OECD SME and Entrepreneurship Papers

Secured lending for SMEs: Making effective use of registries and intangibles – a case study approach

This document explores two interrelated aspects of leveraging movable assets to facilitate access to finance: first, the implementation of collateral registries for movable assets, and second, the collateralisation of intangible movable assets. Both dimensions benefit from a case study approach. The report examines how these different instruments function and highlights the opportunities and challenges for making better use of them. It also outlines the role that policies can play in this regard.

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The series provides comparative evidence and analysis on SME and entrepreneurship performance and trends and on a broad range of policy areas, including SME financing, innovation, productivity, skills, internationalisation, and others.

This paper was authorised for publication by Lamia Kamal-Chaoui, Director, Centre for Entrepreneurship, SMEs, Regions and Cities, OECD.

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Many small firms rely on secured lending for their external finance needs

Bank lending represents the main source of external finance for many SMEs across the globe. Often, bank loans are secured, i.e. facilitated by assets. It is common practice that bank loans to SMEs require collateral to be pledged (in which case the ownership of the asset remains with the borrower unless a default takes place) or, alternatively, in the case of asset-based lending, that the underlying asset is owned by the financier.

Secured lending activities rely in turn on collateral registries and a sound legal framework

In both cases, secured lending activities are underpinned by collateral registries (to register the financial interest of the assets as part of a secured lending transaction) and legal frameworks (for example to determine ownership in case of disputes or how to transfer ownership in case of default). Reliable registries and a well-functioning framework allow a broad range of assets to be secured at low costs, and are therefore essential for SME credit markets to flourish.

There are large cross-country differences in how these operate

There are large cross-country differences in terms of legal frameworks and registries, in terms of their scope, comprehensiveness, digital access by third parties, ownership and so on. However, there are a number of good practices which can be applied across different models. A key notion in this respect is "perfection," meaning that the rights of the lender taking the collateral interest will be effective against other parties who might be offered the same assets as security. It requires third parties to be put on notice of the existence of an agreement.

Other important characteristics of well-functioning registries include (1) immutability, meaning that historical records are never deleted or changed, but the current status of an asset remains readily discoverable by referring to the latest documentation; (2) searchability, ideally online and in a user-friendly fashion; and (3) comprehensiveness, referring to the breadth of information that is covered. Finally, the purpose and content of registration may vary by asset and transaction type.

Countries seeking to improve their registries face a number of challenges

While there are clear benefits to improving registries, challenges in getting it right are considerable. For one, enforcement issues, such as when and how to take control of the underlying asset, are challenging in practice. This holds true especially when there are competing claims to the same asset, giving rise to issues of priority. In addition, registries need to take into account the context of the underlying national legal framework, which typically contains layers of legal precedent. For instance, countries with a common law tradition take a different approach than countries with a different legal tradition. Commercial practices also influence the success of a registry, and, as these practices evolve over time, the legal frameworks and registry functions may need to adapt in order to accommodate these changes, for example to keep up with the rising importance of intangibles as an asset class.

Another emerging challenge is how to harness digital technologies, which offer the potential to render registration records more complete and reliable. There exist clear differences in the extent to which these technologies are being used, and in the role of authorised persons versus technology to accurately time-

stamp, amend, and operate the register in a secure manner. Digital ledger technology holds some promise in this area, but have only limited applications in practice to date.

A final consideration is the establishment of specialist registries for specific asset classes, such as movable assets. The creation of specialist registries would make it easier for these assets to be leveraged to secure lending, but may require a different form and legal status than more general registries and lead to a risk of multiple registrations and hence ambiguity. Intangible assets, in particular, pose a challenge in this area.

Intangibles make up an ever larger part of SMEs' assets, but they are especially hard to collateralise

Intangible assets now make up large proportion of corporate value and investment, and this asset class is recognised as an important driver of productivity. At the same time, their use for secured lending transactions remains limited. Nonetheless, there are ways to leverage intangible assets as security, depending on the characteristics of the asset.

In some cases, the market value of the intangible asset is largely independent from the individual or entity which originally created them, which allows securitisation. These assets can be collateralised if there is recoverable value in case of a business failure, and can be redeployed in that event. The paper provides evidence that many patents, contrary to a common belief, can be redeployed in other firms and retain some value, even outside of the accompanying management team.

For many other intangible assets, however, the value of the asset is intimately linked to the business that owns it, and its value cannot be easily transferred to another. In that event, there is still value for lenders in scrutinising the value of intangibles, as the existence of intellectual property and related assets is predictive of better credit performance, and losses are reduced when they are present. Finally, venture debt may be of relevance if the usual criteria for a loan that is otherwise unsecured (i.e. cash flows that demonstrate debt serviceability and a suitable balance sheet) are not met. This is typically the case where a business is pre-revenue or early stage.

Policy interventions can help in overcoming the inherent challenges

While there is potential to leverage intangible assets to secure lending, challenges abound, in particular related to the valuation of these assets. Most lenders are not accustomed to identifying the existence of intangible assets and assessing their value, and specialist appraisers are costly. Moreover, assessing the recoverable value (i.e. the value that can be extracted in case of default of the owner), proves to be particularly difficult, with various valuation methods sometimes leading to very different valuations.

While many countries have developed policies that would enable more assets (including intangibles) to be secured, in particular through credit guarantee schemes, some jurisdictions have gone further and developed specific policies for intangibles assets in secured lending. The paper discusses detailed case studies in this area from Canada, China, Korea, Singapore and the United States.

Policy take-aways

The studies reveal increasing policy interest in supporting the use of intangibles in secured lending activities, especially in light of the growing importance of these assets. While different approaches co-exist, successful interventions (1) address the lack of lender confidence in recoverable intangible value; (2) are structured and delivered in such a way that it can compensate for the absence of capital relief against intangibles under current banking regulations; (3) are deliverable at scale to the companies and sectors which can have the greatest economic impact, i.e. to SMEs, rather than to larger firms; and (4) achieve some economies of scale and scope over the medium to long term. In addition, while, general guarantees are beneficial to the market, it is preferable to supplement them with more targeted measures which (1) address the lender confidence issue and make them more familiar with good practices; (2) address liquidity relief issues; (3) reach sufficient scale to drive down costs, for example related to the valuation of the assets; and (4) avoid over-reliance on regulation as the driver of change.

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Introduction

Information asymmetries, legal uncertainties and inadequate financial skills of small business owners and entrepreneurs constitute long-standing barriers for access to credit for SMEs. As a result, banks often require some form of security or collateral to engage in a credit relationship with a business client, with a long-standing preference for fixed, immovable assets such as real estate.

Despite evidence of looser collateral requirements in recent years in some countries (OECD, 2020[1]), many SMEs continue to struggle to provide the types of tangible fixed assets, such as land or a building, that remain banks' preference as collateral to secure business and commercial loans. The shift towards movable assets, evident from changes to company balance sheet composition, compounds this issue. Immovable assets are now less important to most businesses than movables, such as machinery and equipment, financial assets, receivables and intangible assets[1] (Ramalho et al., 2018[2]), which are harder to collateralise.

The disconnect between collateral that is "available" and collateral that is "acceptable" is important because secured lending is recognised as an important means of overcoming barriers to finance. Where the value associated with an asset that a business owns or needs to acquire can be harnessed, firm value increases, as secured debt facilitates investment in profitable projects that would not be undertaken without it (Stulz and Johnson, 1985[3]). Generally, strong secured transaction laws and registries are associated with better access to credit (World Bank Group, 2017[4]).

In this paper, two interrelated aspects of leveraging movable assets to facilitate access to finance are investigated: (1) the implementation of collateral registries for movable assets, building on good practices, and (2) the collateralisation of intangible movable assets, which is of particular relevance for innovative SMEs. Both dimensions benefit from a case study approach, as further highlighted below.

Collateral registries are publicly available databases of interest in or ownership of assets that record the potential existence of security interest in a movable asset (Ramalho et al., 2018[2]). The introduction of such registries can lead to a lower interest rate and longer maturities as well as expand the number of borrowers (Love, Martinez Pería and Singh, 2016[5]). Hence, registries are essential to broaden credit access for SMEs. At the same time, they cannot be designed in a vacuum, and cannot be entirely "static"; they have to be compatible with underlying legal frameworks, which may themselves be subject to change as markets develop. A well-functioning ecosystem enables a broad class of assets, crucially including movables, to be effectively used as collateral to obtain loans.

This analysis links to the work on Effective Approaches to Implementing the G20/OECD High-Level Principles on SME Financing. The Principles refer explicitly to the importance of reliable credit information to underpin lending activities and the feasibility of expanding the use of intangibles as collateral. The current study also highlights the design of digital collateral registers as an effective way to foster secured lending by increasing clarity on the existence of security rights on assets to creditors, purchasers and the general public (Koreen, Laboul and Smaini, 2018[6]). It also builds on work conducted by the G20 Global Partnership for Financial Inclusion (GPFI) on Credit Infrastructure country assessments, with a deeper look at the OECD countries' characteristics and policy cases.

[1] Intangible assets include intellectual property rights and trade secrets, contractual assets and a wide range of other resources, typically generated within the company that owns them.

There are a number of well-documented difficulties in collateralising intangible assets, which can be summarised under two headings, as set out in previous OECD research (Brassell and Boschmans, 2019[7]). First, there is no standardised valuation method for intangible assets that inspires lender confidence in a realisable value for them; the valuation can fluctuate considerably over time and is especially uncertain if the owner of the assets becomes distressed. Second, transaction costs are typically high, owing to the limited scale of current activities and asset heterogeneity.

These challenges have triggered policy interventions, such as the establishment of specific guarantee and insurance products, or tailored support and/or incentives to financial institutions providing loans backed by intangible assets. This paper builds on previous research by examining a number of case study examples and extracting emerging best practice from them.

This paper seeks to draw policy implications that can help foster better access to traditional bank financing for SMEs, which remains a crucial source of finance for most small businesses. In line with the G20/OECD High-Level Principles, it also highlights enabling structures (such as legal frameworks) which may encourage the development of other sources of finance.

In doing so, the paper presents case studies from countries that have introduced policies in the areas of (1) new legal and regulatory frameworks, including registries, designed to encourage and support secured lending operations and (2) steps to encourage collateralisation of intangible assets. The studies aim to shed light on the effectiveness of these approaches, highlight the key challenges encountered, and provide insights to countries that are considering adopting measures to support wider use of more varieties of collateral.

The paper is structured as follows. Chapter 1 provides an introduction to secured lending, including types of collateral and financial instruments, as well as an overview of providers of secured lending and legal aspects. Chapter 2 presents a synthesis of the case studies investigated on collateral registries for movable assets. Chapter 3 examines the potential of collateralising intangible assets to enhance SME access to finance, while Chapter 4 provides the outcomes of the case studies collected on the collateralisation of intangible assets. Chapter 5 highlights cross-cutting policy implications and lessons learned and presents “take-aways” for policy makers.

1. An introduction to secured lending

Secured vs. unsecured lending

The term “secured lending” describes the use of movable or immovable asset value to facilitate access to finance. Within secured lending, there are two distinct approaches. The first entails the use of assets as collateral. The assets continue to be owned by the borrower, but may be forfeited in the event of default; the value of the assets pledged as collateral feeds into an evaluation of repayment prospects (Berger and Udell, 2006[8]). The second, asset-based finance, means that the ownership interest in the asset stays with, or is assigned to, the financier, at least until the debt associated with it has been satisfied; it comes in a number of forms, some of the most popular of which are summarised below.

In many cases, a further attraction of secured lending (in either form) is that under international rules directed at ensuring financier capital adequacy, the expected realisable value of the secured asset(s) can be taken into account in determining the amount of regulatory capital the lender needs to hold in relation to the loan. In this way, the availability of security makes finance more affordable for the SME (and/or more profitable for the lender).

Both forms of secured lending typically require a financial interest to be recorded. The nature of this interest varies by finance type and territory, but typically takes the form of a mortgage, pledge, lien or fixed or floating charge. The differences between these interests are explored further in Chapter 2.

Secured lending can be contrasted with unsecured lending. This typically bases credit decisions on the quality of the corporate balance sheet and the level of confidence in future projected cash-flows, without relying on the purchase price or potential liquidation value of any particular asset. Typically, this form of uncollateralised lending requires a track record; it is sometimes characterised as “relationship lending”, since it builds on longer-term knowledge of a business as well as so-called soft information gathered throughout this relationship, for example on the quality of the management.

Secured lending, and more specifically strong secured transaction laws and registries, are associated with better access to credit (World Bank Group, 2017[4]). Moreover, the availability of secured debt is associated with an increase in firm value, as it facilitates the investment in profitable projects that would not be undertaken in its absence (Stulz and Johnson, 1985[3]).

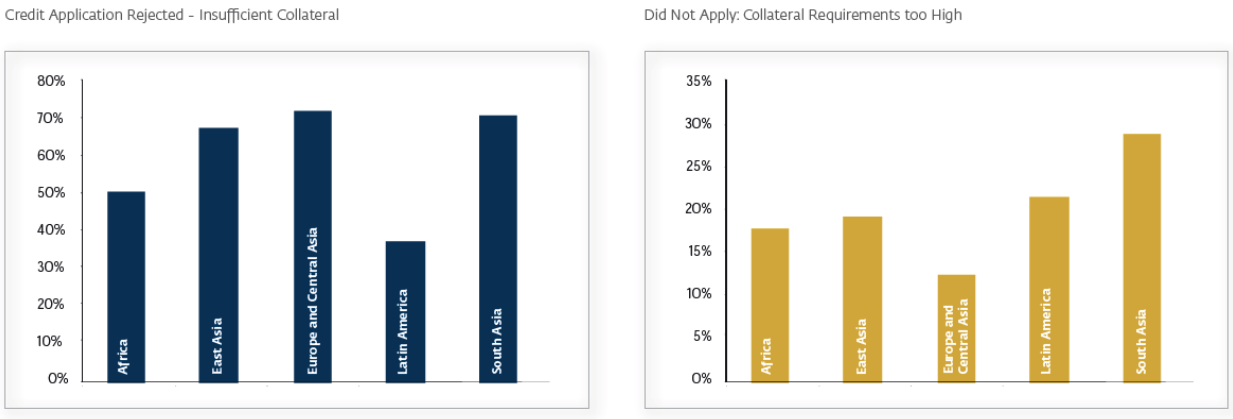
Unsecured lending often proves hard to access for smaller businesses, especially start-ups and young firms which lack a track record of trading and an established credit relationship, and which are relatively opaque when it comes to financial statements and other hard information that could underpin a credit decision. Recognising this, some national schemes exist to encourage the provision of loans to start-ups, but these are generally limited in value.

Empirical evidence shows that banks increase their engagement in collateralised lending relative to unsecured lending when exposed to higher regulatory capital requirements, as collateralised loans are associated with lower risk weights. This effect is particularly pronounced in what is perceived to be higher quality collateral, such as real estate, compared with lower quality collateral such as movable assets, due to differences in their risk weighting (Degryse, Karapetyan and Karmakar, 2018[9]). Increased risk weightings reflect an expectation that losses given default will be higher.

The role played by collateral in SME credit

The need for collateral support reflects the fact that collateral requirements are common in bank lending, although data limitations restrict international comparisons. Financial institutions are often hesitant to provide credit without any collateral, even at high interest rates. In the United States, for instance, nine in ten loans for an amount of below USD 100 000 required collateral of some kind in 2013 (Wiersch and Shane, 2013[10]). World Bank surveys indicate that, as well as lack of collateral being a common reason for the refusal of credit, the requirements for it are a common reason why companies are discouraged from making applications at all ((Wilson et al., 2019[11]), Figure 1.1).

Figure 1.1. Reasons firms are not able to obtain credit



Source: World Bank Enterprise Surveys Global Database, in (Wilson et al., 2019[11])

In addition to the regulatory relief point already referenced, the reasons for collateralising a loan are typically threefold. First, taking collateral provides the lender with a means to recover value from the resale of an asset. In doing so, it offers the bank the prospect of a reduced loss in the event of loan default (and it also incentivises the borrower to resist default if possible, so as not to lose something of value). The long-standing preference among banks for fixed assets as collateral (especially immovable ones) arises from the fact they are perceived as relatively easy to value and pledge, hard to misuse, destroy or steal, and traded on a relatively liquid market.

Second, pledging collateral can address the adverse selection issues commonly encountered in the context of unsecured lending. With the provision of collateral, borrowers, in particular opaque and small SMEs, can signal their credit quality in terms that the lender will understand. As a result, collateral is often required for riskier businesses and exposures. For example, a study of SME loans originated by Irish banks between December 2011 and December 2015 shows that observably riskier firms – according to the banks' internal credit rating - are more likely to be required to pledge collateral (Carroll and McCann, 2017[12]).

Third, the collateralisation of loans can address moral hazard issues and reduce associated cost of screening and monitoring during the credit exposure in order to investigate any unobservable actions that affect the success of the project (Boot, Thakor and Udell, 1991[13])[2].

Given the central role of collateral in the credit decision, many countries have developed policies in this area. The tools most often used to improve SME access to bank finance are guarantee schemes, present

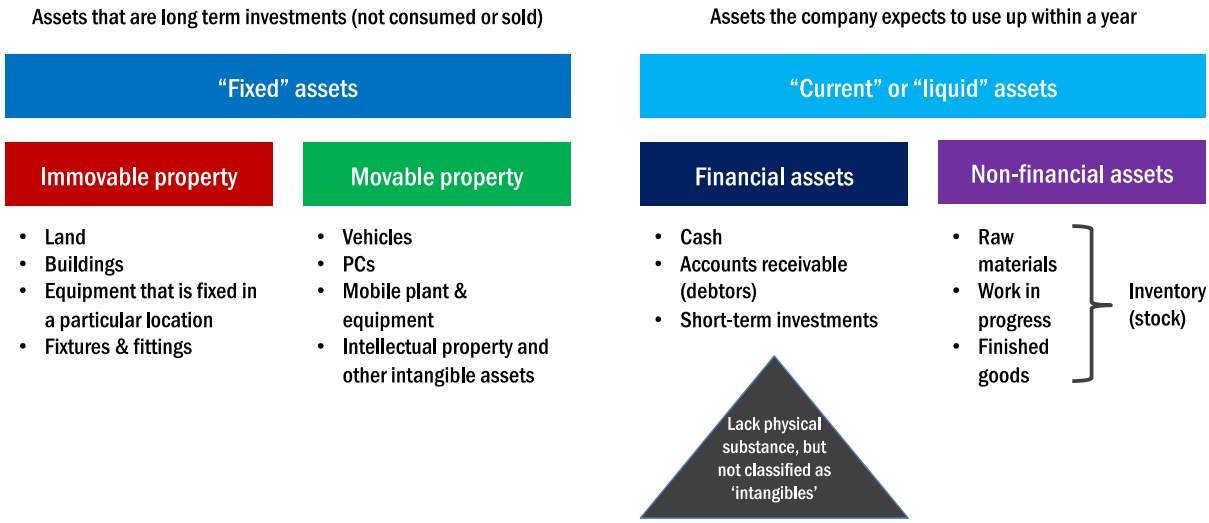
[2] However, an analysis of distressed loans to French SME shows that collateral contributes to reduce the loan loss in the event of default, but does not solve for adverse selection and moral hazard (Blazy and Weill, 2013[72]).

in 23 of 25 countries completing a recent OECD survey. Guarantees are often targeted specifically at companies lacking collateral, which are often associated with segments of particular policy interest, such as innovative and growth-oriented SMEs. Guarantees entail risk sharing, principally with banks; in a few cases, they take the form of risk-sharing instruments such as cover for first losses. 14 countries responding to the survey have gone further and securitised these loans (Koreen, Laboul and Smaini, 2018[6]).

Immovable vs. movable assets

Despite evidence of looser collateral requirements in recent years in some countries (OECD, 2020[1]), banks often ask in particular for fixed assets as collateral, such as real estate, land and other immovable property (for an overview of different types of assets that may be present on a company's balance sheet (see Figure 1.2). The reasons for this emerge from their long life as well as ease of identification, factors that allow for leaner underwriting processes, contracts and monitoring mechanisms (Berger and Udell, 2006[8]). In addition, lenders have built up considerable experience in lending against these assets and can therefore draw on detailed insights into their default and recovery rates.

Figure 1.2. Typical balance sheet treatment of assets



Source: Authors.

Research shows that collateral requirements often rank high among obstacles SME managers and entrepreneurs face when accessing straight debt across a wide range of countries. Many SMEs struggle to provide immovable assets. Furthermore, changes in business practice (for example, increasing focus on provision of services; reducing importance on physical location; development of digital infrastructure, enabling widespread IT outsourcing) mean that the need for companies of all sizes to acquire and own these traditionally favoured types of collateral is decreasing.

By contrast, many SMEs own movable assets, and there are active markets in financing the acquisition of certain categories of movables such as vehicles, mobile plant and equipment, and other types of technology. In developing economies, 78% of firms' capital stock comprises movable assets, and this percentage is even higher for smaller firms (Ramalho et al., 2018[2]).

Some current or liquid assets which are on-balance sheet are also considered to be movable. These include money such as cash and short-term bank deposits, negotiable instruments such as cheques or

bills of exchange, and negotiable documents such as bills of lading, which play an important role in trade finance.

It is important to note that not all movable assets owned by a business are necessarily shown on a company's balance sheet. These include non-physical, non-monetary but identifiable movable assets such as intellectual property (IP) rights (principally patents, trademarks, designs and copyrights). They also include a range of other assets, some of which are subject to separate legal protection in various territories (for example, trade secrets and database rights) and some of which are not covered by specific legislation (such as customer lists). While attention is often focused on the importance of IP rights, especially patents, for start-ups, high growth enterprises and innovative enterprises, this wider set of intangibles is also relevant for value generation. However, both are challenging to collateralise (Brassell and Boschmans, 2019[7]).

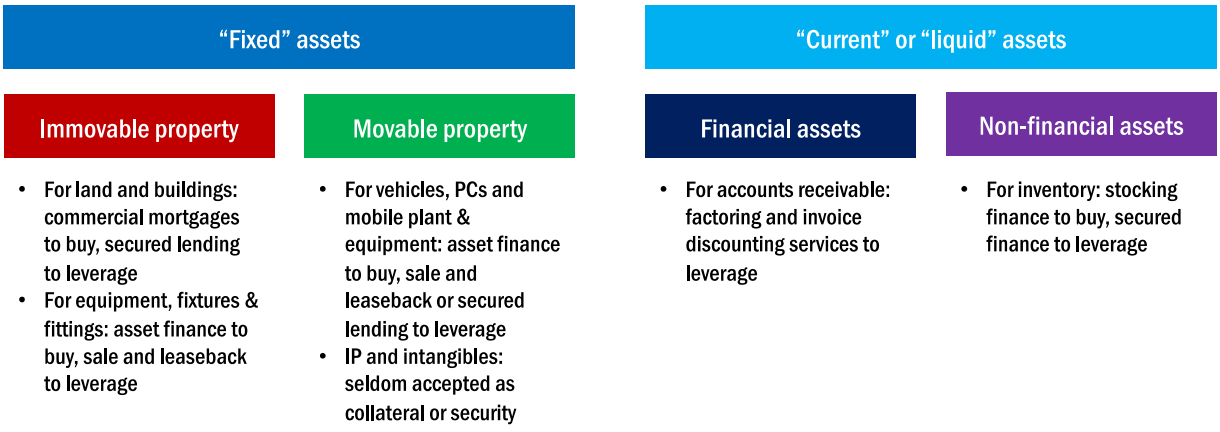
Chapter 4 of this report contains case studies of public and private initiatives to harness IP and intangible asset value. Like other forms of collateral, IP and intangibles can be utilised to provide an indication of the quality of an enterprise, tap into directly generated cash flow through royalty payments stemming from the IP, or increase the value of inventory or consumer goods that could be pledged as collateral. These may be more valuable to a finance provider if covered and standardised by a patent or trademark (Wilson et al., 2019[11]).

Digitalisation is one of the trends that may blur the distinction between tangible and intangible assets. For example, negotiable instruments in electronic form as well as cash in electronic form may be considered intangible current assets. Also, the classification of acquisition security rights strongly depends on the underlying asset, i.e. whether it is a security right in a tangible asset or in an intangible asset as IP determines its status of tangibility (United Nations, 2016[14]).

Financial instruments associated with different types of collateral

Figure 1.3 depicts the different financial instruments that are most commonly used for secured lending transactions, and the different asset classed involved, with a short description below.

Figure 1.3. The use of collateral in finance – types of collateral and financial instruments



Source: Authors.

Asset-based lending, in its various forms, is applicable across a range of "fixed" asset types (see Figure 1.3). It can be used to leverage the value of assets a company already owns, or to acquire new assets. Its

advantage is that it focuses largely or solely on the value of an underlying asset, rather than on the creditworthiness of the firm. It is associated with more flexible terms and conditions than conventional secured lending, often allowing for revolving funds (OECD, 2015[15]). As (Wilson et al., 2019[11]) indicate, "the quintessential credit product enabled by secured transactions reforms is asset-based lending (ABL)".

Where an asset is purchased new, its entire cost may be financed and repaid over a set period (or repayments may be made based on anticipated asset depreciation, depending on the type of asset finance employed). Where an asset is already owned by a business, its anticipated liquidation value generally determines the amount of financing provided by the lender. Box 1.1 provides further insights in the difference between asset-based lending (whereby the financier is the owner of the asset) and collateralised lending (where this is not the case).

Box 1.1. Asset-based lending vs. collateralised lending

Asset-based lending has several characteristics that facilitate its use. First, where an asset is freely available on an open market, its price is simple to determine and non-contentious. The buying power exercisable by a financier may also enable this price to be reduced, creating an additional benefit which may be wholly or partially retained by the lender (whether via margin improvement or risk mitigation; the greater the supply of the asset, the larger this benefit is likely to be).

Second, where there is a market for new tangible assets, there will generally be a secondary market as well, provided that the use to which an asset has been put has not impaired its utility to future buyers (one of the reasons why incorporating maintenance within a financing agreement may be desirable). Provided that these resale markets are reasonably transparent, it becomes possible for a financier to predict a future minimum used value for a new asset with a high degree of confidence.

Combined with a requirement for an insurance policy to safeguard against damage or destruction of the asset, this characteristic has enabled asset financiers to exercise creativity in the products they offer. For example, a business (or an individual) may only need to finance the expected reduction in value of an asset owing to use and the passage of time (technically, the asset depreciation) and defer a decision regarding whether to acquire legal title to the asset until this primary lending period finishes. This reduces the sum to be borrowed and therefore increases affordability.

Collateralised lending, by contrast, generally focuses on the value of assets that a company already owns. Any transfer of title to an asset used as security for a collateralised loan is conditional on one or more events, usually, a default on the loan to which the collateral relates. Its structure is therefore different from, for example, a commercial mortgage, where title is retained by the financier until a debt against a building is fully satisfied (and the agreement contains a right, and an expectation, that the title will transfer to the borrower at that point), and the borrower can only benefit from any appreciation in property value by repaying the lender.

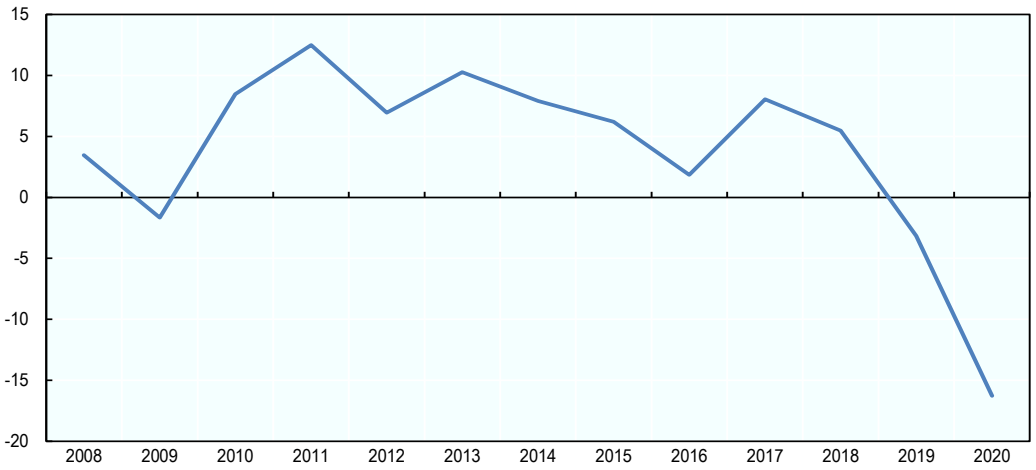
The World Bank estimates that in the United States, movable assets (equipment, inventory and receivables) account for around 60% of enterprise capital stocks and around 70% of small business lending. However it also notes that these movable assets are often treated as secondary collateral to signal and secure the commitment of the grantor, with the principal collateral being related to immovables; further, the amount that can be borrowed will be determined by the value of the immovables or the borrower's revenue-generating capacity

For "current" assets that are financial in nature, receivable purchase instruments such as factoring, invoice discounting and other forms of payables financing are increasingly important to supply chain finance tools. These build on the underlying trade deal value to directly access cash (OECD, forthcoming[16]). The use of

factoring, as one example, has increased since 2010 but start registering a decline in 2019 and a further drop in 2020. In 2018, factoring showed a median growth of 5%, but declined by 3% in 2019 and 16% in 2020 (OECD, 2022[17]) The picture is, however, mixed; volumes declined significantly in Canada, Switzerland and Turkey in 2018, while at the same time, growth rates for example in Korea nearly doubled (see Figure 1.4).

Figure 1.4. Factoring growth rates by Scoreboard median

Year-on-year growth, as percentage



Source: Factors Chain International (2019) in (OECD, 2022[17])

Where current assets are non-financial in nature, inventory or stocking finance is commonly used. This is of particular importance in industries where high value goods or materials need to be sourced and held in stock, potentially over an extended period. This form of finance is typically structured as a revolving line of credit or a short-term loan, with the underlying products serving as security for the loan.

Another formalised method of financing inventory is warehouse receipts (WHR) finance (see (Global Supply Chain Finance Forum, 2016[18]) for synonyms). This asset-based financing mechanism allows enterprises to deposit commodities at a warehouse against a receipt that certifies it is in possession of a specified quantity of a commodity that meets specified standards. The receipt can then be used as collateral for a loan. The finance provider receives ownership of the inventory for the duration of the loan (OECD, 2015[15]).

Several other traditional trade finance instruments may also be applicable, including letters of credit, supply chain finance tools that work as advance based mechanisms such as loans against receivables, and pre-shipment finance that relies on negotiable instruments such as letters of credit, distributor finance or loans against inventory , (Global Supply Chain Finance Forum, 2016[18]).

Movable assets are hard to collateralise

Traditional financial institutions have historically been reluctant to engage in secured lending that is collateralised with movable fixed assets, as characterised above. In general, use of movable assets is more problematic from these institutions' perspective as they are perceived to depreciate more rapidly; they can also be hidden, destroyed or transferred without permission. Also, beyond these operational risk-

related challenges, the collateralisation of movable assets is associated with a higher regulatory capital burden under the Basel III framework.

Movable intangible assets represent particular challenges for SMEs seeking to offer them as collateral. As well as a proven link between intangible assets and growth, there is growing evidence that knowledge of the value of particular assets such as IP rights can assist a financial institution in making a credit decision. However, lenders are accustomed to attributing no value to them, due in part to their regulatory capital treatment. Attempts to remedy this situation are hampered by uncertainties over realisable value and elevated transaction costs (Brassell and Boschmans, 2019[7]).

Policy interventions directed at financial institutions may need to take into account the requirement to build capacity and provide training in order to connect best practice legal frameworks for movable collateral with benefits for access to finance for SMEs (Wilson et al., 2019[11]).

However, financial institutions do engage in asset-based lending, particularly in the concentrated trade finance market, where 13 banks are estimated to provide about 90% of the global traditional bank-intermediated trade finance market (International Chamber of Commerce (ICC), 2018[19]). More and more, traditional banks are forming consortia, sometimes with Fintech companies, in order to reduce inefficiencies in areas such as receivables financing and letters of credit. For example, the blockchain-based platform Contour was founded by banks including BNP Paribas, HSBC, ING, NatWest, SEB and Standard Chartered together with implementation partners as Bain and R3 in order to facilitate digital letters of credit ((OECD, 2021[20])).

In addition, non-bank financial institutions (NBFI) play an increasingly important role in asset-based lending, such as loans against receivables or inventory finance, where these actors lend money against pledged movable collateral as receivables or inventory (Wilson et al., 2019[11]). The Trade Finance Market platform in Singapore, for example, offers receivables and invoice finance instruments. The platform connects SMEs with non-bank investors. Moreover, it performs blockchain-based invoice checks and warehouse receipts checks to ensure that the transaction or collateral is not submitted twice (Trade Finance Market, 2020[21]).

Commercial financial institutions may fund receivables and provide other solutions such as leasing as part of a portfolio. There are also dedicated NBFIs acting as factoring or leasing companies that exclusively focus on one specific type of receivable purchase finance. Additionally, development actors play a role in leasing; for example, policy makers can incentivise leasing providers to disburse new leasing volumes to SMEs as the European Investment Fund (EIF) or the Nordic Development Bank (NDB) (OECD, 2015[15]) .

The policy dimension to stimulating secured and collateralised lending

As noted above, guarantee schemes are a well-established policy measure to address the issue that many businesses lacking appropriate assets to collateralise. This paper explores complementary policy avenues to foster secured lending, especially for movable and intangible assets that could potentially act as collateral, but are seldom used as such in practice.

Lender concerns about harnessing movables and intangibles are not without foundation. In many emerging markets in particular, there are challenges associated with collateral registration, enforcement and the judicial collection mechanism that undermine banks' ability to recover assets from SMEs (Dias Duarte, Matias Gama and Paulo Esperança, 2017[22]).

There is a potential tension between making security interests as easy as possible to enforce, and building in appropriate safeguards to prevent viable businesses being forced prematurely into administration/liquidation. However, the key challenges arise mainly from legal systems that do not accommodate, or keep pace with, desirable commercial practice. Specifically, legal systems for movable

and intangible assets may: (1) limit the scope of movable assets that can be pledged as collateral, (2) lack a centralised registration system to record claims and ensure no other party has the rights to the same collateral, and (3) undermine enforcement of claims in the event of default by requesting the processing through courts. Evidence suggests that these variances significantly affect access to finance for enterprises (Calomiris et al., 2017[23]).

Reforms may be needed to address these challenges and improve access to finance based on movable and intangible collateral. An example of a framework that has been reformed is the United States' Article 9 on "Secured Transactions" of the Uniform Commercial Code (UCC), which allows filings on many assets including account receivables and inventory. An electronic registration system is provided, which temporarily defines lien filings. The UCC filing serves as public documentation that enables potential future lenders and creditors to understand whether a certain movable collateral is already subject to a lien (OECD, 2015[15]). The UCC, in turn, forms the basis for the UNICITRAL Model Law on Secured Transactions, examined in Chapter 2.

Many countries have implemented enabling legal and regulatory frameworks to encourage financial inclusion, for example by permitting Fintech solutions to operate (in 27 out of 38 survey respondents), or more generally to improve data transparency (also addressed by Principle 6 of the OECD/G20 High Level Principles). In many cases this has been facilitated by improving access to relevant business data, including registers of financial interests, to streamline and accelerate the registration process. In most instances, this has been done through digitalisation, with at least some information generally being available free of charge. However, only three countries surveyed by OECD had taken specific steps to facilitate the use of non-fixed and intangible assets (Koreen, Laboul and Smaini, 2018[6]) .

Many countries and their SMEs stand to benefit if best practices can be implemented. This paper therefore adopts a case study-led approach in order to illustrate and examine existing best practice in two specific and related areas.

First, it examines lessons learned through the implementation of registration systems for security interests in selected types of movable collateral. While the benefits of registration are widely acknowledged, the specific challenges in ensuring that the supporting legal framework enables registries to operate efficiently are not well documented, and this study endeavours to partially fill that knowledge gap.

Second, it builds on previous OECD work (Brassell and Boschmans, 2019[7]) to assess how intangibles - the class of movable asset that is most prevalent, yet most difficult to leverage – have been financed through public and private sector initiatives.

2. Collateral registries and legal frameworks for movable collateral

There are pronounced cross-country differences in terms of collateral registries and legal frameworks

Collateral registries are publicly accessible databases of interest in or ownership of assets that record the potential existence of a security interest in a movable asset (Ramalho et al., 2018[2]). The introduction of such registries can lead to lower interest rates and longer maturities as well as expand the number of borrowers (Love, Martinez Pería and Singh, 2016[5]). Hence, registries are essential to broaden credit access for SMEs. A well-functioning framework enables a broad class of assets, crucially including movables and intangibles, to be used as collateral to obtain loans in an effective manner.

Disparities among countries are apparent when looking at Secured Transactions and Collateral Registry (STCR) assessments. In 2017, 77% of high income countries reported having basic scoping features of the STCR framework, compared with 44% of other countries[3] (World Bank Group, 2017[4]). There are also differences in the comprehensiveness and scope of credit registries when they are in place; while some of these variations are being addressed by reforms, indicated by an improvement in score from 6.84 to 7.19 (plus 5.1%), the World Bank's assessment is that the majority of G20 countries still would benefit from substantial reforms of their legal and institutional frameworks for secured lending to bring them to best-practice levels (World Bank Group, 2019[24]).

In addition, many countries have opportunities to embrace digital platforms which could potentially enable more SMEs to obtain secured credit, particularly to promote movable asset based lending (World Bank Group, 2017[4]). There are also new technological developments that permit the use of distributed ledgers with associated security and data integrity benefits which could have a part to play (World Bank Group, 2020[25]).

The scope of this chapter concerns the use of collateral by businesses (principally, SMEs) rather than individuals or households. It focuses on facilitating the use of non-financial assets which are movable and/or intangible, since this is where registries have a particularly important enabling role to play; however, much of the following is also applicable to assets that are financial in nature, such as receivables.

[3] The survey is based on five key pillars critical for understanding the extent to which secured transactions frameworks meet international standards of best practice, including (1) Scope and Creation, e.g. whether future movable assets can be secured, (2) Third-Party Effectiveness and Priority, e.g. whether the law permits registering a notice of the security interest in the registry, (3) Registration and Priority of Liens, which refers to the rights of lienholders such as tax authorities, judgement creditors, (4) Enforcement, e.g. if the law allows for out-of-court enforcement, (5) Registration and Registry , e.g. the existence of an unified, electronic registry for security interests in all types of movable assets for both individual and legal entity grantors (World Bank Group, 2019[24]).

The chapter first sets out the approaches considered to represent best practice in respect of collateral registration, briefly examining how practices may vary depending on asset and transaction type. It then sets out seven challenges which are illustrated with selected case study examples.

Collateral registries: key challenges

Reference points for best practice

For the purposes of this study, it is assumed that best practice documentation is represented by the UNCITRAL Model Law on Secured Transactions and the World Bank Group publications (or their national precedents and equivalents). The UNCITRAL Model Law itself builds on many aspects of the regime in the United States which is centred on Article 9 of the country's Uniform Commercial Code (UCC), and represents a comprehensive approach to the treatment of collateral (see Box 2.1).

Box 2.1. A spotlight on UNCITRAL Model Law on Secured Transactions

UNCITRAL (The United Nations Commission on International Trade Law) has created a range of resources to assist the adoption of consistent commercial and legal frameworks that facilitate the use of various types of asset as security. The principal resource is the Model Law on Secured Transactions, adopted in 2016, and subsequently supplemented with two guides: a Guide to Enactment (2017) and a Practice Guide (2019). Prior to the introduction of the Model Law, UNICITRAL also produced a number of Legislative Guides on Secured Transactions (2007), on Security Rights in Intellectual Property (2010) and on the Implementation of a Security Rights Registry (2013).

As noted in this chapter, secured financing is subject to a multiplicity of regimes around the world which create gaps in lender protection and inconsistences of approach. The primary reason for undertaking the development of the Model Law is to establish a unitary approach that applies one concept for all types of security interest, covering all transaction and asset types, The objective of the Model Law and accompanying Guides is to increase transparency and certainty in transactional activity, especially where this crosses borders, and thereby increase access to credit at more affordable rates.

According to the UNCITRAL website, three States have adopted legislation which is based on or influenced by the Model Law on Secured Transactions (Fiji, Nigeria and Zimbabwe), and a further five countries feature legislation which takes a similar approach to secured transactions (Australia, Colombia, New Zealand, Papua New Guinea and the Philippines) (UNCITRAL, 2020[26]).

The Model Law includes a set of model provisions for registries to deal with the registration of security interests in a publicly accessible registry. Its emphasis is to use registration as a means of making a security interest effective against third parties, and providing an objective basis for determination of priority. Setting up effective registries, if none already exist, is therefore an essential element of implementation.

The role of registries in achieving "perfection"

Under UNCITRAL Model Law and its national equivalents, a key concept in making a security interest enforceable is that it must be capable of "perfection". This ensures that the rights of the lender taking the collateral interest will be effective against other parties who might be offered the same assets as security. Perfection starts with the creation of the security interest, which in the case of movable assets will involve

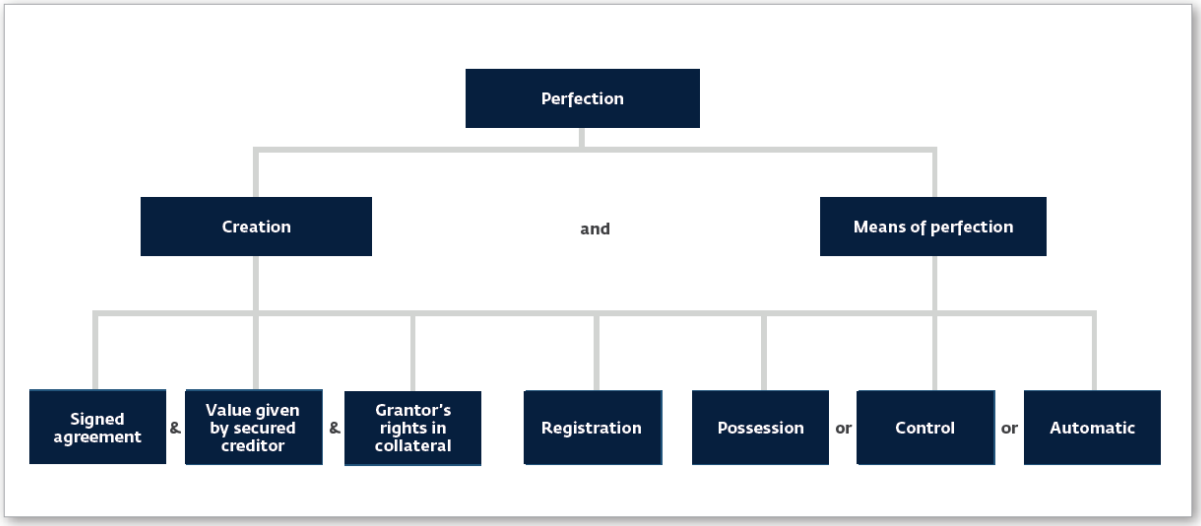
a signed agreement that grants rights in the collateral in exchange for the value given (namely, the secured loan).

The Model Law allows perfection to be achieved in a number of ways, but all involve registration. This ensures that third parties can be put on notice of the existence of an agreement. In some jurisdictions that have recently amended their laws to facilitate secured finance, such as Kenya and Zimbabwe, the only provision for notice to be given is via an act of registration.

Perfection and notice are both vital for the successful functioning of a secured finance market. For example, incorporation within a signed agreement of a negative pledge (an undertaking not to grant a competing security interest) means that disposal of the property being offered as collateral to a third party would be in breach of an agreement's terms; however, a negative pledge alone is not effective against a third-party creditor.

The World Bank uses the following figure to summarise what perfection entails. The concept of possession is seldom, if ever, applicable to movable assets, so perfection must either be automatic following creation and registration, or must involve some form of control.

Figure 2.1. Methods of perfecting a security interest



Source: Perfection requirements, World Bank, in (Wilson et al., 2019[11])

Characteristics of an effective register

The World Bank advocates that a government agency should be responsible for the register of security interests, but allows for different operational arrangements. There are examples where new registries are run entirely by a government entity (e.g. in Vietnam) and others where all aspects other than oversight are wholly outsourced (e.g. in Vanuatu). In Egypt and Nepal, the World Bank reports that private sector credit bureaux have been considered suitable bodies, and in other countries the hosting of the registry has been outsourced to the provider of the registry software (e.g. in Jamaica, Papua New Guinea and Tonga as well as Vanuatu). New collateral registries in other countries (particularly in Sub-Saharan Africa) have predominantly been set up by central banks (e.g. in Ghana, Liberia, Nigeria and Sierra Leone). In Canada, a private entity developed, maintains and secures collateral registries for seven Canadian provinces under a public-private partnership agreement (World Bank Group, 2019[24]) .

The key characteristics that registries must contain are (1) immutability, (2) searchability, and (3) comprehensiveness. Their usefulness may also be enhanced by the inclusion of, or ability to be easily cross-referenced against, complementary additional data. These characteristics are further explored below:

(1) Where competing security interests arise, the priority of those interests becomes important. In order to be effective in establishing and confirming priority, registries of collateral must be immutable. In practice, this means they operate on an "add-only" basis, so that historical records are never deleted or changed, but the current status of an asset remains readily discoverable by referring to the latest documentation concerning it.

(2) In order to provide an effective notice mechanism, it must be possible for interested parties to search the registry to determine whether a security interest exists. Registries that are fully accessible online offer significant advantages over older methods of paper filing which have been largely been superseded by online filing in many countries, a process that has accelerated over the past decade. The usual way of searching for (as well as recording) a security interest is to use the name, or preferably the unique numeric identifier, associated with the business entity providing the collateral. It follows that the place at which a company is required to be registered normally represents the logical repository for movable collateral data. This is generally a national body, though in some federal countries such as the United States, company registrations and statutory returns are dealt with at a sub-national level.

(3) As well as the identifying details of the security interest (the chargor/pledgor, the beneficiary of the security interest and the identity of the collateral), which may be uploaded to systems using designated web forms or other upload procedures, registries generally provide access to additional information such as copies of loan agreements. These enable a party contemplating purchase of an asset or using it as security to check the details of any current arrangement that is identified on the database record.

National laws may not require detailed descriptions of the assets that are subject to the security interest (and detailed descriptions are, in any event, difficult to provide over inventory or receivables). However, certainty over the type or category of assets that are involved may be very important in order to prevent one financier being able to exercise a monopoly over all possible forms of secured lending to a business by making a single advance. The concept of a "purchase money security interest" (the term used to describe a loan made to enable a company to buy an asset) in the UCC in the United States is intended to provide a means for additional lenders to make advances to companies by claiming security over a specific, additional asset.

The purpose and content of registration may vary by asset and transaction type

As noted above, movable assets come in a number of forms and are accounted for in a variety of ways; they can also be financed using a range of different products. Depending on the type of asset and the nature and structure of the transaction, the form and function of the security interest against them will differ, as will the detail of the registration procedure that is necessary or desirable. This is in part because the type and degree of control over the asset varies. This is an important consideration in perfecting a security interest; it also affects the practicalities of value realisation from collateral via disposal.

The level of control a financier can exercise over an asset ranges from complete control (via possession – a concept not normally relevant for movable assets), through partial control (via legal undertakings such as negative pledges, which as already noted have limitations), to minimal control (via a floating charge or an equivalent pledge structure within which the actual assets are used in the ordinary course of business and subject to continual change).

In typical asset-based lending products, the financier takes an ownership interest in the assets. Consequently, the right to repossess and dispose of them already exists (but is not invoked while a business makes repayments on a loan secured against them. In cases where an asset is taken as

collateral, this right to possess and dispose is generally contingent or conditional on other events or processes (the business owns them, but the financier may obtain ownership and the right to dispose as a consequence of a default on a related loan).

Collateral registration is important in order to facilitate both types of finance, but serves slightly different purposes. Since an asset-based lender retains ownership, the risk of a loss of value in insolvency is generally reduced; however, the risks of unauthorised dealing in the asset may remain. Provision of a notice mechanism to alert others to the existence of the ownership or security interest is vital in both cases.

Registers deliver benefits, but may be challenging to implement

(Love, Martinez Pería and Singh, 2016[5]) used firm-level studies to investigate the impact of introducing collateral registries for movable assets on the access to bank finance. It compares firm access to bank finance in seven countries that introduced collateral registries of this nature against three control groups.

The study noted that 18 countries had established collateral registries for movable assets in the decade prior to the study (the seven included in its sample were Bosnia, Croatia, Guatemala, Peru, Rwanda, Serbia and Ukraine). It found that the introduction of the registries does increase firm access to bank loans (by 7%; other benefits included reduced interest rates of up to 3% and longer loan maturities, extending by an average of six months). The study also found some evidence that the effect was larger among smaller firms.

Box 2.2. Examples of registry effects from International Finance Corporation

Many countries have chosen to modernise the laws regarding secured transactions governing movable property, in order to facilitate better access to finance for businesses. The focal points for these modernisation efforts have chiefly been focused on three areas: firstly, extending the types of movable assets that borrowers are able to harness as security (for example, by enabling future assets to be taken into account in security agreements; secondly, by establishing registries of collateral to help avoid conflicts, and by making these registries electronic in order to make them more cost-effective and user-friendly; and thirdly, by introducing legal reforms which confirm the priority of claims made by secured creditors, clarifying where other claimants rank in the priority order, and facilitating easier, quicker and more effective security interest enforcement procedures.

The International Finance Corporation (IFC), part of the World Bank Group, provides direct assistance to countries seeking to enact secured financing reforms (for its work with Vietnam, see Box 2.3). In 2016, for example, it reported that it had assisted Colombia in establishing a collateral registry in March 2014 and that the new registry in Mexico had implemented an electronic movable collateral registry with 97% of registrations supporting loans to SMEs.

IFC has also monitored the gains made by relevant reforms (for example in (IFC/MPDF/FIAS, 2007[27]) . Its studies indicate quantifiable improvements in the years immediately following the introduction of new laws and registries.

In Slovakia, secured transactions law reforms in 2002 permitted debtors to use all movable assets as collateral - present, future, tangible, and intangible - and abolished the requirement for specific descriptions of assets and debt. Over the following five years, this led to more than 70% of new business credit being secured by movables and receivables, and an increase in credit to the private sector of 10%.

In India, the Securitization Act of 2003 permits state-owned banks, which account for 90% of lending, to enforce security out of court. During the next two years, according to the World Bank Group's Doing Business database, time to recover collateral dropped from 10 years to nine months, and banks also reported a fall in the number of non-performing loans.

In Albania, a new law governing the use of collateral was passed and a collateral registry was set up in 2001. In the years that followed, the risk premium on lending fell by half, the interest rate spread fell by 43%, and the interest rate on lending fell by five percentage points.

When a new secured transaction system was introduced in Costa Rica it led to 9 500 new registrations in the first year, with more than 4 500 SMEs benefiting from loans.

Collateral registries can be difficult to introduce or improve. The remainder of this chapter focuses on each of the challenges which may be faced. Box 2.3, highlighting the journey made by Vietnam, shows the importance of moving the regulatory regime forward in concert with collateral registration systems, which must themselves remain up-to-date.

Research suggests there are seven main issues which may need to be addressed. These can be summarised as follows:

(1) Any collateral registry has to operate in the context of an underlying national legal framework, which typically contains layers of legal precedent. Some countries, such as China, draw on a number of different legal traditions; others are yet to adopt a tradition at all. These traditions have different ways of accommodating security interests in general (leading to variations in legal form and function); some may require reform in order to deal with movable assets.

(2) Even where a framework accommodates security interests in principle, it may not deal effectively with enforcement issues encountered in secured finance, such as the determining the priority of different and conflicting interests and issues of possession and control over assets. A collateral registry can support more efficient markets by ensuring that the type of security interest recorded is entirely clear.

(3) Where countries have a history of using secured lending, the methodology that registries can successfully adopt at introduction will always be influenced by the commercial practices that predate them. There may be additional complexities in federal countries, as illustrated by the experience of introducing UCC Article 9 in the United States.

(4) The Model Law generally discourages the use of specialist registries for particular classes of asset. However, initiatives to update and improve existing regimes may nevertheless need to accommodate pre-existing specialist registries whose commercial utility has been proven.

(5) Importantly, commercial practice does not stand still. Legal frameworks and registry functions may need to adapt in order to accommodate these changes. Case studies such as Canada's experience illustrate that early, commercially astute adopters of security interest regimes may act as 'test beds', bringing issues to the surface which later adopters are better placed to resolve.

(6) These changes in commercial practice may include using new classes of financial and non-financial asset. Intangible assets are a case in point.

(7) Technology also drives change in the ways in which registries operate, the services they can offer, and the assets they may be called on to record. Digitisation presents new opportunities for register authentication, such as Blockchain.

Box 2.3. Regulation and registry reform in Vietnam

The National Registration Agency for Secured Transactions (NRAST) was established in Vietnam as an agency under the Ministry of Justice in 2001, commencing its activities in 2002. NRAST's responsibilities include the operation of a national database of security interests. Its evolution, and that of the accompanying legal framework, demonstrates the importance of progressing legislative and operational aspects in parallel for best results (for a detailed review, see (Gullifer and Neo, 2021[28]).

When first introduced, the NRAST registration system was paper-based, presenting a range of obstacles to simple and affordable security interest registration and enquiry. Also, at the time, the legislative environment did not allow many types of movable asset to be harnessed as collateral. As a result, commercial lenders in Vietnam were reluctant to engage with the register, or in secured lending against anything other than immovable property.

The International Finance Corporation (IFC), part of the World Bank, has worked with the Ministry of Justice and with NRAST to conduct a phased reform of the secured transactions regime, in three phases. The first phase brought about a series of changes to legal and regulatory frameworks; the second focused on building a web-based registration system; the third on market development. Assisted by this specialist intervention, the registry has been updated to fully electronic operation, lending capacity has improved, and the laws governing activity have been progressively refined and adjusted.

Particular milestones include the adoption of a new Civil Code in 2015 and a Decree on Secured Device Registration (102/2017/ND-CP) in 2017, which have brought the legal and institutional framework into line with international best practice principles.

Vietnam's journey towards an effective security interest regime goes back to the 1995 Civil Code, which was the country's first legislation to facilitate movable security interests. This was followed by Decree 165 in 1999, which put in place provision for non-possessory pledges over assets including equipment,

inventory, receivables and intellectual property, and also confirmed that notaries did not have to be involved in security interest creation. However, the journey towards best practice was not smooth, with subsequent decrees and circulars acting to shape the lending environment against movable assets by restricting or even contradicting Decree 165 (for example, in the case of Decree 178, by requiring collateral valuations and favouring possessory pledges). The position worsened further in 2002 where Circular 6 imposed rules requiring future-acquired inventory to be specifically described and registered at NRAST.

Priority rules were an additional point of concern for lenders. For example, the 'first-to-file' rule was limited to creditors with a non-possessory pledge, leaving the status of pledgee rights where possession was taken unclear. The legislation also did not specify creditor's rights to the collateral on sale, and continued to give any claim the state might have over collateral priority over secured creditors, even if the state's claim arose later. These issues further dampened the use of movable property as collateral.

The first fruits of the IFC's engagement was the 2005 Civil Code. This provided for a broad concept of movable collateral, this time using the concept of a mortgage rather than a pledge for interests that were non-possessory. This was followed by Decree 163 the following year, which repealed a number of obstructive regulations. Collectively, these two measures made it substantially easier to create effective interests.

However, lenders remained slow to warm to them, partly because of the frictions inherent in the notice registration system, as demonstrated by an IFC survey in 2005 (IFC/MPDF/FIAS, 2007[27]). Since filing was inefficient and slow, searches were also slow and inaccurate, leading to a lack of reliability and therefore confidence. The manual nature of the process also led to elevated costs and perceived inconsistencies in processing.

The position in Vietnam has since improved substantially. A new web-based registration system was introduced in 2012, designed to operate in real time using more limited information, in accordance with international best practice principles. On the regulatory side, the 2015 Civil Code broadened the scope of permissible security interests including acknowledging future obligations for the first time. It also reduced the level of detail creditors needed to provide. Priority rules have now been strengthened and their effectiveness against third parties has been clarified. Amendments continue to be made by way of ongoing revisions, the most recent being in 2021.

The registration system was further upgraded in 2017 with a range of improvements to online access, payment and support. Statistics from the NRAST system estimate that in the period following these most recent upgrades (July 2017-December 2019), the system recorded 990,000 new registrations, bringing the total to almost 2 million. It is estimated by IFC that this has facilitated USD 91.6bn in financing for over 1m SMEs and approximately 68k micro-businesses (Gullifer and Neo, 2021[28]).

Challenge (1): the role of the underlying national legal framework

Available types of security interest

The first challenge policymakers will need to consider when implementing or improving a collateral registry for their country is whether the underlying legal framework accommodates suitable forms of security interests to deal with movable assets.

Most legal frameworks provide for mortgages, and it is theoretically possible (in some territories) to take a mortgage over movable assets, both tangible and intangible. However, it is seldom desirable to do so, for reasons of legal form, process complexity and transaction cost. Accordingly, in many countries, commercial and legal approaches have been developed that recognise the difference between a security

interest in an asset that is essentially constant or "fixed" versus an interest that has to be flexible or "floating", in respect of the specific assets to which it relates. This distinction is investigated further below.

The legal form of the security interest in the collateral varies, firstly according to whether common or civil law is applicable, and thereafter based on national law and custom. The mechanism normally used is a pledge, charge or lien.

These three terms (pledge, charge, lien) have different meanings in different frameworks (for example, in common law, a pledge is possessory in nature, so is inherently unsuitable for movable assets, but the same limitation does not apply in civil law). Similarly, the term "lien" is widely used in the United States to indicate a non-possessory security interest, whereas in other common law countries its use implies possession. These differences need to be understood by commercial practitioners as well as policymakers, especially when seeking to take security over assets that may be subject to different legal frameworks owing to their origin or location (which may include intellectual property rights). Box 2.4 provides further insights.

Box 2.4. International variations in forms of security interest

In most civil law countries, including France, Germany and Spain, there is generally legal provision for a commercial pledge to be taken over a pool of movable assets that relate to a business's operations, provided that these are of a long-term nature and of value. This can be applied to inventory and to several classes of tangible and intangible assets. These include equipment, machinery and tools (in the case of tangibles) and intellectual property, goodwill and leases (in the case of intangibles).

Some countries' legal regimes allow for property to be pledged, but do not have an equivalent of a floating charge. Korea is an example of a country that identified a gap in this area that is not covered by its existing legislation on mortgages or corporate securities, particularly in respect of the fact that these interests do not bind on future assets. These gaps will most likely be addressed by further changes to the country's laws on movable assets (last revised in 2018).

As previously noted, in the United States, Article 9 of the Uniform Commercial Code (which does not apply to real estate) contains the concept of a "purchase money security interest" (PMSI). This grants a creditor the right to take possession of specified movable property on the basis that the creditor has supplied the funds to buy it, dependent on the occurrence of certain events such as loan default. This security interest generally needs to be perfected by registering its existence with the government office where the company is incorporated.

Article 9 also implements the concept a floating lien, which has a similar effect to a floating charge (other than that it can be granted by anyone: a charge has to be granted by a company). The enforcement of security interests may however be made more complicated by the creditor protection offered by Chapter 11 of the Bankruptcy Code, designed to encourage the preservation of businesses as going concerns by facilitating their reorganisation.

Countries such as Australia, Canada and New Zealand have implemented similar laws to the United States (which as previously noted are compatible with the unitary principals set out in the UNCITRAL Model Law), also taking the opportunity to introduce federal- rather than state-level registries of security interests. However, the way in which Canadian law has been implemented on a federal basis has given rise to complications, as noted below.

Fixed vs. floating security interests

The distinction between a security interest that is fixed in nature compared with one that is floating primarily reflects the degree of control that a lender can reasonably exercise. A security interest against an asset that is fixed in nature (i.e. not subject to change) can require the business not to permit it to be disposed of or impaired in any way without the lender's permission.

By contrast, the reason for holding assets that are continually changing is that they are used up or disposed of in the ordinary course of business (and are expected to be replaced with others). It is therefore in the interests of the financier to permit this business activity to continue, as to do otherwise would be to the detriment of the company's ability to service its debt. However, doing so inevitably compromises control.

Since a floating security interest anticipates that the assets a business owns today will be different tomorrow, it is by its nature able to be forward-looking in nature. The borrower is therefore free to remove and replace assets from the floating security interest as it sees fit. A fixed security interest (whether a charge, pledge or lien) is not inherently forward-looking in the same way; the agreement wording can be modified but as observed below, a practical difficulty may arise in respect of perfection and notice.

Challenge (1) can therefore be summarised as follows: a security interest over an asset has to be "appropriate", i.e. practicable, both in terms of the burden its creation places on the lender and the types of use that it permits the borrower to make. A registry cannot be effective unless the types of security it records are workable from a commercial and legal point of view.

Challenge (2): enforcement of security interests

Taking control over secured assets

Having established that a workable security interest can be created, the next question policymakers need to address is whether it will prove enforceable when needed (typically in the event of a default).

In general, when a lender needs to take control of collateralised assets, owing to a default or other defined event such as a company winding-up, it needs to determine what it now owns. A default event is the usual trigger that causes the floating nature of a security interest to change to a fixed one, and no further use or disposal (in the ordinary course of business or otherwise) will be permitted. This process is known as "crystallisation"; it can happen automatically in some jurisdictions, but generally involves provision of notice by the lender.

A commercial pledge over pooled assets, as described in Box 2.2 above, operates in a different way. It does not crystallise and attach to individual items, but is treated as a single security asset, which ranks ahead of all secured and unsecured claims. In this respect it provides a more effective remedy than a floating charge in common law.

This act of taking control may not necessarily result in a sale of the assets. It is often the case that a lender may prefer to appoint an administrative receiver in the event of a default to seek to sell or refinance the borrower as a going concern. The importance of the security interest (which as explained above is typically perfected through registration under the Model Law) is that it gives the lender the right to take over the business, which (by definition) will involve dealing in the secured assets, which may be sold if this represents the optimum route to value recovery.

It is notable that in some European countries, there are time limits that must be observed before a security interest can be enforced. As an example, the United Kingdom has recently redefined (UK Government, 2020[29]) the moratorium period available to companies undergoing restructuring, during which period a fixed charge is enforceable but a floating charge is not.

Prior to crystallisation, which is the point at which the different types of security interests become aligned with each other, a floating charge or pooled pledge represents distinctly different risks for a lender compared with a fixed charge. Because the assets to which it relates are subject to continuous change, it is neither possible nor desirable to identify them individually (generally lenders satisfy themselves via periodic checks, which can increasingly be conducted electronically rather than physically, that the borrower is dealing with them in an appropriate manner). It is therefore only possible to notify other potential lenders of the existence of a floating charge by recording it against the company (which also perfects it).

These risks change post-crystallisation. Because a common law floating charge arises in equity rather than in law, it is not effective against any purchaser buying the assets who has no knowledge or notice of the existence of the floating charge.

Issues of priority

As previously noted, the act of registration provides a convenient mechanism for determining the priority of potentially competing secured interests, and is one of the main reasons why registries are so important to facilitate commerce. However, security interests also need to be enforceable against other forms of indebtedness.

Under common law, for example, a fixed charge or mortgage ranks ahead of preferential creditors (though some creditors, such as government tax authorities, may be 'super-preferential'), but a floating charge ranks behind them. This provides an incentive for lenders to capture as many important assets within a fixed rather than floating charge as possible, and to ensure they are appropriately registered[4]. Without registration and perfection, a security interest may prove to be unenforceable on bankruptcy of the debtor (i.e. other liabilities will take priority over it).

A further potential problem for a fixed charge and its equivalents under common law is that if it has not attached to the assets (because it has not been properly described or documented), has not been perfected, and/or does not in fact provide the level of control over the secured assets as the fixed interest implies, it could be re-characterised by a court as a floating charge, and thus effectively lose its priority.

It is therefore evident that the type of security taken (from the different options that may be available in each legal jurisdiction), the use of correct documentation and the process of perfection are key to enforceability. Even where legal frameworks support a security interest, and the mechanisms are available to perfect such interests through registration, lenders still have to ensure that appropriate procedures are followed in each individual case.

Recognising the complexity of this position, and the commercial implications of failure to perfect a security interest in a legally enforceable manner, policymakers need to ensure that the procedures for registration make the nature of the security interest abundantly clear.

Challenge (3): accommodating existing commercial practices

Reconciling old and new approaches

Once legal concerns over the availability of effective security interests in law can be satisfied, the next challenge for policymakers is to determine how the collateral registration regime should best accommodate them. It can be difficult to establish a comprehensive approach where the theoretical benefits of the Model

[4] A similar characterisation can be applied to receivables, though case law (House of Lords, United Kingdom, 2005) has indicated that receivables can be subject to a fixed charge if the secured creditor has control over them (for example, because the debts are due to be paid to the creditor or into a blocked account).

Law approach are at odds with long-established commercial customs and practices. This can best be illustrated by way of a case study example from the market on which the Model Law principles are based, namely the United States (see Box 2.5).

Box 2.5. Purchase Money Security Interests vs. Certificates of Title

The Uniform Commercial Code (UCC), including Article 9 covering secured transactions, was first published in 1952. It was fully revised in 1962; Article 9 was substantially updated in 1998 and further amended in 2010. It is one of the most comprehensive approaches to security interests in the world, though as set out below, it still has to accommodate important pre-existing exceptions.

One of the cornerstones contained in UCC Article 9 in the United States is the concept of a Purchase Money Security Interest (PMSI). Where a financier lends money to a borrower to purchase a specified asset, the financier can obtain a "super-priority" security interest over the assets that are bought, provided that the borrower does in fact purchase them. A PMSI can also enable a seller providing goods sold on credit terms to obtain a super-priority security interest in those goods, which can be used to secure the buyer's obligation to pay the deferred purchase price. This can apply even if the credit that the seller is offering is in fact serviced by a third party financier (such as an asset-based lender).

One of the arguments in favour of a PMSI is that it enables the purchase of certain goods to be "carved out" from an otherwise blanket security interest (usually held by a bank) which will provide a priority interest in all inventory and proceeds owned by the debtor. In this way it prevents a bank from being able to exercise a monopoly over financing flows and give the creditor better access to capital, provided that the goods to be purchased are not already specifically identifiable.

Normally, under UCC Article 9, in the event that other secured creditors exist, collateral rights are awarded in the order that security agreements have been perfected. If for some reason the security agreements have not been perfected, the priority is granted in the order they are attached. The term super-priority indicates that a creditor with a PMSI can have first priority in the event of there being more than one secured creditor. This makes it particularly important that PMSI filings are notified to other secured creditors and that searches are conducted to ensure no rights already exist over the goods.

A typical scenario in which it would be expected to be desirable for a financier to have a PMSI and the associated super-priority would be when financing the purchase of a larger and more valuable asset such as a car, which is regarded as an item of personal property. However, alongside aircraft and ships (and real property such as houses), motor vehicles fall outside this provision of the UCC.

The reason that vehicles are "carved out" is because UCC Article 9 has not replaced pre-existing legislation concerning Certificates of Title for certain types of personal property. These documents (informally known as "pink slips" in the case of vehicles) are state agency-issued documents which officially grant ownership to the holder of the property they reference.

Where a vehicle is financed using a loan, the certificate will identify the existence of the outstanding lien or loan. The lender will retain the title document until the obligation has been satisfied, at which point it will be issued to the owner. As a result, large lenders have to retain substantial physical filing systems for documents which have to be produced before clear title can be demonstrated in respect of a vehicle. This introduces friction and complexity into normal disposal routes such as vehicle auctions.

It will be seen that, whilst a PMSI (also a feature of the Model Law) represents a mechanism to retain a security interest in personal property until a loan against it is fully repaid, such a mechanism cannot only operate within the bounds of ownership that actually exist. A lender with a certificate already has a better title to the goods than a PMSI can confer.

Despite recent reforms, the exclusion of some types of property from legislation which aims to offer a consistent approach to all types of property is not the only complication in the application of Article 9. While there is now standardisation in the basic format of the financing statement that must be filed (the UCC-1 form), and the updates to UCC Article 9 have confirmed that in nearly all cases the filing must be made in the state where the debtor is located (which might be different from the location of the collateral), there are variations in the state-level rules for filing it. California, for example, has its own commercial code, and some states do not allow UCC filings for multiple functions under Article 9.

Uncertain documentation status

A further complication in the United States system described in the accompanying panel is that a certificate of title is not a guarantee of a free and clear title, because there is always a possibility that a lien exists but has not been recorded; that information is incorrect; or that fraudulent activity has taken place. The existence of this risk is one of the reasons why the status of official government documentation governing movable assets such as vehicles varies by country. In the United Kingdom, for example, the equivalent document to the certificate of title is a V5 registration document; this does not purport to show the legal owner of a vehicle, but only the registered keeper, who is deemed to be the person responsible for it (for purposes such as law enforcement).

Also, the distinction that exists between what is and is not registrable may vary in the United States depending on the financing instrument used as well as the asset. Leases, for example, cause a conflict between UCC Articles 2A and 9, where they are only registrable if they are security leases over a short term; in other words, the same legal instrument (a lease) may be treated differently depending on its purpose and its duration.

In summary, the conflict between PMSIs and certificates of title, the variations in state-level application of security rules and the different treatments that may be required for ostensibly similar financial instruments illustrate the difficulty in implementing a wholly consistent system for security interests. It is important therefore for policymakers to give careful consideration to ways in which conflicts can be avoided, minimising the scope for confusion.

Challenge (4): the role and status of specialist registries

The elevated risks of financing movable assets

There are particularly significant benefits in registering security interests against assets which are movable. A financier faces a substantial risk that a tangible or intangible non-financial movable asset may be disposed of without authorisation, with no opportunity to prevent such a disposal based on knowledge of the asset's whereabouts.

For the reasons noted above, if a security interest is not perfected and priority is not established, a fraudulent sale or secondary use of the asset as collateral may extinguish the title of the original financier. Even where title can be upheld, overlapping finance interests introduce a risk of substantial additional complication and cost.

It is common for certain categories of movable assets (particularly vehicles, but also other types of tangible and intangible non-financial movable property) to require replacement during their useful life, involving a change of ownership. It may also be necessary to sell the asset in order to repay the finance that has been secured against it (and it may be illegal to dispose of certain types of asset, such as real property, without satisfying existing debts secured on it).

When a sale occurs it may be necessary to update one security interest that has been satisfied and replace it with another: it will also be important for a dealer in the assets to know who should receive the proceeds from the sale (or part-exchange).

The more efficient disposal markets for identified used assets become, the greater the opportunity and motivation for fraudulently selling, or borrowing against the value of, goods that still belong to a financier.

The role of specialist registries

It is therefore common practice in developed markets where movable assets are readily identifiable to record the existence of security interests (whether they relate to asset-based loans or security used as collateral for lending) on specialist registers, referenced using official identifiers such as vehicle identification numbers and registration numbers. These registers may have an important role to play in facilitating an active market in an asset class. They may require the establishment of a dedicated finance register, such as those for motor vehicles, which are long-established in the United Kingdom (see panel) and the United States, among others.

Alternatively, information on financial interests may be added to existing specialist registers, such as official records of patent and trade mark rights. They may be appended to the existing record directly, or as in the case of China, noted in a separate registry of pledges.

Box 2.6. The example of HPI Limited in the United Kingdom as a specialist registry

Maintenance of certain registers (such as details of vehicles allowed to be driven on the road) are traditionally the responsibility of policy makers. However, market provision can play an instrumental role to mitigate risks associated with moveable assets. A UK example, Hire Purchase Information ("HPI"), is instructive in this regard.

Concern among financiers at the growing incidence of fraudulent activity in motor vehicles led the six leading finance companies of the day to establish and jointly fund a data sharing initiative in 1938. Each finance company shared information on the hire purchase agreements it was issuing with a central repository that included the numeric identifier of the vehicle being financed. If the details provided by one lender matched a vehicle that was already recorded as being owned by another financier, both parties were notified.

Use of the HPI service broadened rapidly, as did the sophistication of the data and services the company was able to provide. It became standard UK industry practice for motor vehicle dealers to consult HPI records to determine whether a vehicle being offered in part-exchange was still subject to a finance agreement, thus facilitating loan repayment. Additional data was appended to the system to record police stolen vehicle notifications (in 1947) and later, insurance "write-offs" (serious accident damage). Vehicle identification data from official databases provided a means of ensuring that both financial interests and status/condition markers could be reliably attached to the correct asset.

The founding finance companies sold their interest in HPI in the early 1990s to credit reference agency, UAPT-Infolink, with a five-year exclusivity provision. On expiry of the exclusivity window, the market was entered by another credit reference agency, CCN (now Experian), in the late 1990s and a data exchange mechanism established between the two companies to synchronise finance agreement data regardless of the agency with which it had been registered.

Risks related to multiple registration

Secured lenders have strong incentives to record their security interests in specialist databases, as they are likely to provide a more effective notice mechanism than a more generalised entry in a collateral registry that is accessible by company name or number rather than individual asset identifiers. Where there is a common practice of consulting such registries at resale, they make disposals easier and safer for financiers, and are likely to increase confidence in collateral value. In the case of a vehicle, a third party such as a dealer may have no ready means of identifying a corporate body that may own it, and so the only practical method of establishing status is to enquire against the individual asset identifier.

However, as soon as registration becomes necessary or desirable in more than one place, two problems may arise. The first is that failure to register in either might undermine the priority of a security interest (or at the very least, introduce considerable additional cost and complexity in establishing priority and reversing or restructuring a transaction that may already have taken place). The second is that it increases the likelihood that a buyer of a particular identifiable asset may have no notice of the security interest and therefore obtain title to it.

The general view of the World Bank is that "it is not practically or financially sustainable to preserve or establish specialised registries, such as for financial leases or pledges over agricultural equipment" (World Bank Group, 2019[24]). Nevertheless, existing legislative structures do not resolve this ambiguity. For example, while the UNCITRAL Legislative Guide provides for the possibility of secured transactions laws which accommodate established specialised registries (other than for inventory), it may not determine which entry would have priority.

Where new collateral registries are established, it may be practical to integrate additional sources of relevant government-held data (such as registration details for motor vehicles) and use this information to help ensure that security interests attach to the correct asset. A single (preferably electronic) enquiry can thus determine whether a specific asset is encumbered and who owns it.

Otherwise, where specialist registries not embodied in the law have a market benefit, it is therefore important for secured finance providers to develop clear codes of industry practice in order to minimise the possibility of dispute: these may be overseen by industry bodies (an example in the United Kingdom being the Finance and Leasing Association).

When seeking to reform security legislation or introduce collateral registries, policymakers therefore need to exercise caution in determining how to accommodate long-standing specialist registries, within a holistic approach that will facilitate rather than impede both asset financing and legitimate trade in the same assets post-finance.

Challenge (5): accommodating evolving commercial practice

"First mover" risks

Policymakers contemplating the introduction or improvement of a security regime by introducing or updating a registry may be aware that the ease with which an effective security interest over an asset class can be established and enforced may provide one state or country with an economic advantage over its neighbours. Both financiers and companies value convenience and efficiency. However, given the continuous evolution of commercial practice, it does not always follow that the regime which is quickest to adopt the type of approach set out in the Model Law will necessarily reap the highest rewards through having the most efficient system. This may give rise to the need to update the register and accompanying framework on a timely basis. Box 2.7 illustrates this point.

Box 2.7. Case study: The personal property security law in Canada

Legislation to implement a new security regime in Canada is known as the Personal Property Security Act (PPSA). It includes the provision for PMSIs and creation of "super-priority" interests, explained above, and placed an emphasis on registration as the normal means of perfecting an interest (though under some circumstances possession can be considered the superior form).

The legislation was first introduced in Ontario, followed by the remaining provinces and territories, but they chose to follow a different uniform model with a number of differences, partly based on being able to observe how the law was working in Ontario. Certain security interests, including those relating to loans granted by banks and taken over patents, copyrights and trademarks, are governed by separate federal legislation.

In Ontario, the law as initially enacted provided for two forms of security interest, namely a floating charge and a floating lien. This was accompanied by the adoption of categories of asset (such as inventory, consumer goods, etc.) against which the interest relates. However, it became apparent following enactment that this approach presented a technical difficulty. As explained above, a floating charge does not attach to particular assets until such time as it crystallises, yet the personal property security regime requires there to be attachment in order for an effective interest to be present. It also means that it becomes difficult to provide notice filing.

As a result of this difficulty, other provinces and territories opted to emphasise only the floating lien, abandoning the concept of the floating charge as being overly complex. However, these laws are not unified, with Quebec following a corresponding civil code act rather than PPSA. Some Canadian provinces also require party names to be registered in English and French, whereas others do not.

Ontario has subsequently amended some of its personal property laws, to facilitate electronic registration and to clarify (among other matters) the place where the registration should be made in respect of a company. However, this now introduces a new discrepancy between its law and that of other provinces and territories. Changes have also been proposed to remove the 'check-box' system for classifying types of collateral in favour of narrative descriptions, though their implementation was initially delayed

Response to first mover risk

Canada's experiences illustrate to policymakers that enactment of a security interest regime is not a 'fit and forget' exercise. The way in which one country, state, province or territory enacts its legislation is unlikely to be completely compatible with another. This is partly because the underlying legal traditions are wider than new legislation can satisfactorily "ring-fence", and partly because different states may see opportunities to improve, and thereby depart from, practice elsewhere.

One lesson to be drawn from this experience is that it may be advisable to focus primarily on regimes for particular categories of asset that are regularly financed (so will attract registrations) and regularly traded (so will attract status enquiries). Systems that seek to be all-embracing are very likely to be challenged by peripheral or "edge" cases which expose their weaknesses. There is no commercial justification for ensuring that a regime covers low value assets, especially in the case of consumer goods that only have significant value when new (such as personal computers).

Challenge (6): harnessing alternative assets such as intangibles as security

Alternative assets may have a different form and legal status

The changes to the way in which the location of a borrower is defined in Canada have recently raised specific questions regarding the way in which intangible assets, which lack physical substance, should most appropriately be registered; this raises the wider question of how security interest regimes accommodate asset classes that are not new, but whose importance in financing is rapidly increasing.

Intellectual property rights and other identifiable intangible assets should inherently be usable as security for lending and may be pledged or charged because they are widely regarded as being personal in nature. However, they cannot be "repossessed" in the same way as tangible assets, since by definition they lack physical substance. At the same time, they are not merely contractual either.

Also, while there is a large body of case law concerning IP-related matters such as infringement and validity, there is not a large number of reference points for the practical application of security interests to them. There are separate bodies of law concerning intellectual property in individual countries, some of which (e.g. Malaysia) have had to enact regulatory changes to enable particular sub-categories of asset to qualify as 'property' to which secured finance interests can be applied. Furthermore, the wording of agreements made needs to be careful not to undermine or modify these laws.

Recognising these complexities, UNCITRAL has produced a separate Legislative Guide supplement on the application of security rights to intellectual property in order to promote and facilitate their use (United Nations, 2011[30]). This sets out that the only way to perfect a security interest in intellectual property is to register it. Intellectual property is specifically included as a qualifying asset class within laws passed in a number of States in recent years, such as Kenya (noting that this was a broad enabling measure which also included very different classes of movable assets, such as livestock).

Applicable types of security interest and registration practice

Generally speaking, a fixed charge or equivalent pledge is the preferred form of security for intellectual property rights that are specifically identifiable. A mortgage is administratively difficult and could leave a lender responsible for, and liable for, the rights; a transfer of ownership is not normally desirable unless the assets are also licensed back with full rights of use (and all associated obligations regarding maintenance and enforcement) (Gullifer, 2017[31]) . It is possible also to take a floating charge or pooled pledge over types of intangible asset that are subject to continuous change or not readily identifiable (though this may be undesirable in common law countries owing to the differences in the priority floating charges enjoy over other interests).

There are some challenges in the application of a fixed charge or equivalent pledge (Kerrigan, 2019[32]) . A case in point relates to the ways in which the lender can preserve the necessary element of control required by security interest legislation while leaving the borrower free to deal in the rights, for example by way of licensing them (a non-exclusive licence is more obviously compatible with the principle of a lender retaining control than an exclusive licence would be). The risk here in common law concerns re-characterisation, (the term given when a court determines that even though a document declares a charge to be fixed, it is in fact floating) (Whitehead, 2014[33]).

Clauses also need to be thoughtfully drafted with respect to IP that is created subsequent to the agreement, in terms of setting out appropriate steps to ensure these new assets are captured by an existing security interest that is not floating in nature. Also, it is preferable for IP rights to be identified individually to ensure that if the borrower does anything to undermine the effectiveness of the charge against one asset or asset category, it still attaches to the remainder.

For these reasons, the prudent legal view is that registration of a security interest against IP in a general fashion as part of a charging document should preferably be accompanied by sufficient details to enable the IP assets to be identified where they are of importance. Further, the relevant IP register (where one exists) should be notified of the security interest in case the borrower attempts to dispose of it, contrary to the terms of the financing agreement; otherwise, enquiries made by a buyer or financier into the IP rights in the context of a proposed transaction may fail to identify its existence. This means that registration on multiple registries (by company and by asset) is considered best practice.

IP has already received some policy attention. As part of China's moves to facilitate IP-backed financing, three separate registries were established for patents, trademarks and copyright assets. It is understood to be necessary for an appropriate registration to be made on the relevant register in order to record and perfect the security interest. Lenders can also make enquiries regarding the status of a company or an asset on these dedicated registers, but other parties who might wish to purchase the assets cannot query them without authorisation. In theory, pledge data is also available from the official state records at CNIPA, though in practice, it does not always appear to be present – raising at least the theoretical possibility that a lender could lose title through the absence of notice (though at least not to another lender).

The importance of having an effective security interest that has been perfected, has clear priority and for which an effective notice mechanism is in place is heightened if the principal assets owned by the borrower are intangible. Where there are few other assets, and/or the dependency on the charged or pledged assets is high, it is unlikely that the business will be able to continue trading without use of them. Consequently, a default on a loan secured against IP that cannot be remedied is highly likely to lead to an insolvency event; this is an important consideration in obtaining the most desirable form of security interest.

Opportunities to apply new digital technologies to collateral registries

Digitisation and digital assets

The final challenge listed is that of technological change. However, in the case of collateral registries, this is perhaps more of an opportunity than a challenge. The use of electronic, automated services in many territories means that a range of checks can already be conducted that improve the accuracy of the security interest registration process, for example by ensuring that registration records are complete, provided (and if necessary amended and/or removed) by an authorised person, accurately time-stamped and held in a secure manner. Costa Rica is an example of a country that has made progress with digitisation of its collateral register since its introduction in 2015.

A further benefit of an open electronic register is that it facilitates distribution of credit-related data to reduce information asymmetries. In the United States, for example, credit reporting agencies such as Dun & Bradstreet may purchase collateral registry data and include it within their reports.

A further potential development concerns the possibility of using assets as collateral that are themselves digital, such as tokens. Here, a distinction can be drawn between assets that are "native" because they are indivisible from the ledger record (such as Bitcoin) and assets that are "non-native" because they purport to represent an underlying physical or non-physical asset. In some cases it is possible for assets to move from one status to another, for example from being specified as an investment to being a general intangible based on a change in its associated properties actioned by the issuer. In any event, a token will need to be appropriately classified by type (for example, if a financial asset, whether it is a receivable or a deposit), because it may be subject to types of regulation that go beyond secured finance law.

The suitability of such assets for use must first be established by reference to local law, regardless of how it will be recorded. In both common law and civil law, a digital asset should be capable of being regarded as an object of property for it to be suitable for use as security, which generally means that it needs to be

specific and identifiable. However, digital assets and structures for trading in them have undergone rapid development in recent years and not all legal frameworks accommodate them optimally; this may have consequences for both grantors and grantees of security interests, particularly in the case of insolvency.

Digital ledger technology

The availability of digital ledger technologies (particularly those based on blockchain) may create new challenges and opportunities for security regimes, though analysis is complicated by the fact that as of mid-2020, there are no collateral registers utilising digital ledger technology (World Bank Group, 2020[25]). The first challenge documented in this chapter, concerning the diverse nature of legal regimes around the world, arguably makes a collateral registry function harder to disrupt than other transactional records where blockchain has made inroads; specifically, the legal status of the record itself might be open to question, a point which will require careful consideration by policymakers, especially in Europe (Pinto and Silva, 2020[34]).

Digital ledgers used in other contexts may be “permissioned” or “permissionless”. The former type is preferable for applications such as collateral records, because it allows access to registers to be controlled and monitored. These ledgers have advantages in ensuring that records are immutable, and they could be deployed not only to establish digital registration of a security interest but also to update it (for example, as new assets are added and old ones removed) or potentially even to tokenise it.

However, no current technology appears likely to act as a “one-stop shop”, as systems such as blockchain store hashes identifying transactions rather than the transaction detail itself; this means that while the digital ledger may be highly secure and robust, other associated systems may be required to find the identifiers needed to use it, which will be less robust. As previously noted, the added value of this additional identification element may be substantial. In addition, to take a movable asset example, control of a token representing a vehicle in an automotive dealer’s stock would not perfect a security interest in the asset.

Moreover, digital ledgers do not of themselves address the problem of inaccurate information provision, which legal frameworks determine to be the responsibility of the registrant. Also, they are not necessarily any more or less interoperable than other systems; and while in many cases blockchain technology acts to disrupt and disintermediate relationships, there are reasons why appropriate custodians may need to be created for certain functions, not least because of the threat to creditors that insolvency of a digital ledger provider otherwise creates (World Bank Group, 2020[25])

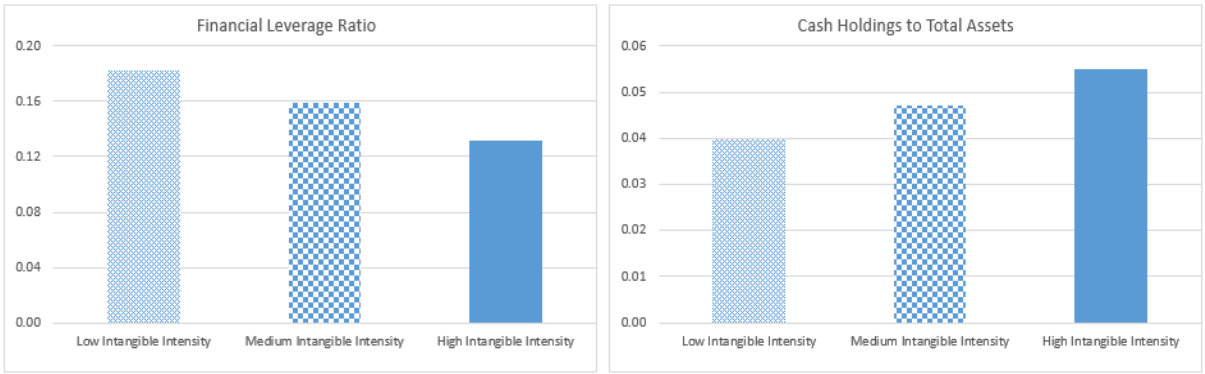
The fact that the operator of a digital ledger claims to have a “notary function” does not mean that this status is legally recognised, or recognisable. However, as noted above in the context of specialist registries, the UNCITRAL Model Law on Secured Transactions already allows for the creation of registers that enhance the integrity of existing registers (without necessarily taking on legal force). One possible use of blockchain may therefore be to deploy it alongside official registries.

3. Collateralisation of intangible assets: A potential policy focus

Intangible assets now constitute a large proportion of corporate value. As a proportion of market capitalisation in 2020, assets that are not tangible were estimated to account for 90% of the value of S&P 500 companies in the US, and 75% of the S&P 350 in Europe. Even in more manufacturing-intensive economies such as China, their importance is growing, accounting for 44% of companies valued on the Shanghai Shenzhen index in 2020 (Ocean Tomo, 2021[35]). This growing importance is attributable to a wide variety of market factors (including digitalisation, broader technological change and global outsourcing trends).

Intangibles are a long-standing area of policy interest, but the focus on them has increased post-pandemic, not least because investment in this asset class is recognised as an important driver of productivity. However, the characteristics of intangible assets make their financing more complex than tangibles. Many firms, particularly SMEs, face frictions that constrain the investment they are able to make in the asset class; this has implications that may prevent the full potential of intangibles from being harnessed. Specifically, where external finance is harder or prohibitively expensive to obtain, companies will rely more heavily on internal sources of finance (e.g. retained cash/profits), with negative implications for overall productivity growth. This trend is evident from the following charts (Demmou and Franco, 2021[36]).

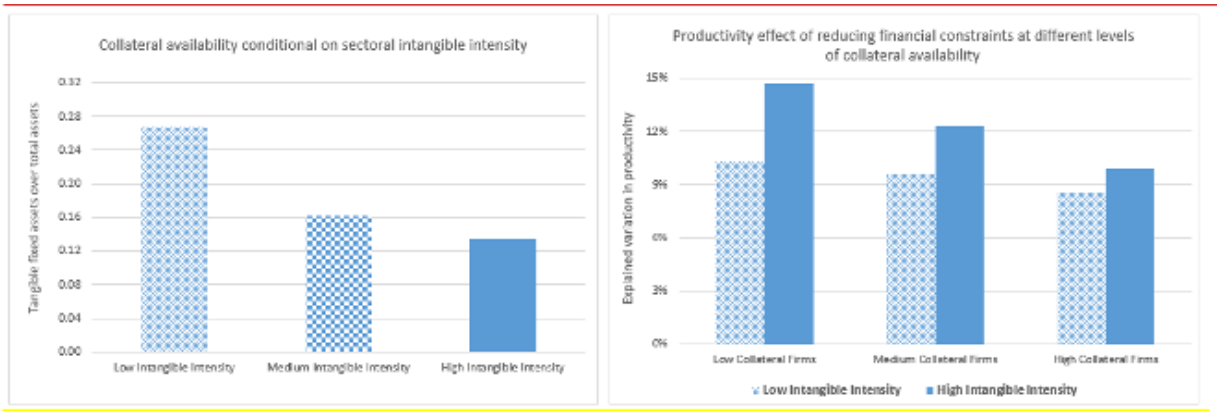
Figure 3.1. Financial leverage and intangible intensity, 1995-2015



The figure shows the median financial leverage ratio (financial debt over total assets; left panel) and the median cash holdings ratio (cash holdings over total assets; right panel) across firms grouped according to terciles of sectoral intangible intensity. Calculations are carried out over the 1995-2015 period and include firms located in 29 countries (AUS, AUT, BEL, CHN, DEU, DNK, ESP, EST, FIN, FRA, GBR, GRC, HUN, IDN, IND, IRL, ITA, JPN, KOR, LUX, LVA, NLD, POL, PRT, RUS, SVN, SWE, TUR, ZAF).
Source: OECD calculations on Orbis and Compustat data.

A further exercise conducted for forthcoming OECD research examines the availability of collateral by sector (based on balance sheet analysis alongside modelling of the productivity effect obtainable by reducing financial constraints at differing levels of collateral availability. This confirms that high intangible intensity sectors have substantially less collateral to offer than lower intangible intensity sectors (left hand chart) but also indicates that the positive effects on growth when these constraints are removed is considerably greater for firms with high intangible intensity.

Figure 3.2. Reasons firms are not able to obtain credit



The left panel shows the median tangible assets over total assets ratio across firms grouped according to terciles of our sectoral intangible intensity (Annex B). The right panel presents the productivity effect of relaxing financing constraints for firms with different availability of collateral, distinguishing between high and low intangible-intensive sectors. The marginal effects are calculated on the basis of specification (1) in Table E.2. Collateral availability at the firm level is proxied by the ratio of tangible fixed assets to total assets. Calculations are carried out over the 1995-2015 period and includes firms located in 29 countries (AUS, AUT, BEL, CHN, DEU, DNK, ESP, EST, FIN, FRA, GBR, GRC, HUN, IDN, IND, IRL, ITA, JPN, KOR, LUX, LVA, NLD, POL, PRT, RUS, SVN, SWE, TUR, ZAF).
Source: OECD calculations on Orbis and Compustat data.

The birth of asset finance during the Industrial Revolution meant that companies became able to use the collateral value of the assets they needed to purchase, or that they already owned, to obtain the finance necessary to fund increased productivity. These assets were primarily physical items such as buildings, machinery and equipment. In the knowledge economy, the equivalent assets needing to be acquired or leveraged are intangible rather than tangible, but that financing systems have not adapted to recognise their value in the same way (Jarboe and Furrow, 2008[37]). Establishing mechanisms that make effective use of intangible assets as collateral directly addresses this situation.

The collateralisation approaches applicable to intangible assets

Intangible assets do not qualify for capital relief under Basel III regulations. However, lenders may be able to apply to national regulators for permission to apply their own weightings, provided these are backed by sufficient evidence (Brassell and King, 2013[38]).

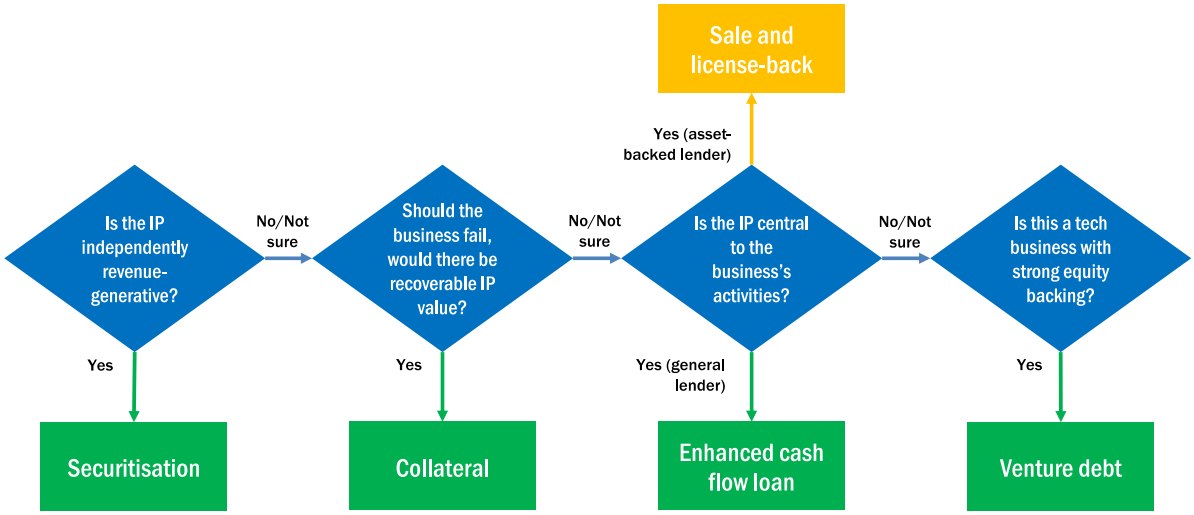
The primary barrier to provision of capital relief on intangibles appears to be uncertain disposal value. This uncertainty, in turn, is due to an underlying difference in the character of intangible assets compared with tangible ones.

The value of most tangible assets is underpinned by their resale value, determined by reference to historical precedent, which can typically be identified with some confidence from publicly available data

featuring directly comparable transactions. By contrast, intangible assets (being predominantly firm-specific and internally generated) are not commodities that are regularly traded; their value derives from their uniqueness. Also, although they are regularly transacted, this usually happens as part of a larger transaction such as a merger or acquisition; this is because an SME will not willingly sell core IP and intangibles on their own, because it cannot continue to trade without these assets (i.e. they are too important to sell). Accordingly, commercial dealing in IP and intangibles is usually conducted by way of licensing, which does not involve a loss of ownership (Brassell and Boschmans, 2019[7]).

The lending products (or transaction types) that feature active consideration of intangible assets, and which involve the use of a security interest, can be divided into four broad categories. These are represented below as a flow chart, based on the degree of confidence with which a disposal value can be estimated by a lender or an intermediary acting on their behalf.

Figure 3.3. Types of lending that may involve use of intangible assets as security



Source: Authors

The first option concerns assets which are already generating market value independently of the individual or entity which originally created them. Examples include a successful catalogue of published music or selection of recorded works, which are protectable under copyright, or a family of patents which are 'standards essential' (i.e. anyone wishing to incorporate use of an industry standard within a product has to obtain a licence to use them). If future royalty streams can be estimated with sufficient confidence, they can be given a net present value which can be used as a basis for a loan or issuing a security.

While individual assets of this kind may not generate enough income to make securitisation worthwhile, portfolios of similar/related assets are suitable for this type of financial instrument. The most famous example (because it was one of the first) was the 'Bowie Bond', developed by David Pullman using the future royalty rights to 25 albums recorded by David Bowie which was securitised over a 10-year period and raised USD 55 million in 1997 (Financial Times, 2016[39]) .

IP securitisation was examined in a 2016 European Commission workshop (Dinnetz, 2016[40])(Whilst acknowledging the substantial potential to stimulate innovation and improve intangible asset liquidity through the use of new financial instruments, participants identified a number of challenges around the absence of public sector guarantors (in Europe), asset valuation, asset quality and the absence of suitable exchange structures.

The vast majority of intangible assets cannot meet this first test, because the value they deliver is wholly (or primarily) realised through sales of products or services that embody or rely on them. The second option is available if these assets are of a quality that they would have recoverable value even if the business that currently exploits them were to cease trading. Assets that qualify can be used as collateral in much the same way as a tangible asset (though as already noted, no capital relief will be available to the lender against their value).

The third option may become relevant where a lender is unwilling or unable to rely on a realisable collateral value for a given set of business intangibles, but is nevertheless able to recognise that the assets still represent a source of business value which may serve as a useful behavioural influencer. Information on the intangibles may also help a lender in its analysis of apparent weaknesses in the prospective borrower's balance sheet (as these may be the result of inability, or failure, to capitalise relevant investment).

If this lender is a general commercial bank, it may scrutinise the assets' identity, importance and value and use these enhance its security "wrapper" (for example, by being able to take more effective fixed and floating charges); if it is an asset-backed lender, it may adapt a sale and leaseback agreement into a sale and licence-back. The advantage this latter structure offers is that it means the financier already has title to the assets; it does not need to exercise a security interest in the event of a default, because it already has an ownership interest. Since this is not collateral as such, it is shaded differently in the accompanying diagram.

The fourth option, venture debt, may be of relevance if the usual criteria for a loan that is otherwise unsecured (i.e. cash flows that demonstrate debt serviceability and a suitable balance sheet) are not met. This is typically the case where a business is pre-revenue or early stage. Under these circumstances, a number of lenders and specialist funds may nevertheless be willing to provide debt facilities if the SME has robust equity investment backing and has strong exit (i.e. business sale) potential. Debt is usually put in alongside equity in order to help a company reach a specific investment milestone without diluting the management team or existing investors; security is taken over the IP and intangibles of the business as a mechanism to protect the lender against default, though in this instance, the expectation is that the debt will be repaid by the equity investors rather than by the sale of the assets themselves.

Of all these approaches that are present in the market (to varying degrees), the second is the main area for policy attention. This is because it overcomes a structural market failure (SME's absence of tangible collateral) and provides an effective way to direct the flow of capital towards businesses that are more likely to innovate and grow (because the presence of these assets is associated with historical innovation).

Lenders lack confidence in the recoverable value of intangibles because IP (and related intangibles) is an unfamiliar asset class; specialist knowledge is required to assess, value and sell it. Policy interventions have experimented with a number of ways to address these gaps and obstacles. The most common approaches are the provision of 'backstop' guarantees of recoverable value; systems/regulations and cost subsidies governing IP and intangibles assessment and valuation; interest rate subsidies for IP and intangibles-owning businesses; and/or the management of dedicated funds.

A policy focus on harnessing intangible value may be justified using a number of arguments. Two that are well documented are that intangibles intensity signals an innovative company that will grow more strongly (see Box 3.1 following), and that the growth of such companies is impeded by the finance market failure that arises from the absence of other forms of collateral in such enterprises (discussed above).

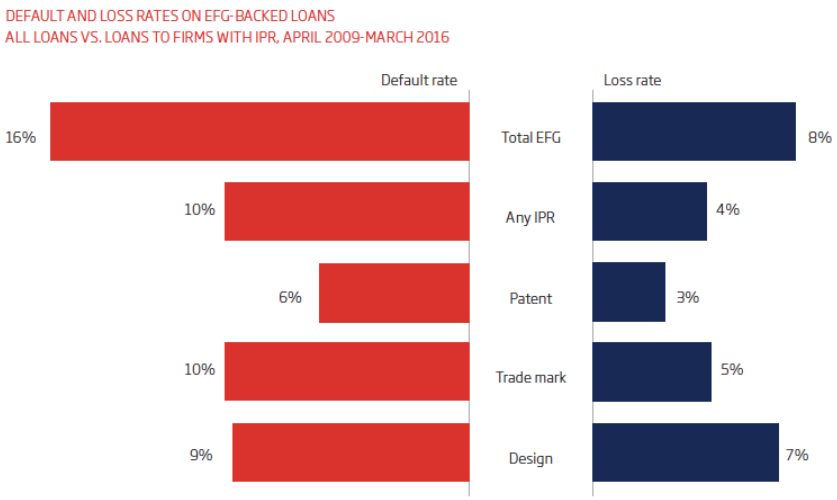
Other arguments relate to (1) what might be termed the 'signalling' function of intangibles for commercial credit purposes (rather than grants or subsidies); and (2) the genuine prospect of predictable recoverable value. Each of these is briefly examined below.

Intangible assets and loan performance, loss rates and recoveries

There is evidence to suggest IP rights and other types of intangible assets are indeed predictive of better credit performance and that losses are reduced when they are present (other factors being equal). This question was directly considered in a recent UK government report (British Business Bank/Intellectual Property Office, 2018[41]) () which set out the results of a study of loans conducted using its Enterprise Finance Guarantee (EFG) scheme which is specifically designed for SMEs lacking tangible asset collateral. This exercise looked at rates of default (the value of agreements that were initially reported as being overdue) and rates of loss (the amount ultimately claimed against the guarantee because it was unrecoverable).

After matching applicants against statutory IP rights databases, the study found that the default rate of 16% across the whole portfolio was reduced to 10% in cases where any registered IP rights were present, and to 6% where granted or pending UK or European patents were held. It also showed that losses, normally running at 8%, were halved on average when any IP rights were present (this effect was again strongest with patents, though there was a positive effect across all types of registered rights).

Figure 3.4. Default and loss rates on EFG-backed loans, United Kingdom, 2018



Source: Using Intellectual Property to Access Growth Funding, BBB/IPO, 2018

This study does not prove that the difference in default and loss is directly attributable to the IP rights themselves. It is also limited to an analysis of registered rights, which is a small subset of the intangible assets the SMEs taking out EFG loans are likely to have held. However, the improvement observed in terms of loss reduction suggests that businesses with IP (and their stakeholders) are more determined not to lose control of it as a result of a loan default.

A 2017 study examining the outcomes of US venture debt lending over 2004-2014 indicates a similar effect, i.e. that the importance of the assets being secured tends to reduce default rates. Venture debt lenders are accustomed to taking intellectual property rights as primary collateral; either patents or trademarks (or both) were present in over 80% of the loans that were examined. The study found that debt of this kind, which is often borrowed in order to assist a company to achieve valuation milestones more quickly and non-delusively, tends to be repaid quickly - on average, over 40% each year (Gonzalez-Uribe and Mann, 2017[42]).

Default rates on this analysis of 30 000 loans (total value USD 1.4 billion) are estimated to be surprisingly low, at around 2% of invested capital. This low level of loss is attributed to the implicit commitment made

by the company's associated equity investors to refinance venture debt should the need arise, in order to preserve control over the assets of value that have been used as security. The improved performance may also have been partly attributable to the lender practice of taking warrants, which may have discouraged them from initiating foreclosure proceedings.

Default rates related to intangibles lending have been published by Korean credit guarantee organisation KOTEC (locally: KIBO). The organisation specialises in supporting innovative SMEs with new technologies; whilst it is not an IP financing programme as such, most of the companies it supports have identifiable intellectual property assets which are rated as part of the process of evaluating firm suitability for support using its proprietary technology rating system, KTRS (summarised in (European Investment Bank, 2018[43]).

Whilst companies with a very high rating are unlikely to require a guarantee (because they are already creditworthy) and companies with the lowest rating will be ineligible for a guarantee (because they are insufficiently creditworthy), KOTEC nonetheless issues a high volume of guarantees. Its balance of outstanding guarantees at end 2018 (equivalent to approximately EUR 17bn) showed a leverage ratio (guarantee balance vs. underlying assets) of 13.4:1 (2009: 6.4:1).

KOTEC publishes high-level summary data on its default and recovery rates. These have been relatively consistent over the period of 2009-2018, ranging from 4% to 5% by value each year (averaging 4.5%). For the six years between 2013 and 2018, the amounts recovered in each year equated to between 24% and 32% by value of the defaults registered in that year. Before accounting for timing differences, this suggests that the loss given default (LGD) experienced from this activity is in the region of 2.7% - 3.8%.

Although it is important to stress that the financing structure gives KOTEC a right to recover against all the company's assets, not just its patents and other intellectual property, the fact that the assets which form the basis of its scoring approach are largely intangible is of clear relevance in interpreting these outcomes.

Intangible assets and redeployment

Another way in which intangible assets can play a role in improving access to finance is by offering the potential for redeployment. This is an important property of tangible asset collateral, and there is evidence to suggest that intangibles can exhibit similar properties, though the research literature is somewhat focused on IP rights, and patents in particular, owing to the rich dataset these provide.

Granted patents are confirmed to perform an important signalling role in alleviating the information asymmetries present in the market for entrepreneurial capital and are associated with faster sales growth and better floatation prospects among start-ups, which are all positive characteristics for financiers (Farre-Mensa, Hedge and Ljungqvist, 2016[44])(Also, though often thought of as illiquid assets, there is sufficiently 'thick' patent trading in the US (especially where data suggests these rights are not firm-specific) to have a measurable impact on access to finance. Their presence encourages informed investors to support risky projects (Hochber, Serrano and Ziedonis, 2016[45])

The question of patent redeployability has been the subject of recent examination (Serrano and Ziedonis, 2018[46]). A 10-year period of subsequent sales activity was analysed for 1 766 US patent assets originally owned by 285 venture capital-backed start-ups, founded between 1987 and 1999 and failing between 1988 and 2008. The sample was drawn from three high technology areas (medical devices, semiconductors and software).

This study found that the majority of patents – nearly 70% by volume - were sold within a year of business failure (semiconductors, 87%: software, 74%: medical devices, 61%). They were generally bought by other operating companies in the same sector, and evidence of their ongoing renewal can be interpreted as proof that they have retained value beyond the original venture. Some cases were observed where the transfer involved people as well as patents, but analysis of LinkedIn and inventor records indicates that 80-87% of all inventors move on to an organisation other than the one which purchases the patents.

These findings run counter to the commonly expressed view that patents held by start-ups are of no value without the accompanying management team. It further suggests that while the market for patents is not transparent, it is nonetheless active - at least in the United States, where the heightened level of patent litigation activity may provide an additional incentive for corporations to aggregate IP rights that strengthen their portfolio in areas of special interest for defensive, and sometimes offensive, purposes. It is particularly important in the case of start-up businesses, as other research indicates that these companies are amongst the most prolific patent applicants, but have a high failure rate: 55% of all start-ups that received venture capital between 1985 and 2009 were terminated at a loss (Kerr, Nanda and Rhodes-Kropf, 2014[47])(

Another interesting conclusion (proposed by (de Rassenfosse and Fischer, 2016[52])) is that the United States practice of requiring patents to be pledged as collateral has created an additional incentive for financiers to seek to recover value and that some consideration of the saleability of the assets (as well as the exit potential of the business if it succeeds) is already informing their lending decisions. This aspect is considered further through the case studies set out in the following chapter.

Box 3.1. Other signalling functions of intangible assets

There is a large body of evidence indicating a relationship between innovative activities and investment in intangible assets (for example, (European Investment Bank, 2019[48])). Intangibles-rich entities are frequently associated with stronger business performance, whether measured by sales growth, total factor productivity, labour productivity or innovativeness. Thus for policymakers, the presence of a range of intangible assets provides a means of identifying companies whose economic contribution is likely to be greater than average and may therefore justify additional investment in support.

A further benefit to lenders may be enhanced rates of business survival for intangibles-rich entities, evident even in the presence of financial shocks. Use of market value added (MVA) analysis suggests that companies with any intangibles-intensive strategy outperformed others during the last financial crisis (Barajas, Shakina and Fernández-Jardón, 2017[49]): however, simply spending more on R&D appears to have led to a worse return, suggesting the need for detailed analysis of the actual intangibles and their use.

Greater propensity to grow is of particular interest to policymakers, and is also advantageous to lenders because it improves debt serviceability. A recent report (EPO/EUIPO, 2019[50])concludes that SMEs with at least one registrable intellectual property right are 21% more likely to grow and 10% more likely to become a high growth firm (defined as having an average employment growth rate of 10% or more over three years). If the IP rights are European in scope, the probability of subsequent high growth increases to 17%. Whilst not a causal relationship, patents are shown to be especially predictive of high growth (for both technology-based and lower-technology companies), although the strongest correlation with high growth exists where all three types of IP rights (patents, designs and trademarks) are present.

The most recent report published (EPO/EUIPO, 2021[51]) chose to measure the relationship between IP and growth in a slightly different way, focusing on revenue per employee. This concluded that firms that own IP rights have on average 20% higher revenue per employee than firms that do not. More importantly, the effect was particularly pronounced among SMEs, where the average difference in revenue (across a range of European countries) was 68%.

Patent sales may in fact be higher, as the fact of a sale has to be confirmed by reference to an entry in the USPTO patent assignment records which may not be entered in a timely fashion, or at all (it is sometimes in the interests of non-practising entities to delay information on their patent purchases entering the public domain). Other research into changes in ownership (Akcigit, Celik and Greenwood, 2016[53]) indicates that

20% of all US patents issued between 1976 and 2006 transact through the secondary patent market, often to companies that own patent rights in related areas.

Issues impeding more regular use of IP and intangibles as collateral

While intellectual property rights, and patents in particular, are relevant for start-ups, high growth enterprises and innovative enterprises, there are a number of difficulties in collateralising movable intangible assets (Brassell and Boschmans, 2019[7]). These difficulties have prompted policy interventions in various international contexts.

Revisiting the regulatory position (i.e. the absence of capital relief on intangibles) is theoretically one policy option. However, this is difficult to address unless more data from actual financing activity can be made available to inform the debate. Without this, lenders cannot accumulate evidence to underpin assumptions about key ratios (propensity to default, exposure at default and loss given default). The policy focus has therefore tended to be on addressing the practical difficulties faced by financiers in dealing with a new and unfamiliar asset class which does not offer the advantage of being regularly traded on transparent markets.

These start with the need for financiers to be able to identify an SME's intangibles. This is not straightforward because SMEs are unlikely to maintain an inventory of these heterogeneous assets are or any record of their worth, and neither identity nor value can be obtained from examination of the company's accounts. They may even lack the knowledge and language to describe what all of their intangibles are. It is also not always the case that a company owns, and is therefore authorised to enter into a security agreement for, the intangibles it uses, as these may be licensed-in from a third party.

Having identified the assets and confirmed their provenance (to the extent reasonably possible), a lender must then understand the contribution a particular set of intangibles makes to the company seeking finance, and assess the risks associated with the assets in their business context. If the lender is to utilise the assets as security, it also needs to settle on a value for them.

Lenders often use specialist appraisers to determine a value to be placed on forms of property offered as security (e.g. physical assets). The unfamiliarity of intangibles as an asset class increases the need for, and degree of reliance on, external scrutiny of this nature. All of this activity increases the time and expense involved in arranging an intangibles-backed loan, and the direct costs need to be passed on for the deal to remain viable for the lender. For this reason, IP-backed finance transaction costs tend to be high, to the extent that the effort and expense of the necessary analysis may render financing uncompetitive and/or unaffordable for the companies that would otherwise stand to benefit most from it.

The second overall issue, lack of lender confidence in recoverable asset value, arises from the perception that IP and intangibles are generally so firm-specific that they are unlikely to be worth anything in the event of business failure. For there to be a recovery value, the financier must first be confident that an effective security interest can be obtained over the assets; then, that the theoretical value which has been attributed to the intangible assets still be realisable in the event of a default.

The research referenced above show that recoverable value can be present. However, intangibles derive their value from being heterogeneous, unique assets rather than commodities. They are often internally-generated and firm-specific, and generally bought and sold together with the business that has created them. For these reasons, predicting the amount of realisable value (if any) that these assets will have in a 'gone' concern is difficult (which in turn adds to the cost and complexity of the assessment process). In addition the process of realising value following a loan default is more complicated than with other classes of asset, often requiring the use of specialist brokerage services.

Chapter 4 sets out examples of public and private sector initiatives to address these issues and their outcomes.

4. Selected intangibles financing case studies

One way in which state support may be offered to companies seeking to invest in intangible assets but lacking the forms of collateral preferred by lenders (i.e. immovables) is to provide a government guarantee. As well as individual national schemes, these credit guarantees are sometimes provided by international organisations, such as the European Union and European Investment Fund; this periodically publishes research on the business uses to which these guaranteed loans are put, recent highlights of which are reproduced below.

Responses to a survey initiated for this study, also summarised below, indicate that this remains the most widespread policy approach to the shortage of collateral.

Nevertheless, a number of countries have decided that more specific and targeted measures are needed to facilitate intangible investment and access to finance more generally. This chapter examines five contexts in which intangible assets have been harnessed to compensate for the absence of immovable asset collateral in SMEs. The first four contexts relate directly to State-backed initiatives, starting with the longest-established programmes (China), then examining Korea and Singapore, and concluding with the most recent activity from Canada.

The final case study concerns the United States, which does not involve direct government backing to collateralise intangible assets, but where market-led initiatives have developed in recent years. This acts as a useful point of comparison, though it may be helpful to bear in mind that US markets for intellectual property (particularly patents) are more highly developed and liquid than in most other countries.

The elevated level of market activity observable in the United States may be accounted for in part by greater litigation activity. Whilst litigation provides a potentially powerful incentive for companies to augment their IP rights portfolios, it also increases the risk that the use of IP will be challenged on grounds of infringement or invalidity. The need to manage this form of risk has prompted innovation in insurance, which is of wider international relevance.

Support for firms lacking tangible asset collateral via general credit guarantees

While they do not provide support specifically for intangibles-backed financing, credit guarantees are one of the primary instruments used to support SMEs that lack tangible asset collateral, and have been one of the main policy responses to the COVID-19 pandemic. These schemes have existed in various forms across the majority of developing countries since the 1980s (OECD, 2013[54]) and their use was scaled up significantly during the global financial crisis in 2008.

Since 1998 the European Union (via the European Investment Fund) has guaranteed over EUR 50bn in loans via programmes such as “G&E”, “MAP”, “CIP”, “COSME” and “InnovFin”. An assessment of the latter two schemes, based in part on data from their predecessors, has recently been published (Ratkovski, Signore and Stoychev, 2020[55]).

Of these two schemes, the experience of the InnovFin SME Guarantee Facility appears most relevant for consideration of intangibles as it is directed towards individual businesses (rather than more homogeneous loan portfolios) that can demonstrate innovative capacity in some way (via a series of tests, though none of these extend to scrutiny of the intangibles themselves). These businesses bear the cost of a modest fee for access to the guarantee.

EIF reports that InnovFin has been oversubscribed by qualifying lenders, with 184 financial intermediaries participating (70% of which are commercial banks and leasing companies: a further 20% are guarantee and promotional institutions). The beneficiaries are mostly SMEs rather than micro businesses, accounting for 59% of the 23,000 companies funded from 2014-19.

Financing totalled EUR 14.8 billion (an average ticket size of c. EUR 476 000), most of it in loans with initial maturity periods of five or more years. Most of the capital represented by these loans (over 70% of the total financing provided) was invested by businesses in new or substantially improved products, processes or services; EIF's assessment indicates that around 45% of these investments contained an intangible element.

Box 4.1. Survey responses to IP-specific guarantee products in Europe

As well as regional interventions, countries may provide their own schemes. A short OECD survey conducted for this study with selected European national organisations responsible for the provision of financial guarantees confirmed that several countries currently provide guarantee products that is not targeted towards IP specifically, but have explored that avenue in the recent past.

Austria (AWS), which has its own published standards for the valuation of certain types of intellectual property assets, reported that it has in the past considered offering a special programme for intangibles. It has gone as far as setting up a pilot programme under which a small number of loans secured against intangible assets were made. The reason stated for the failure of the programme to gain more traction was the inability of the banks to determine a suitable collateral value for the intangible assets. The country has reverted to offering a guarantee which addresses the absence of collateral in general.

Luxembourg (MPME) advised that it focuses its specialist schemes on providing support to start-up enterprises and sees that intangible assets are covered wholly or partly by its standard products; it rarely participates in transactions that need to take account of any special regulatory framework. It is aware that the value of intangible assets can be a contentious matter in discussion of enterprise value, singling out goodwill. Luxembourg deals with this challenge by fixing a maximum amount of goodwill that can be covered by its guarantee product.

Germany (VDB) agreed with the Luxembourg view that intangibles financing was compatible with standard programmes but that goodwill valuation represented a challenge in the case of acquisition finance. Similarly, Belgium (PMV) advised that intangibles financing would be covered by its general guarantee programme.

In Eastern Europe, responses were received from Hungary (Guarantiqa) and Romania (Contragarantare). Hungary confirmed that there was no dedicated programme for intangibles financing, indicating that these assets can be guaranteed in its "business as usual" process by taking a pledge, but that consideration of them was rare. Romania did not consider that its guarantees were particularly applicable to intangibles financing.

In terms of loan impact and performance, studies of the predecessor MAP and CIP programmes (Asdrubali and Signore, 2015[56]; Bertoni, Colombo and Quas, 2018[57]; Bertoni et al., 2019[58]; Brault and Signore, 2019[59])) concluded that firms supported with EIF-guaranteed loans were around one-third less likely to go bankrupt on average (up to 50% less likely in some countries). Also, following the provision of credit guarantee support, the ratio of intangible assets to total assets, used as a proxy for the amount of innovation in firms' business models, increased by one-third.

In the absence of bank pressure to provide specific support for IP and intangible-backed finance, these general credit guarantees may appear adequate. They have the advantage that checks on eligibility are relatively straightforward to conduct. They are, however, open to the criticism that by compensating for existing lender preferences for immovable forms of collateral, they are perpetuating a dependency that is increasingly unviable for knowledge-based enterprises. In addition, it may be argued that such measures are not sufficiently targeted towards businesses that can have a greater positive impact on innovation and growth (and which are more likely to export and be sustainable in the longer term).

The states which have engaged publicly with IP and intangibles financing have done so as part of a policy approach designed to encourage and reward knowledge-based enterprises. In all cases, their primary focus is on SMEs.

State-backed intangibles financing schemes: China's policy approach

China has experimented significantly with IP-backed financing schemes, both at the national and regional level

China has a history of demonstrating its commitment to encouraging innovation and competitiveness through the use of patent filing subsidies; these have led to the country filing more patents than any other. The positive consequence of this activity is that there is a substantial 'stockpile' of patents and other IP assets which can be used for IP-backed financing; even though many of these subsidies have now been withdrawn, levels of patenting appear unlikely to return to pre-incentivised levels.

China is the country which first engaged with IP financing at scale, and it currently accounts for the largest total and annual amount of state-supported IP-backed finance. The first reported loan to incorporate assessment of IP was made by the Beijing branch of Bank of Communications in November 2006, in which year it was also reported that a dedicated fund of more than RMB 100 million had been established in Shanghai to provide guarantees for loans to high-technology firms based on their IP assets and goodwill. Many regions still focus their interventions on companies with state-recognised high technology status.

There are many local and regional variations in the ways in which IP-backed finance is supported and facilitated. However, as well as encouraging localised implementation, national governmental organisations clearly also play an important role in building confidence in IP as an asset class. These are influential at a number of levels. While the Ministry of Finance plays a role, CNIPA and CBIR (the China Banking and Insurance Regulatory Commission), are the two most important agencies which refine the mechanisms used for IP pledge loans and encourage risk sharing through a range of mechanisms, including guarantees and insurance. CNIPA has a specific department responsible for IP utilisation and has established a public-private commission which includes a Financial Service Expert Committee responsible for policy development on IP backed finance.

At a national level, a series of Notices and Opinions have set the scene for the ways in which IP-backed financing should be used to support the development of SMEs through the engagement of commercial banks. This includes a recent announcement in August 2019, which set out the desirability of separate credit programmes and specific in-house performance appraisal and incentive mechanisms to support IP

pledge financing. According to reports in Chinese media, this includes some tolerance for slightly higher than normal bad debt ratios (Global Times, 2019[60]).

The primary (but not sole) focus of Chinese schemes has been on patents, though trademarks and copyrights have also been utilised in some cases. A range of lenders are, or have been, engaged in lending against these assets.

Taking Shanghai as an example, at least seven different banks have played a role in recent years. They include Shanghai Pudong Development Bank, Shanghai Huarui Bank (with an emphasis on technology start-ups), China Merchant Bank (via a specialist guarantee agency), Shanghai Rural Commercial Bank (issuing a small number of patent pledge loans backed by guarantee), Bank of China (including loans to cultural SMEs using copyright assets and receivables), Bank of Beijing (with and without the involvement of guarantee companies) and HSBC (mostly through specialised asset finance products). A news article in November 2019 (Why.com., 2019[61]) confirmed that ten Shanghai bank branches had agreed specific measures to co-operate on IP pledge financing and signed a strategic co-operation agreement at China Patent Week.

Policies are generally aimed at mitigating credit risks for lenders and lowering transaction costs for borrowers

Lenders and guarantors operating in China are conscious of the elevated risks in SME lending (compared with larger businesses) and will make an assessment on whether to provide finance based on the overall creditworthiness of the applicant, which includes a requirement for a degree of market traction. In the absence of stable revenue streams, they are likely to decline to make an advance. In terms of the IP itself, they exercise a cautious approach to IP as an asset class; usually insist on additional forms of security; advance relatively modest loan amounts; and use comparatively low loan to value ratios.

Available subsidies are generally made available to the borrower. However, a range of measures have been implemented to build lender confidence in the realisable value of intangible assets taken as security. Firstly, in many regions, lenders are able to take advantage of guarantees. Some models (seen in Wuhan, Guangdong, Shenzhen and other provinces) involves a patent-owning company pledging its IP to a specialist guarantee company, which then provides its guarantee to the lender. Secondly, a regional government may establish a dedicated guarantee or risk compensation fund which then provides the lender with an indemnity. This has been used in Shanghai, Sichuan and Chengdu, as examples.

These two approaches are not necessarily mutually exclusive: there has been an example in Fuji of a risk compensation fund in which the government partnered with specialist providers to compensate the lending bank in the event of an unrecoverable default. There are also some examples emerging of insurance-backed solutions to address lending risk (e.g. in Shenzhen), though this area is wholly state-backed and still in its infancy, and the level of protection offered by current policies does not cover all risks.

Borrower subsidies address one of the well-understood issues with IP financing, namely the high transaction costs. The combination of bank interest rates, appraiser fees and guarantee fees may raise the overall financing cost to the company to levels of 8-12% of loan value (of which the bank interest element may be only 5%). If unaddressed, this might make the use of IP as collateral offputtingly expensive (Finance Sina, 2020[62]) .

Regional and local support typically takes the form of subsidies for the cost of IP appraisal and/or loan guarantee, where provided. Support may also extend to interest rate subsidies or rebates in order to offset the additional costs of borrowing using IP as collateral. The borrower, rather than the lender, is the main focus for these measures.

Chinese SMEs seeking IP finance may be eligible for a range of subsidies. 50%-70% of the cost of the appraisal and the loan guarantee is reclaimable in Shenzhen. In Nanshan, a typical reclaimable figure is 70%, and in Guangzhou, the evaluation and guarantee/insurance costs are 100% reimbursed.

In terms of interest rate subsidies, the Wuhan scheme reimburses 50% of the interest paid by the borrower if their loan is repaid in full and on time. In Guangzhou, 3% of the loan amount is available as a rebate in order to offset the interest costs. This appears to translate into a total cost of financing to the SME of between 1% and 3%, making these very affordable loans, though as noted above they generally have to be repaid over a short period.

Valuation is conducted by licensed firms, who charge a percentage of the loan amount

IP valuation in China is regulated and led by CNIPA and the China Appraisal Society, which have been responsible for publishing a range of standards and guidance. In some contexts, such as when seeking to determine the amount of share capital that should be issued against the value of assets contributed to a new venture, use of a licensed valuer is mandatory. To become licensed, firms are required to exhibit minimum standards of competency and experience.

In terms of the methodologies used, published articles indicate that while cost, market and income methods may all be employed, assessment of IP and intangible asset value based on the income approach is increasingly favoured (though cost methods may still have relevance for start-up businesses). Lenders may nominate the appraiser to be used and will often engage in direct dialogue with them regarding the marketable value of the IP assets, taking into account the contribution made to operating income (which is the reference value) and the potential liquidation value should the enterprise fail. This dynamic will be different where the lender is placing reliance on a guarantee company.

There is no set loan to value (LTV) ratio used when appraising IP and intangibles. Soundings indicate that the LTV (based on the reference value as described above) is generally in the region of 20-30%, but recent press information suggest that Shanghai lenders have been prepared to consider up to 40%, and there are other examples ranging up to 70% in areas where the risk sharing arrangements are sufficiently generous to permit it.

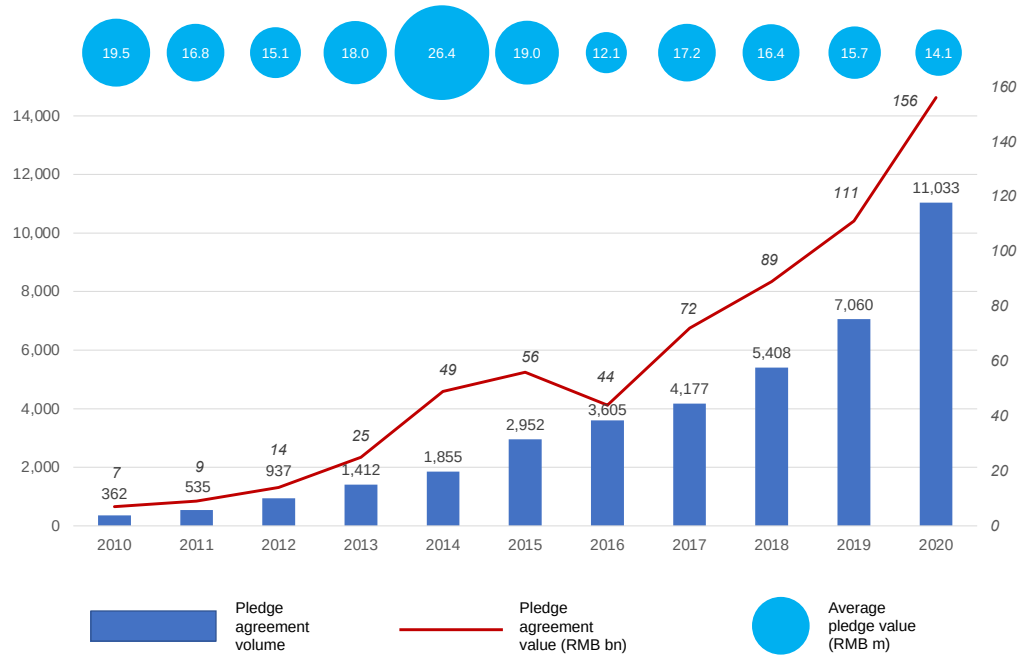
The charges for the appraisal process typically range from 1%-2% of the loan amount. The IP appraiser seldom participates directly in risk sharing, but there have been exceptions. Where appraisers do take on a ‘strip’ of risk, this is generally made possible by professional indemnity-style insurance policies. The insurers providing this form of cover are primarily state-backed.

Activities have accelerated in recent years, but may require additional tangible collateral to be available

The analysis that follows is based on official statistical sources and on interviews conducted in 2019 and 2020 with local government agencies, business support providers, lenders, appraisers and guarantee companies.

Owing to actively pursuing a policy to encourage companies to file patents, China starts from having a larger proportion of IP-owning companies that may benefit from IP-backed financing than other States. The negative consequence, which has been the subject of comment in Chinese journals, is that the quality of the IP rights is variable, with ‘knock-on’ effects for the prospects of successful disposal in the event of a loan default. This, in turn, affects lender confidence in the asset class, especially as banks lack the skills to distinguish between high and low quality patents.

Figure 4.1. Growth in recorded patent pledge financing in China



Source: CNIPA; Chinese government agency sources.

The number and profile of loans which involved pledges against patents are shown in Figure 4.1. It shows that the amount lent increased in each year from 2010-2019, apart from 2016 (even in that year, the number of pledge financing deals recorded still grew). In recent years, as volumes have risen, average pledge values have fallen, indicating use with a higher proportion of smaller loans.

The 2020 level of lending, RMB 156 billion, is equivalent to over EUR 21.5 billion at current exchange rates. This is already substantially higher than any other country; however, in its National Intellectual Property Strategy published in 2017, CNIPA (China National Intellectual Property Administration, formerly SIPO, the State Intellectual Property Office) set out an aspiration for annual patent pledge financing to reach RMB 180 billion (approximately EUR 25 billion) over a five-year period.

Despite these high levels of activity, and widespread bank engagement (encouraged by the use of targets and incentives), measures taken to date are yet to change long-standing lender preferences in a decisive manner. While a few loans have been publicised which only involve security over intellectual property rights (one 2019 example involved a Bank of China loan in Heyuan, Guangdong Province) (Heyuan, 2019[63]) , it remains rare for these to be the exclusive form of security taken by the lender. A common approach is to take an additional pledge or mortgage involving tangible assets such as physical property (buildings), incorporation of security interests against accounts receivable, and/or an equity pledge.

One of the reasons for this may be the structure of the guarantees available, though again, there are regional variations. In Wuhan, guarantees will typically cover only 40% of the loan: in Guangzhou, the limit is 30%, paid out of an RMB 10m pool: only one scheme identified, in Nanshan, offers 100% coverage. There may also be caps imposed on the permitted level of default across a portfolio. As a result, the actual level of transfer of lending risk is regarded by lenders as low, and they remain cautious about engaging with IP and intangibles as an asset class.

Concerns remain regarding small firm take-up and recovery management

Independent commentators have questioned the extent to which small businesses are benefiting from the programmes. At the macro level, it is difficult to reconcile the average loan size of RMB 15.7 million (EUR 2 million) suggested by published statistics with the data from regions which indicates that loans of RMB 3-5 million (approximately EUR 400 000 – 600 000) are the norm for SME most applicants. This figure is more consistent with normal debt serviceability requirements, especially when the typically short tenor of the IP-backed loans (sometimes only 1 year) is taken into account.

The limited information on default rates that has been made public (Finance Sina, 2020[62]) suggests that concerns over default rates may be legitimate. In 2019, the non-performing rate of Beijing's IP pledge financing was stated to be around 5%, compared with a general rate for general loans of 0.5%. However, other reports and interviews generally indicate that low default rates have been experienced by the majority of lenders, with few examples of more than a handful of default rates being experienced (some guarantors report seeing no defaults at all).

The low default rate means that the volume of assets being traded following default is also very low, yielding insufficient data to build confidence in recoverable value. Neither lenders nor valuers have accumulated experience of managing intangible asset recoveries in the event of default; the typical route followed by a lender when obtaining assets as a result of default is to auction them. A number of marketplaces (including Alibaba's Taobao platform) support this activity and are seeing an increased volume of patent trading as supply from liquidated companies increases (though this is not directly attributable to financial defaults).

Greater use now being made of transparent marketplaces is a positive step in demonstrating that IP assets can have recoverable value even after the company that created them has ceased to exist. There have also been publicised cases of substantial prices being realised at auction. However, some scepticism remains regarding whether Chinese patent assets (and in particular, utility models) generally have much recoverable value when separated from the company that filed them, and assets often remain unsold as a result of auction listings.

While a low default rate might, under other circumstances, be regarded as a positive indicator of IP loan quality, interviews suggest doubts over underlying recoverable intangible value remains high *because* of the lack of any experience to the contrary. The value of measures to underpin intangible asset value can only be appreciated when defaults and potential losses actually occur – an important policy point.

The intangible asset valuation process also appears to face some challenges. As well as issues of cost, time and complexity (which most regions have sought to address by offering subsidies), there are questions regarding quality and impartiality. Whilst valuers for IP financing deals are selected by banks, there frequently appears to be more 'negotiation' between the valuer, lender and borrower than is consistent with an objective and well-evidenced value determination process.

State-backed intangibles financing schemes: Korea's approach

Intangibles-backed finance is facilitated alongside technology finance

Government involvement in intangibles-backed lending began in Korea in 2013. It became possible following the enactment of the Security over Movable Property, Claims, etc. Act in 2012, which made the creation of a pledge possible – a specific example of the need for enabling legislation to be passed. Historically, activity has been focused on intellectual property assets (particularly patents) and has been led by two state-owned banks, Korea Development Bank (KDB) and Industrial Bank of Korea (IBK) (Brassell and Boschmans, 2019[7]).

Recognition of the collateral value of intellectual property rights is regarded as a separate activity from technology finance, which is well-established in Korea. Technology finance works by replacing a conventional credit rating with a technology rating (which also takes default risk into account), and is overseen by the Financial Services Commission of Korea (FSC). It generally involves a pledge over all the company's assets (not just those that are technology-related).

Where the company's technology assets are deemed to be of very high quality and the insolvency risk is assessed as very low, a certificate may be issued. Where the quality is somewhat less certain, but the evaluation is successful, a guarantee (which is typically between 85% and 100% of the value determined by the technology rating process) is provided in favour of the financial institution making the loan.

This approach is regarded as better suited to reduce information asymmetry and uncertainty. This activity is overseen by the Korean Intellectual Property Office (KIPO) with activities such as development and promotion of IP valuation tools and valuer accreditation overseen by its subsidiary, the Korea Invention Promotion Association (KIPA).

Both types of finance (technology or IP) may require a guarantee to be provided. These are the same sources for both types of finance; they will generally be provided by the Korea Technology Finance Corporation, KOTEC (also known as KIBO) or the larger Korea Credit Guarantee Fund known as KODIT. KOTEC differs from KODIT principally in its emphasis on innovative SMEs and the evaluation of their technology. At its establishment, KOTEC's initial emphasis was on manufacturing technologies (machinery, automotive, electronics and chemicals) but its emphasis has spread to cover ICT, life sciences, pharmaceuticals and creative arts. In total KOTEC has information from approximately 700 000 evaluations it has conducted across approximately 80 000 customer companies.

While technology finance credit rating will be done by one of five Tech Credit Bureau institutions, IP valuation is done by invention evaluation agencies, of which 18 were operative at the end of 2018. In order to assist banks and other institutions to ascertain patents that may have value, KIPA has developed a 'Smart 3' tool which it encourages lenders to use where company portfolios include US and European patent rights. This does not place a financial value on the assets but rather produces an AAA-C rating (akin to a credit reference agency report).

The standard method of financial valuation used in Korea is the 'relief from royalty' method, with the royalty rates drawn from technology transfer databases. Subject to pre-approval, subsidies are also available from KIPO for the cost of a valuation process, typically covering up to 50% of costs in the case of a bank loan (higher subsidies are provided for other specified purposes).

Separately from its technology evaluations, KOTEC also has specific programmes to support R&D activity (mainly to help fund internal development, but also to fund acquisition of IP from research institutes/other parties). These separate forms of guarantee have been available since 2006: in 2018 a total of 4,514 cases were reviewed with a cumulative value of around EUR 700 million.

Korea also offers a further source of company loan guarantee via regional Credit Guarantee Foundations. These organisations receive financial contributions from a number of sources (central and municipal governments, local financial companies and entrepreneurs); their membership of a Federation provides a 're-guarantee' to ensure liquidity.

Policy outcomes have been critically reviewed and updated

A series of new policy measures to improve uptake of IP finance have been announced by Korea in the recent past. The information in this section is based on official public statements and published reports from Korean government institutions in December 2018 and April 2019 and interviews held during April and October 2019. It represents a rich source of data on what the State perceives needs to be done in order to make IP-backed lending more attractive to banks and borrowers.

Korea's announcement in December 2018 (FSC & KIPO, 2018[64]) was jointly issued by FSC and KIPO. While recognising that the amount of finance (particularly leveraging patents) was steadily increasing, it observed that progress was not sufficient and set new and specific targets for increased lending (to KRW 2 trillion, from KRW 450 billion in 2018); for the number of loans (from 654 in 2017 and 741 in 2018 to 2 960 by 2022); and for the rate of patent utilisation for this purpose (from 1.4% in 2017 to 8% in 2022).

Among the challenges in intangibles financing, the Announcement highlighted the intrinsic risks of intangible assets; their immaturity in trading markets (leading to uncertainty regarding recoverable value); shortcomings in investment techniques (including insufficient success stories to attract funds); the high cost of IP valuation and the insufficiently objective criteria applied; and inadequacies in the legal infrastructure (in essence, the difficulty of establishing effective security interests). It concluded that further financial 'activation measures' were needed to contribute to the growth of innovation and effectiveness of IP commercialisation, specifically by targeting companies with insufficient physical security but high technology.

The wording of Korea's statements makes it clear that its key targets for intervention include companies that are at a relatively early stage of IP commercialisation. The detailed text of the IP financing policy accompanying the Announcement makes particular reference to the challenges of supplying sufficient liquidity for companies to survive during the third to fifth year of operation but contains some case studies indicating that companies that receive IP finance achieve sales growth (of 16.5%) and employ more people (on average 6.5 people).

The Announcement set out four areas of activity. These essentially focused on addressing three main challenges encountered when promoting and facilitating intangibles-backed finance, namely: (1) extending the range of sources for IP-backed finance and reducing interest rates; (2) addressing the lack of confidence in recoverable intangible asset value (through two different initiatives); and (3) introducing measures to bring down the cost, time and complexity of IP valuation. Each of these points is examined below.

(1) Availability of bank loans has been extended: equity is also being targeted

Historically, aside from two state-run banks, KB Kookmin Bank was the only private bank providing an IP financing product. Prior to the Announcement, agreement had been reached with most of Korea's remaining commercial banks to offer similar facilities, including Woori, Shinhan and KEB Hana, at interest rates ranging from 2% to 6%. Participation in the extended scheme was confirmed at an official signing ceremony at an IP Finance Forum in Seoul in April 2019.

Diversification of the range of products leveraging intangible value was also regarded as important, as evidenced by a stated intention to extend funding support availability to trade marks. As well as different types of IP, the Announcement also addressed different funding sources, particularly IP investment funds. A target to raise in excess of KRW 500 billion by 2022 was announced, as well as an intention to introduce measures to promote private and institutional investment in intangibles, including through the use of securities. These latter measures relate principally to training initiatives, and improved linkages/collaborations between different types of technology financiers (e.g. in banks and investment firms) and IP support organisations.

(2) Guarantees are being increased and recovery funds enlarged

The Announcement also set out plans to increase the level of collateral guarantees and cut the cost of their provision in support of lending (thus reducing the effective cost of intangibles-backed loans to the borrower). Other cost reduction measures were also announced, including reducing official fees for the registration of an ownership interest in cases where IP was to be transferred to a financial institution following default.

In parallel with enhanced/lower-cost guarantees, the intention to create a support system to assist with intangible asset value recovery was announced. This involves boosting the IP recovery fund run by KDB (previously operating with a USD 20 million budget) to USD 60 million with contributions from new banking partners, another commitment that was formalised at the International IP Finance Forum in April 2019.

As a separate initiative, Government agencies also announced an intention to establish a specialist recovery institution to liquidate repossessed intangible assets, either via licensing or sale. This is intended to provide an additional value recovery route by offering to purchase assets from defaulting companies from banks, probably for around 30%-50% of the initial agreed value.

(3) Valuation cost, time and format are being addressed

Korea has been active in determining evaluation protocols for over a decade, including (as noted above) the use of online tools to indicate quality (though not actual value). Under the Invention Promotion Act there are strict criteria for organisations permitted to provide intangible asset valuations. In response to company and financier feedback, the Announcement stated an intention to move to a 'demand-customised valuation model', to be more modular in nature.

The supporting IP policy document noted the lack of IP valuation expertise in the finance sector and expressed some criticism of the lack of objectivity in some IP valuation reports currently produced (potentially undermining confidence in the end result). It indicated a need to increase the reliability of valuations by strengthening consideration of the market dimension and expanding opportunities for external scrutiny of the evaluation result.

Lastly, while most valuation organisations have historically been state-linked (with KOTEC and KIPA accounting for the majority of activity), the Announcement also signalled that the private evaluation market needed to be fostered so that competition could be introduced: the accompanying policy indicates a target of increasing the proportion of valuations conducted by private companies from the historical level of around 10% up to 50% by 2022.

From 2019 Korean companies have been able to choose from one of four 'modular' assessment models when applying for intangibles-backed finance, rather than having to undergo a standardised procedure regardless of IP type, business maturity and loan size. This approach is intended to reduce the evaluation timescales to between 2-6 weeks and the costs to a range of KRW 2 million – KRW 15 million (historically these have averaged KRW 5 million – KRW 6.5 million in the case of IP-based loans, or KRW 15 million – KRW 20 million for other purposes).

State-backed intangibles financing schemes: Singapore's approach

IP finance is an element in a wider regional IP hub strategy

The policy context for Singapore's IP financing activity is its objective of becoming a regional hub for intellectual property management and transactional activity in ASEAN. The strategy is intended both to benefit local innovators and make the City State a more attractive location for global IP owners. It may be viewed in the light of Singapore's ranking in the Global Innovation Index, where it has been the highest Asia-Pacific performer after Korea for the last few years (WIPO, 2021[65]) . It is also ranked top in Asia and second in the world in the World Economic Forum Global Competitiveness report (WEFO, 2018[66]).

The Intellectual Property Hub Master Plan (published April 2013) set out the government's intention to create an IP financing scheme for businesses based in Singapore, which was initially implemented for a two-year period from August 2014. The scheme was subsequently extended to March 2018 at the country's IP Week conference in August 2016. The need for measures to support IP-rich companies was also a

feature of the country's updated Hub Master Plan, published in May 2017, and are also a feature of the Singapore IP Strategy 2030, published in April 2021.

Singapore has provided guarantees and subsidies to encourage lenders to engage with IP

In 2014, Singapore policymakers decided to work with local lenders and provide a guarantee facility, initially set at SGD 100 million in total value, rather than lend money directly to businesses. The guarantee facility was overseen by a subsidiary of the Intellectual Property Office of Singapore (IPOS), IP ValueLab, and provided coverage of up to 80% of the value attributed to the IP assets. This was subject initially to a cap of SGD $5m per loan, which was subsequently increased to SGD $10m. No particular restrictions were placed on the uses to which loans issued under the scheme could be put.

The final report used to determine IP value was required to be prepared by a valuer from an approved panel. Literature provided by IPOS to applicants (IPOS, 2016) as the scheme progressed estimated that the costs of preparing the valuation report could be up to SGD 50 000, depending on complexity and valuer choice. The scheme extended to a subsidy for the costs of IP valuation. This was capped at the lower of 50% of the valuation cost, 2% of the IP's deemed value, or SGD 25 000.

The scheme did not include any direct subsidies in relation to interest payments, which were determined by the participating financial institution. All lenders signing up to the scheme were expected to undertake their own due diligence with regard to applicants' credit worthiness.

At the scheme's launch in 2014, it was announced that three banks, DBS, UOB and OCBC, would be participating. DBS and UOB subsequently produced literature promoting the availability of IP finance.

DBS is known to have funded the first two deals which were officially announced in 2016. The first of these utilised the patents of footwear company Masai Group, while the second loan was secured using patented blood sampling technology developed by NSP Tech.

The scheme was not renewed in 2018. However, follow-up work on IP valuation markets was commissioned by IPOS in conjunction with the Singapore Accountancy Commission. These findings prompted experimental work on IP valuation with companies seeking a listing on Singapore's stock exchange, in a programme called the Intangible Disclosure Evaluation and Audit Scheme (IDEAS), officially announced in February 2020.

The IP Financing Scheme was updated to extend its scope

The IP Financing Scheme was modified in several respects, principally when it was renewed for a further two years. In 2016, adjustments were made to the IP rights required for eligibility. At launch, companies had to have granted patents; this rule was subsequently revised to include trademarks and copyright assets, and consideration was given to pending as well as granted patents.

The range of approved valuers was also extended. When first launched, the scheme listed three valuers, which was subsequently increased to seven. As the scheme progressed, applicants were encouraged to have a low-cost, indicative assessment to confirm that their IP value was likely to be sufficient to make further negotiation worthwhile.

This is understood to have been a response to company views on the risks of applying: whilst IPOS provided a subsidy for valuations, it was only available for six months of the offer letter and had to follow drawdown. This left applicants with theoretical advance exposure of up to SGD 50 000 without the certainty that any loan would be forthcoming.

Singapore's lenders also appear to have taken a considerable period of time from first agreeing to be involved in the IP Financing Scheme to the point at which the first advances were made. In 2016, it was

announced that Evia Capital Partners and Resona Merchant Bank (formerly AFC Merchant Bank) were added to the list of participating institutions, but it is not understood that they made any advances.

In line with normal practice, lenders flexed interest rates depending on their overall assessment of risk; given that the asset class was perceived to be riskier (despite the 80% guarantee offered by IPOS), some prospective borrowers found that the cost of servicing the proposed loan would be prohibitive (especially when added to the IP valuation exposure risk), and elected either not to apply or to withdraw from the process.

IP financing has been challenging, but remains part of Singapore's longer-term plan

In August 2021, at its annual IP Week event, IPOS presented a summary of its evaluation of IP finance in Singapore, the first in a series of country reports to be sponsored by the World Intellectual Property Association. This confirmed that a total of SGD 12 million was disbursed under the IP Financing Scheme described above.

The summary report highlighted four main challenges in the provision of IP finance, which resonate with the topics discussed above. These were characterised as (1) the relatively low level of familiarity amongst many lenders with IP and intangibles as collateral (and the lack of internal valuation capabilities); (2) information asymmetries arising from inadequate reporting of IP and intangible asset value contributions; (3) the lack of secondary markets on which IP and intangibles can be liquidated; and (4) a lack of awareness amongst enterprises themselves regarding the importance of IP asset management and commercialisation.

In response to these challenges, the thrust of the new initiatives planned under the Singapore IP Strategy 2030 was set out under three pillars: (1) providing increased opportunities for SMEs to transact business with their IP assets for licensing and sale, chiefly by collaborating with existing marketplace platforms, in order to increase liquidity and thereby improve the attractiveness of the assets to financiers; (2) cooperating with other stakeholders to develop a standardised set of valuation guidelines that can be recognised internationally, to build confidence in asset value; and (3) forming an inter-agency committee to develop a disclosure framework, to assist companies in communicating their intangible asset value. The importance of adopting a cross-governmental approach was specifically highlighted, with IPOS expecting to work in partnership with accounting bodies, financial authorities and enterprise development bodies.

The summary report noted the existence of other routes to finance for IP and intangibles-rich SMEs. It particularly highlighted the government-backed Enterprise Singapore Venture Debt Scheme, which was enhanced in the 2021 Budget to provide loans of up to SGD 8 million via participating financial institutions. One of the first loans referenced, to a maritime solution provider, involved a SGD 1 million raise backed by OCBC.

Reference was also made to the availability of equity finance to Singapore businesses. This highlighted the success of PatSnap, an IP analytics platform based in Singapore, which raised USD 300 million in 2021.

State-backed intangibles financing schemes: Canada's approach

Policy focus is on a dedicated state fund, backed by private sector experience

A division of the Development Bank of Canada, BDC Capital, announced the formation of an IP investments team in 2020 with an initial financing envelope of CAD 160 million. It is branding the new fund as an Intellectual Property-Backed Financing solution. In order to manage the new fund, it brought in the team and the investment process previously used by an independent specialist financier, Quantius.

Quantius was originally established in 2014 to offer term loans to innovative Canadian businesses of 1-3 years in duration. Whilst not solely concerned with using intellectual property asset backing, it incorporated IP analytics and valuation within its investment process in order to examine additional value present within target businesses and establish whether it was available as collateral.

BDC Capital's investment appetite has evolved from Quantius. It is now considering all forms of debt, quasi-equity and equity funding, targeting relatively early stage businesses and providing 'patient capital'. The funding structures can, for example, include convertible loans changing into minority equity stakes.

BDC Capital states that it is targeting a somewhat larger investment size per company (in the range of CAD 3 million - 10 million) with a focus on enhancing the competitiveness of IP-rich companies and providing more capital at an earlier stage of their development. Its website states that there is a requirement for applicants to have internationalisation potential for a commercialised offering that has generated at least CDN $1 million in revenue over the previous 12 month period.

As part of the rationale for launching the fund in July 2020, the BDC Capital website quotes findings (Innovation, Science and Economic Development Canada, 2019[67])that IP-rich SMEs are 1.6 times more likely to experience high growth (defined as 20% or more per annum), 2 times more likely to innovate, 3 times more likely to expand domestically and 4.3 times more likely to expand internationally.

Canada's strategy aims to address investment risk

By bringing in the Quantius team, BDC Capital created an opportunity to benefit from know-how, existing IP networks (in order to facilitate the appraisal and investment processes) and a track record of prior lending. This track record is not large in volume terms, but it is successful: during the period to 2020, Quantius made a total of 11 investments at an average value of CADN 2.5 million, achieving nine exits and bringing two companies to profitability.

This model of recruiting specialist IP financing expertise from the private sector to run a dedicated fund represents one way in which to experiment with this asset class at reduced risk. At this point, the priority for BDC appears to be to gain experience in lending and create persuasive case studies, working to finance innovative businesses that are able to support debt (but which in other respects have a risk profile more closely aligned with equity appetite, owing to their need to build out or fully commercialise technology platforms in order to scale up rapidly).

As well as determining price (in terms of fees and interest rates), a state-controlled fund can also tailor its risk appetite to take impact-related considerations into account (i.e. since it is fulfilling a public purpose, it may be willing to lend more, and/or at an earlier stage, than an independent commercial entity). This is also consistent with approaches designed to inform attitudes towards intangibles as an asset class – in a sense, activity of this nature acts as an applied form of publicly funded research, as well as benefiting the businesses that are funded.

Where the IP evaluation (and if necessary, valuation) process is effectively conducted in-house, the costs of the process become less transparent and less deal-specific (the expertise required is essentially a fixed cost), so are less likely to deter potential borrowers – though if they were to be recovered through fees, it would make this form of credit comparatively expensive.

Also, elevated risk regarding the payment performance of the enterprises being targeted is likely to translate into caps on the amount that can be advanced, at least until such time as more data is gathered. This appears to be the case with BDC Capital, at least in its current phase.

The fund announced its first deal in February 2021, involving provision of CAD 2.6 million to Novarc Technologies, a Vancouver-based robotics company.

Market-led approaches emerging in the United States

The general credit guarantees widely found in Europe are also available to businesses in the United States via long-standing programmes (Brassell and Boschmans, 2019[7]). However, there are no national initiatives which specifically promote or support the use of intangibles in financing. Also, while there is a well-established practice of recording collateral interests against IP rights (usually patents), owing to the benefits conferred by Article 9 of the UCC, this is not necessarily an indication that consideration has been given to their value, or that the presence of intangibles has facilitated the lending decision process; as previously noted, it simply reflects a desire on the part of lenders to obtain additional security by way of a lien on all property which might be of value.

Nevertheless, two trends are now observable in US markets which have wider policy relevance and which have gathered pace since earlier reports. The first of these (1) concerns the introduction of insurance policies to underwrite collateral value: the second (2) concerns the use of specialists in intangible asset recoveries to provide valuations which are genuinely taken into account in credit decisions.

(1) Collateral Protection Insurance

The first trend, concerning the use of insurance, provides a means of addressing uncertainties over recoverable value that does not require a state-backed guarantee. It was first used following the Global Financial Crisis by a small number of US banks seeking ways to resolve shortfalls in collateral provision owing to the collapse in immovable property value and liquidity. A programme operated by M-CAM involved reviews of existing lending portfolios for the presence of patents with recoverable value (via litigation or otherwise); where assets of sufficient quality and marketability were identified, a guaranteed purchase price was issued, backed by an insurer.

This approach first demonstrated that insurance could provide a route to capital relief. The actual level of default incurred on the loans that were re-secured against IP assets in this way is understood to have been extremely low. However, its focus was on strengthening loans that had already been made to companies of varying sizes, rather than facilitating SME access to finance.

The approach of underwriting intangible asset value differs from conventional forms of IP insurance. Current cover is usually aimed at addressing the legal costs businesses will incur in the event they need to prosecute infringers and/or defend themselves against accusations of infringement. These policies are of particular importance in the US owing to the elevated risk of patent litigation; however, underwriters are typically faced with a dilemma regarding information asymmetries and product pricing, because companies generally only take out policies when they become aware of a potential risk. From the insurer's viewpoint, this can be characterised as 'anti-selection'.

By contrast, Collateral Protection Insurance (CPI), as it is becoming known, is directed at providing certainty regarding a minimum recoverable value for a given set of intangible assets in the event of default. The beneficiary of the policy is the lender rather than the borrower. Since the lender has to be in a position to enforce a security interest, a lien will be filed at a state level and at the US Patent & Trademark Office as applicable.

This form of insurance is directed at rectifying a loss that proves to be unrecoverable after a lender has made efforts to address it. Policy wording typically provides a period of time within which a lender would normally seek to remedy a default with a borrower. At the end of this period, the insurer can take possession of the assets in order to dispose of them (though it may accept an obligation to accept any offer, e.g. from a company's investors, which repays both insurer and lender).

At the time of writing, at least three US brokers are offering CPI: IPISC, PIUS and Aon. All are known to have written policies for small numbers of companies to date. The largest and most well-publicised fundraising utilising CPI relates to a USD 100 million deal written by Aon IP Solutions to a pre-IPO

agricultural technology company, Indigo Ag, in October 2020. It provided a means of underwriting non-dilutive growth funding to a company with around 90 granted patents, 250 pending applications and over 50 trademarks. At the time of announcing the Indigo deal, Aon indicated it had a further 23 transactions in the pipeline.

(2) Applying asset-based lending practices to intangibles

The second trend, involving targeted use of intangible asset valuations, is essentially an extension of asset-backed lending approaches, particularly factoring/invoice discounting, which appears to have developed most traction on the East Coast. Lenders such as Wells Fargo and Citizens Bank are among the larger US banks known to have used the value of intangible asset 'bundles' to enhance competitiveness of their loan terms and to 'stretch' the amount of the facility they are prepared to provide, often by involving a junior lender. It represents a practical application of the principle that the last asset a company will willingly part with will be its IP (in which case, the level of risk can be said to correlate with the company default rate).

Valuer interviews indicate that experimentation with IP-based lending began in 2006-7 at the top of the economic cycle, in an effort to improve yields. The global financial crisis stopped these experiments, but they re-started in around 2011 and have gradually increased since in quantity and value. The number of valuations conducted for these purposes is still currently modest (estimated by market participants to be less than 200 per annum), but it is believed that these could be facilitating up to USD 2 billion in lending.

The types of valuations conducted for these purposes are different from 'traditional' IP valuation approaches in two ways (traditional approaches, such as those practised by accounting firms, are generally directed towards determining fair market value). The first is that there is a substantial emphasis on 'bundling' different types of intangibles (while patents will be taken into consideration, other assets such as customer databases, digital assets and trademarks may also be included in the valuation). The second is that the approach to value determination is driven from a 'bottom-up' perspective (from recoveries) rather than a 'top-down' view (from incomes): essentially the starting assumption is that intangibles are likely to have minimal recoverable value unless factors are identified which indicate they could be sold.

The need for security over the assets is generally managed in one of two ways. Assuming that there is a senior secured lender who has a lien on all a business's assets, and a junior lender willing to advance the additional sum that provides the 'stretch' amount, either an inter-creditor agreement will be drawn up, or the junior lender will be permitted to take a senior interest in defined IP and related assets.

The providers of the valuations are primarily organisations that specialise in recoveries, such as Hilco (through its Streambank division) and Gordon Brothers. The amount of company-specific research is substantial, as a result of which the valuations may cost upwards of USD 30 000. These will determine a predicted liquidation value for the identified intangible assets, up to 50% of which (after deduction of costs) may be used as security for lending on an amortising loan. The amortisation is important as this provides an additional safeguard for the lender (the realisable value of assets in liquidation tends to reduce at a slower rate over time than the amortisation rate applied to the loan).

Successes, lessons and challenges

The two trends in United States finance and insurance practice, while still at a relatively low level of utilisation, appear to have considerable potential. Both need to be seen in the light of the particular characteristics of the US market, though these have both positive and negative implications for IP-backed financing.

The positive characteristics of the US market include the popularity of patenting. Rates per 10 000 workers published periodically by WIPO show a frequency substantially higher than is the case in Europe, though not as high as in Japan or Korea. The advantage of patents in intangibles financing is that they provide a richer source of data than other IP rights – in terms of their prosecution history, their content, territorial

scope and classification tags, among other attributes. A range of sophisticated analytical tools are available to interrogate patents.

The emphasis placed on 'bundles' of intangibles in determining liquidation value appears instructive. Given the increased use of data made by knowledge-based businesses, there is likely to be recoverable value in assets such as software code and algorithms, artificial intelligence programs, database designs and other copyright-protected assets that are unlikely to be patented. Interviews with recovery agents indicate that historical trading records and databases are often some of the most valuable and saleable assets that companies possess (provided that data protection regulations permit re-use). Offering other companies operating in similar markets the opportunity to obtain additional share in the event of a business failure is a viable business model, provided the assets are appropriately scrutinised beforehand.

At present, CPI policies are low in volume. This makes them expensive, and may place them out of reach of many SMEs. After taking all costs of assessment, CPI and 'conventional' IP insurance cover into account, this form of cover may represent a cost of 10% or more of the loan, partly because the underwriting process is currently entirely bespoke. However, with interest rates currently at an all-time low, the total cost of capital may still be attractive to high growth firms, especially if the available alternative is equity investment. Also, as volumes grow, improved data on risk and recovery should enable assessment to be refined and costs to fall.

There are three main factors that will need to be addressed in order for widespread adoption to occur. Firstly, the costs of the cover (and of the appraisal, valuation and underwriting activity needed to issue it) need to be carefully managed in order to ensure that the finance on offer can still be competitively priced. Secondly, insurance requires a spread of risk in order to operate successfully, which means that it needs to operate at scale. Thirdly, good data to inform underwriting can only be achieved with scale.

Summary of lessons learned

The country for which it is easiest to reach clear conclusions and lessons is Korea, owing to its recent publication of a detailed analysis of progress made to date and a clear set of future targets. There is evidence of a clear long-term commitment to embed intangible assets more firmly in the lending landscape using a range of measures which tackle cost and risk at all points in the process (and also include measures to encourage access to other forms of finance, principally equity). There is also clarity on the type of valuation methodology to be used. Whilst guarantees and subsidies remain essential elements for the time being, obtaining buy-in from a wider range of lenders, addressing recovery concerns and expanding the provision of assessment services are logical steps to increase capacity and generate better data to inform future decision-making.

Singapore has also recently published an evaluation of its IP Financing Scheme and set out ways in which it intends to incorporate its findings into its long-term IP strategy. The two fundamental issues noted in previous research (Brassell and Boschmans, 2019[7]), namely confidence in the realisable value of the assets and high transaction costs, appear to have impacted the discontinued scheme's traction. The main issues identified in discussions with lenders and potential borrowers have been related to cost and uncertainty; while the cost point (related to both the evaluation process and the cost of borrowing) is not specifically addressed, Singapore has set out a range of measures to tackle uncertainty, including supporting the development of transparent markets, building more confidence in the valuation process, and improving asset disclosure.

The Chinese experience shows that a degree of scale can be achieved in IP financing. Providing local and regional governments with the flexibility to devise their own policy responses has encouraged experimentation and has clearly produced some successes. However, while the level of engagement with these state-supported initiatives has been quite high, fundamental bank attitudes have not yet changed;

this may be because their lack of confidence in realisable asset value, and the elevated transactional costs involved, have yet to be decisively addressed. As a result, where targets and incentives are removed, IP-related lending activity either stops, or its level is much reduced. This is likely to be a future point of policy focus.

The Canada approach differs from the three examples examined above in two important ways. Firstly, it is a dedicated fund rather than a lender engagement programme, in which respect it has some parallels with historical activity in Japan, Korea and Malaysia. Secondly, although not a public-private initiative, BDC Capital has brought in private sector expertise. Close alignment between expertise in specialist technology finance with credit decision for dedicated state-backed funds enables some of the potential problems concerning lender trust in the evaluation process to be addressed.

On the face of it, the “popularity” of patent litigation environment in the United States would appear to be a deterrent to IP financing (because a successful challenge to either the validity or enforceability of a patent could undermine the income streams that are required to service an IP-backed loan). Undoubtedly companies offering all forms of insurance need to be mindful of litigation risk and help companies to be sufficiently well resourced to be able to defend their revenue-generative assets. However, the fact that litigation is a known risk also means that there is a more active market for buying and selling IP rights, usually motivated by improving a company’s defensive (or offensive) portfolio rather than an opportunity to commercialise. This indicates, among other things, that an effective enforcement regime for IP rights is conducive to an active market (especially since rights that cannot practically be enforced are of questionable value).

Insuring the recoverable value of intangible assets appears to have considerable promise, especially since unlike physical tangibles, the risks associated with one company’s IP are unlikely to be closely correlated with any other (due to the unique nature of the assets involved). The fact that insurers are subject to a different capital adequacy regime opens up clear potential for CPI cover to drive capital relief, which may help to offset the higher costs of provision.

5. Conclusions and policy implications

As set out in this paper, considerable progress has been made on secured financing since the global financial crisis. Model legal frameworks and operational guidance have been produced and implemented across a substantial number of countries. However, more can be done to improve access to finance for SMEs, especially those that own few immovable assets that can be used as collateral. As identified above, companies with 'conventional' forms of tangible collateral are not only reducing in number in both developed and developing markets, but have a proportionately smaller impact on economic development because they are less innovative and grow more slowly.

The urgent need for effective steps that assist economies to recover quickly from the COVID-19 pandemic should give fresh impetus to policy measures targeted at improving SME access to finance. Most companies' cash deposits will be depleted as a result of the pandemic; they may also have less receivables to leverage, and may have faced difficulties in obtaining inventory; conversely, they may be holding large quantities of stock which cannot be dealt with in the usual way. Such firms face considerable uncertainties regarding the resumption of 'normal' trading, and these uncertainties both increase the need for external forms of finance and the importance of appropriately targeted intervention measures.

Many countries have implemented programmes that have provided a temporary boost to credit access (e.g. by modifying existing loan guarantee schemes). These risk exposures will require careful management over the longer term. It may be desirable to move some of them into asset-backed structures, in cases where collateral of value can be identified within the business.

Where financing programmes are largely driven by the private sector, such as in the United States, there are promising indications that insuring intangible assets may provide access to capital relief (driving down the cost of lending, and therefore borrowing) as well as offering lenders the reassurance of recoverable value that lenders require. However, such insurance needs to be capable of operating at scale if it is meaningfully to facilitate SME access to finance. While scale builds, there could be a case for subsidising premium costs, in the interests of fostering a reduced requirement for state support in the longer term.

At a macro-economic level, there are two areas that require particular attention. The first is to ensure that national measures do not further embed lender reliance on immovable collateral (in many ways a less liquid asset than movables) in the interests of financial stability, already identified as an impediment to SME lending. To do so will suppress economic recovery by further restricting access to capital to the firms that have the greatest capacity for growth; this is an existing, if unintended, consequence of the finance industry's response to the global financial crisis, a point further developed below.

Though not the focus of this paper, it is important to note that there is also a risk of a further unintended consequence from changes to insolvency law. Whilst provision of more time to enable businesses to restructure is a sensible measure, not least to reduce unemployment, the second area for attention is to ensure steps do not undermine the effectiveness of secured lending instruments to the point that this lessens the options available to SMEs, including companies in distress.

Conclusions on collateral registries

Research evidence demonstrates that the introduction of collateral registries has a quantifiable and positive effect on company access to bank lending, and further suggests that these steps are particularly beneficial for SMEs. As well as improved access, interest rates reduce and loan terms extend when information on existing indebtedness is clear and accessible and lenders can confirm that collateral is unencumbered. These findings will encourage countries that are yet to implement change to collateral registration, or are working to make these registries electronically accessible.

The effectiveness of any registry will be dependent on the legal framework that supports it. The UNCITRAL Model Law embodies important principles that facilitate the use of moveable assets in finance. However, as the case studies in this report demonstrate, new laws intended to establish (*inter alia*) the priority of different and conflicting interests and issues of possession and control over assets do not operate in a vacuum; they may be at odds with pre-existing commercial practices, and/or with in-country legal frameworks and precedents. Security laws and registries may also need to be modified as practices change and new asset classes emerge, so policymakers should not expect the introduction of a collateral registry to be 'fit and forget' in nature.

Depending on the degree to which collateral registries are already electronic, there may be benefits in considering the application of digital ledger technologies. However, the World Bank Group's analysis indicates that these benefits are not currently compelling where registries are already reasonably well developed. Whilst these ledgers can list actual assets in some cases (such as Bitcoin holdings and transactions), in the collateral context their primary use would be to note the existence of security interests that are perfected through other methods. Depending on the territory, their legal status may also be uncertain, though this would not necessarily prevent them being deployed as a technology alongside a registry.

There are two main areas of complexity which policymakers will need to consider carefully. The first concerns the use and status of existing specialist registries. These perform a valuable function in facilitating transactions (which help to make regularly traded asset classes more liquid and therefore easier to value and finance), and provide a clear point of reference to help their status to be determined. However, they give rise to the potential for priority conflicts, especially if best practice in reducing the risk of unauthorised resale requires registrations to be made in more than one place.

The second concerns intangibles such as intellectual property rights. There are special characteristics and laws that apply to these assets, which cause some tensions with standard secured financing concepts of possession, control and use. Also, the propensity of companies continually to produce new assets needs to be properly and reasonably accommodated in financing agreements and security interest registrations, without giving lenders a monopolistic position in respect of the borrower.

Importantly, if these assets are to be leveraged as collateral in the ways envisaged in the following section, the statutory registers that hold information on their identity, status and ownership also need relevant financial information to be readily accessible and easily updated. At the moment, only the UCC in the United States appears to provide an effective incentive for lenders to utilise these notice mechanisms: more could be done by other national intellectual property offices to encourage timely and accurate security interest registrations.

Conclusions on intangibles financing

There is a growing justification for policy action

There is strong evidence that IP and intangible-intensive companies contribute a disproportionately large amount to economic development (because they grow faster, last longer, and employ more people). Moreover, there is also clear evidence that contribution made by intangible assets to company value more generally is large and growing. However, the more important intangibles become to businesses, the more problematic it becomes if their value cannot be leveraged to facilitate growth finance.

As noted above, previous papers have drawn a connection between the shift of OECD economies towards intangibles and the reallocation of banking portfolios from commercial loans to real estate lending (Dell'Ariccia et al., 2017[68]). This causes capital to flow to lower productivity sectors, with the side effect of increased macro-stability risks. This tendency has been strengthened by tighter prudential regulation in the wake of the global financial crisis, which links the amount of reserves banks need to maintain in the interests of financial stability to the type of loan held on their balance sheet.

At present, intangibles-backed loans are considered inherently riskier and attract no capital relief, further increasing the attractiveness of tangible forms of collateral such as physical property which are not linked to innovation. There is also a suggestion that the increasing firm-level investment in intangibles, and the relatively small proportion of it that is financed by banks, represents a threat to monetary policy transmission channels because it makes investment less responsive to changes in interest rates (Crouzet and Eberly, 2019[69]) .

Most SMEs look to banks for finance, and it is clear that banking sector has the potential to finance intangible assets that are codified and transferable. However, support is needed to make this change and encourage lending to intangibles-intensive firms, because banking regulation, custom and practice are less well suited to this asset class.

A number of measures have been identified in previous research, including reducing information asymmetries (e.g. by improving accounting standards), making it possible to collateralise intangibles (e.g. by IP-backed loans) and improving routes to value realisation in liquidation by developing secondary markets. Since intangible capital appears to make a critical contribution to economic resilience and recovery, the COVID-19 pandemic makes the need for effective action to improve access to finance for sectors that are intangibles-intensive all the more pressing (Demmou and Franco, 2021[36]).

Policy interventions should pass four tests

Given these imperatives and identified risks, the research set out in this paper indicates that an effective national solution needs to exhibit four characteristics:

- (1) It must address the lack of lender confidence in recoverable intangible value;
- (2) It should be structured and delivered in such a way that it can compensate for the absence of capital relief against intangibles under current banking regulations;
- (3) It must be deliverable at scale to the companies and sectors which can have the greatest economic impact, i.e. to SMEs, rather than being restricted to larger firms with substantial established intangible asset portfolios (who will typically have a variety of funding options at their disposal);
- (4) Achievement of traction and scale necessitates that additional costs must be low, at least over the medium to long term

General guarantees are beneficial, but should preferably be supplemented with more targeted measures

In considering how such a solution might be delivered, it is important firstly to acknowledge that some measures already in place to facilitate loans to businesses lacking tangible asset collateral are of benefit to firms that are intangible-intensive. It is also evident from available analysis of the largest pan-European schemes that these guarantee programmes do result in increased intangible investment. Some, though not all, can facilitate lenders obtaining capital relief; a few of them (such as products offered by BPI France) have elements targeted to the needs of innovative businesses. The question to be answered is therefore what additionality a scheme that is more specific to intangibles can really provide.

In the context of intangibles, the critical issue is that state-backed general guarantee programmes address a symptom (continued lender insistence on tangible forms of collateral which fewer and fewer businesses own) rather than the cause (enabling the asset class businesses actually own to be used as collateral). As illustrated in the research literature, failure to address this apparent "tyranny of tangibles" has a number of undesirable side effects. These issues are more pressing as governments seek to recover from the shock of COVID-19 by encouraging innovation or growth; inaction on intangibles risks further institutionalising lender preferences for immovables.

Other issues with general guarantee programmes include the limits in the risk coverage they provide (and therefore the access to capital and to capital relief that they can actually facilitate). Also, depending on their design, they may not prevent lenders still requiring additional forms of security, such as personal guarantees or charges/pledges over other assets, which SMEs may be unable or unwilling to provide.

(1) Addressing the lender confidence issue

Collateral has a particular meaning for lenders; it specifically embodies an expectation that value will be realisable in default. Ideally, for a lender, this means being able to determine what that value may be in advance, and having access to a transparent market on which that value can be realised.

Intangibles are capable of exhibiting the basic core properties required, namely separability and transferability. However, there are certain additional properties exhibited by intangibles that cannot be changed without impairing the asset's value. For example, one critical strength relates to intangible heterogeneity (they are unique as well as diverse) which is a quality which makes them fit for very particular and specific purposes. This quality explains why these assets are not regularly traded by firms that own them (other than by way of licence): they are simply too important to be bought and sold in the ordinary course of business.

This property of heterogeneity makes it difficult to envisage how intangibles, even formally codified ones such as IP rights, can be effectively advertised for sale on marketplaces that are best equipped to deal with assets which are (to a lesser or greater extent) commodities. The problem is exacerbated where it is important to maintain some of these as secrets (for example, because they are pre-publication patent applications or confidential information). This suggests that attempting to establish successful state marketplaces for intangibles may meet with limited success (although sales in China through platforms such as Alibaba are growing; also, Singapore's approach, of seeking to build confidence in IP value by facilitating other types of trade such as licensing, could contribute to better understanding).

However, it would be incorrect to interpret the absence of open marketplaces as evidence that intangibles assets do not have realisable value. As well as an active brokerage market (better suited to maintenance of commercial confidentiality), merger and acquisition activity, especially in sectors such as technology, media and telecoms, is often driven by the need to control scarce but highly scalable intangibles. Recovery of value is therefore possible, even for assets of distressed businesses; it simply involves different procedures (these are at their most advanced internationally in the United States).

Therefore, the lender confidence issue appears best addressed in three ways: firstly, by increasing the visibility of intangible asset contribution to enterprise value (especially, building on previous research to confirm that strong intangible portfolios are firmly associated with business success); secondly, by encouraging the development of specialist disposal routes (as Korea is doing); and thirdly, and most crucially, by providing a system that provides a 'safety net' if a lender is unable to recover value through the normal process of rescheduling, refinancing or restructuring a business (which is the aim of guarantee schemes, and could be facilitated by greater use of insurance in future).

Whilst guarantees do not prove that the intangibles used as security can function as collateral, they insulate lenders from most of the risk of non-recovery (in some cases, nearly all of the risk). Depending on how they are constructed and treated, they may also be capable of providing a degree of capital relief, also addressing point (2) below.

As yet, no state-backed approach appears to have decisively changed lender attitudes to intangibles. The strategy pursued in Korea, which now involves a wider network of banks in both issuing loans and subsidising the costs of recovery, is arguably the most ambitious, but had insufficient time to evolve prior to the COVID-19 pandemic to be able to objectively assess progress at this point in time.

The Canada sceme is in its infancy but represents an important experiment. While not directly seeking to change banking behaviour, it may be successful in altering attitudes to intangibles by showing that it is possible to lend profitably and effectively to IP-rich businesses provided the role and importance of these assets is correctly assessed. As a state-backed fund, it can take a view on the level of cost passed on to target borrowers.

(2) Addressing liquidity relief

It is clear that revisions to Basel III regulations would be helpful for the cause of intangibles financing. However, as is also the case with accounting standards, change will be very difficult to achieve, requiring extensive international co-operation. Accordingly, it should only be attempted when there is a good chance of success, which is dependent on the presentation of clear evidence showing change is justified and necessary. It follows that concrete steps need to be taken to demonstrate how and when intangibles can be used as collateral in an effective manner using other methods, without waiting for regulatory change to happen.

One promising route is to facilitate a process by which banks are able, at least as an interim measure, to transfer part of their balance sheet risk to insurers, organisations that can take a broader economic view of risk exposures under existing Solvency II regulation. Schemes whereby this may be done with some additional element of public-private risk sharing have been proposed by the British Business Bank (2018) and solutions driven entirely by the private sector are already available to larger companies in the United States from at least three brokers (though policies require appropriate structuring in order to offer the desired capital relief advantages). This option, if accompanied by appropriate asset underwriting steps, has the potential to meet all four tests proposed above.

Policymakers can initiate early discussions with prudential regulation bodies responsible for banking and insurance to confirm that appropriately pre-qualified intangible assets that are backed by government guarantees, private sector insurance policies or a combination of the two can qualify for capital relief. This will reduce the cost of lending, and represent an important first step in addressing the unintended consequence of heightened reliance on immovable tangible assets which measures to address banking sector failures have inadvertently institutionalised.

(3) and (4) Delivery at scale, and at low cost

The state-backed approaches applied to intangibles that are set out in this report mostly rely on the use of two tools in order to encourage both demand and supply of intangibles finance. These are targeted

guarantees (in some cases, dedicated funds) and targeted subsidies. Providing sufficient guarantee provision (or insurance cover) to be able to build scale is essential, not least because lenders need to know that support will still be available for a number of years after an intangibles-backed loan has been made.

Most IP financing approaches are targeted at SMEs; two can be said to have achieved a degree of scale (Korea and China), whereas others have not. The subsidies have been used to increase loan affordability either by addressing interest rate premiums that would otherwise be charged to offset higher risk, and/or to offset the high transaction costs that would otherwise be incurred (typically for valuation and other due diligence enquiries).

However, a better approach would be to drive down these costs in the first instance. Advances in data science offer a genuine prospect of increasing standardisation of appraisal processes, thereby reducing valuation cost and complexity over time, especially if informed by better intelligence on asset recoveries (and on cases where businesses' intangibles are sufficiently strong that any defaults are readily resolvable). These advances are unlikely to be achieved by government action in isolation, and the application of wider private sector expertise in risk management and recovery, as well as IP and intangibles appraisal, will be required to achieve this objective.

In order to truly change lender attitudes to the asset class, it is necessary for defaults to happen so that recoverability can be proven. It follows that effective pre-qualification steps must be put in place to ensure that only intangibles which can demonstrate suitable separability/transferability characteristics are used as collateral.

Where this is not done, any guarantee or insurance policy (or combination of the two) will have to be written on a total loss basis. This will inevitably inflate costs and distort outcomes. In this regard, determination of value (whilst important and necessary) is not the key issue; it is the question of whether some of the value in selected intangibles can endure an insolvency event, and thereafter behave in a manner similar to other forms of collateral which are better understood by lenders (i.e. by being separable and transferable).

This is not to say that intangibles cannot perform a valuable signalling function which assists in overcoming information asymmetries and reducing cost in other forms of lending which do not necessarily rely on their use as collateral. This signal may be especially useful following the COVID-19 pandemic, given the link between intangibles and firm resilience set out in previous chapters.

Innovation, not regulation: the role of public-private partnerships

It may be tempting for governments to seek to introduce additional regulations in order to build confidence in intangibles-backed finance, for example in the quality of valuation service provision. However, when dealing with intangibles, great care must be exercised not to stifle innovation. An example comes from the FinTech sector, where regulatory burdens have had to be revisited in order to facilitate the adoption and roll-out of digital products and services. These innovations reduce cost and increase convenience (while still ensuring essential protections are in place).

Korea introduced strict regulations regarding IP valuation, but has reflected in its most recent review that more needs to be done to encourage engagement from the private sector. Governments can profitably consider how best to 'pump-prime' initiatives that encourage a public-private partnership approach, to build confidence and accumulate and pool the data resources associated with intangibles-backed lending and trading.

There are limits to the part that subsidies can play in effecting lasting attitudinal change because they are generally limited by time and cost (and lenders may reasonably fear that they may fall away if policy appetites change); this learning is apparent from Chinese experience, where primary research indicates that activity falls away when subsidies disappear. However, in the absence of sufficiently deep data

reserves, there is likely to be a part for subsidies to play in short-term cost control so that the benefits of using intangible as collateral can be properly tested with the appropriate target group of businesses.

Clarity of objective

This raises one final important point. Policymakers need to be clear on the limits of using intangible assets such as intellectual property as collateral when seeking to encourage investment that will boost growth and employment through encouragement of start-ups. Unless they are founded with the benefit of exclusive rights in well-developed assets such as patents (potentially from the knowledge base), few such start-ups have assets that are usable as collateral.

The form of financing under discussion, that can truly utilise IP as collateral, is much better suited to companies that have managed to assemble some intangibles that can be linked to creation of value through related trading activity and early market traction (as a minimum). It is therefore eminently suitable for knowledge-based “scale-ups”.

Where states wish to utilise IP and intangibles that are immature or yet to gain much market traction (as in the case of Korea), further and more interventionist support measures are likely to be required in order to protect lenders against the elevated risks of non-recovery.

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