears the residual value risk. The lessee only pays for the usage of the leasing item and need not include it on the balance sheet (off-balance-sheet treatment). The advantages resulting from this include improved liquidity since no capital is tied up, transparent cost structure (fixed payments), and fiscal advantages (tax-deductible operating costs). In addition, leasing makes it possible to keep abreast of the latest technological developments since switches to new products and technical solutions (e.g. hardware upgrades) may also be implemented during the term of the leasing agreement for a fee (migration fee) and at changed conditions.[38]

(Full) service leasing is an extended form of leasing, where the lessor offers additional services apart from financing. Examples of this are vehicle leasing and fleet leasing, where different services related to vehicles and fleets can be individually combined and offered to the customer. Among these services are[39]:

- Maintenance and repair
- Provision of replacement vehicles
- Payment of vehicle tax, toll charges and other charges
- Accounting of fuel cards and gas station services
- Analysis of gas consumption and other vehicle data
- Offering insurance services
- Handling of claims

Another form of service leasing is *fleet leasing*. With this type of leasing, an entire fleet consisting of several vehicles is the subject-matter of the leasing agreement. Fleet leasing can include services such as the provision of replacement vehicles as well as services related to fleet management. This is due to a trend followed by more and more transport companies – especially from the road freight transport sector – resulting in an outsourcing of their fleet management. Even aircraft fleets and ships can be the object of leasing agreements. This is referred to as *large-scale-project leasing,* for which a leasing company is often especially set up. Such a company only leases the specific object and deals with all procurement and financing processes.

10.4.3 Build-Operate-Transfer Models

Another way to finance fixed and current assets in logistics and supply chains is *build operate transfer*. This is a financing model based on public private partnership that has become very common among private-sector companies for infrastructure projects in the energy sector, waste disposal industry, telecommunications sector, and for airports or road construction.[40] The manufacturer acts as the client of the

[38] Cf. von Eisenhardt-Rothe and Jütte (2003), S. 155 et seq.
[39] Cf. Mangold (2001), S. 223 et seq.
[40] Cf. Donier (2006).

operating company. Investment in production facilities and technological infrastructure is made by the operating company (SPC – Special Purpose Company) which is the owner of the production plant. The operating company is also in charge of designing, building, and operating the plant, including maintenance, replacement investment, and spare parts logistics. Since the investment is non-capitalized on the client's balance sheet (according to the German Code of Commercial Law HGB), the costs associated with the provision of the services vary for the client.

Other stakeholders involved in an SPC are investors, plant manufacturers, project managers, financial service providers, and works managers. The set-up of an operating company constitutes a case of *project financing*, which means that payment is usually effected on availability or upon production (pay on production, pay to production).[41] Minimum order quantities are frequently associated with build operate transfer. This offers the client the advantages of low capital tie-up for stocks and fixed assets as well as prefinancing by the operating company.

Build operate transfer has not only been applied to technical equipment and production plants but has also increasingly become applicable to supply chain management. The aim is to allocate logistic tasks to specialized service providers within the logistics chain. These tasks may include storage, transport, and goods handling as well as the entire inventory management.

Case Study 10.1: Build-Operate-Transfer Models in the Industry

Automobile Industry and Utility Vehicle Industry

Since 2002, parts of the production facilities and conveying technology at the Ford plant in Köln-Niehl have been operated through a build-operate-transfer model by *EISENMANN AG*, Böblingen. These include, amongst other things, the final-assembly line for the models *Fiesta* and *Fusion*. The build-operate-transfer model comprises the operation and maintenance of all conveying systems. Invoicing takes place on the basis of readily assembled cars.

Production at *MMC Smart* in Hambach (see case study 6.3) is based on a build-operate-transfer model which involves numerous suppliers. Due to the low vertical range of manufacture of only 10 % at MMC Smart, system suppliers do not only undertake 90 % of production but they have also borne roughly 50 % of the production plant's investment costs amounting to 400 million Euros.

The painting plant at the utility vehicle production site of *MAN* Latin America is also operated through a build-operate-transfer model by EISENMANN. EISENMANN is in charge of varnishing the driver's cab, which includes full responsibility for the plant and personnel.

Airline industry

A build-operate-transfer model has been realized between *Flughafen München GmbH* and *Lufthansa AG* for Terminal II at Munich airport. Lufthansa AG took on 40 % of the investment costs. In return, the terminal was designed according to Lufthansa's specifications.

[41] Cf. Gomm (2008), p. 246 et seq.

Review Questions

1. Which concepts suitable to finance logistical fixed and current assets do you know?
2. Distinguish between capital costs and capital tie-up and explain how they can be reduced.
3. Explain the concept of Supply Chain Finance.
4. Which stakeholders can provide financing in logistics?
5. Outline the significance of the cash-to-cash-cycle.
6. Assess equity financing and external financing from a financial perspective and with a view to financial risks.
7. Name the differences between factoring and forfaiting.
8. What are the advantages of pay on production?
9. Explain the importance of capital budgeting, using the example of an intralogistical investment.
10. How are build-operate-transfer models different from purchase or leasing?

Additional Literature

Bowersox, J. D., Closs, D. J., & Cooper, M. B. (2012). *Supply chain logistics management*. New York/London: McGraw-Hill.

Buxton, C. (1999). The financial-logistics connection: Supply chain financing. In *Finlistics* (no. 23, 1999).

Feinen, K. (2002). *Das Leasinggeschäft, 4. neubearbeitete Edition*. Frankfurt: Knapp.

Hartley-Urquhart, R. (2006). Managing the financial supply chain. *Supply Chain Management Review, 10*(6), 18–25.

Hofmann, E. (2011). *Supply chain finance solutions: Relevance – propositions – market value*. St. Gallen/London: Springer.

Jacob, D., & Schröter, N. (2009). *Bedeutung von PPP für ein modernes Infrastrukturmanagement im öffentlichen Sektor*. Wiesbaden: Springer.

Palmia, S. (2009). *Financial supply chain*. New York: McGraw-Hill.

Skiera, B., Pfaff, D., & Weiss, J. (2004). *Financial supply chain management*. Bonn: Galileo Press.

Stock, J. R., & Lambert, D. M. (2001). *Strategic logistics management*. Boston: McGraw-Hill.

Timme, S. G., & Williams-Timme, C. (2000). The financial-SCM connection. *Supply Chain Management Review, 4*, 32–43.

Wildemann, H. (2010). *Betreibermodelle: Leitfaden zur Berechnung, Konzeption und Einführung von Betreibermodellen und Pay-on-Production-Konzepten, 9 Edition*. München: TCW.