



Exploring the value of financial services across digital platforms in the construction sector

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In partnership with



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1. Introduction

This note forms part of a series that explores the relationship between digital platforms, their participants and the potential value of financial services to these participants.

Digital platforms offer opportunities for economic growth and inclusion by optimising the matching of demand and supply for labour and opening up of global marketplaces to local workers and enterprises. Digital platforms also have a distinct value proposition in addressing certain eligibility and affordability barriers to participation in various sectors, which are becoming ever more digitised. However, individuals operating in the platform economy are generally employed on a contract basis, which may expose workers to exploitation and limit the extent of access to social protection benefits (e.g. worker's compensation) that are typical in traditional employee-employer relationships. Given the existing informality of work in most developing countries, this note series seeks to explore the realities of platform participants to consider how their livelihoods and needs are affected.

Formal financial services present a market-based solution to resolving risks faced by platform participants. For example, risks related to asset damage





and/or bodily injury are a class of insurable risks which could be managed through fit-for-purpose insurance products if designed appropriately to meet the distinct needs of workers and suppliers operating within the platform ecosystem. Market-based solutions for reducing the frictions faced in platform participation need to consider the distinct nature of economic activities per sector and the journey that platform participants face. A better understanding of how financial services can be applied to meet platform participant needs is needed to inform platform and financial service design.

In this note, we focus on the construction sector and present findings from a global review of digital platforms. The research study further seeks to understand how the platforms match different groups of participants (i.e. contractors, workers, homeowners and suppliers), which financial products are distributed on the platforms, the incentives for offering these products, and how the products can add value to the lives of the participants.



In this note, we focus on the construction sector and present findings from a global review of digital platforms.



Box 1. Definition of a construction platform

In this study, we define a construction platform as a multi-sided digital platform (MSP) that facilitates direct interactions between different types of interdependent participant groups across the construction value chain (i.e. preparation and design phase, through the execution and user phases to the demolition phase – see Box 4 in the appendix). Included in this study are freelance platforms that aren't specific to the construction industry but that allow individuals to conduct construction-related activities.

Features:

- **Multi-sidedness:** Connecting two or more distinct groups of participants in an interaction
- An **exchange** must occur between the participants (i.e. payment for services rendered) that is observable by the platform. This review only considered platforms where transactions between the participant groups are settled on the platform.
- The participant groups must be **directly interacting**.
- Must be **virtual** (online/digital) and accessible through the web or mobile phone
- The users must be **distinct and interdependent**, i.e. the participation of one group of users affects the way other groups value the service/good being provided, and one group cannot capture the value from the exchange in isolation.

Sources: Smit, Johnson, Hunter, Dunn and Janse van Vuuren, 2019; Martens, 2016; Evans & Gawer, 2016; European Commission, 2016.

2. Overview of the construction sector

The construction sector contributes significantly to economic growth and resilient cities. In 2019 the industry accounted for 13% of global GDP¹ and industry spending amounted to USD11.4 trillion (Statista, 2019a). Construction is also a labour-intensive industry – roughly 7.2% of the global workforce is employed in construction, representing an estimated 239 million people (excluding informal activities) (ILO, 2018). On average, the sector employs between 5-10% of the formal sector workforce in most countries, making it one of the largest employers worldwide (Buckley et al., 2016).

Table 1: Construction industry performance: Key indicators across regions

	Unites States	Europe	Sub-Saharan Africa	Asia-Pacific	Latin America and Caribbean
Size of construction industry (% of GDP)	4.1%	3.5%	4.5%	6.8% (SE Asia)	6.6%
Construction industry value (USD)	1.29 trillion	1.78 trillion	471 billion	4.95 trillion	287.1 billion
Formally employed individuals	7.5 million	4.8 million	n/a	n/a	9.3 million
Share of total employment (%)	7.3%	6.8%	4.6%	7.7%	7.5%

Various sources

The construction sector also provides employment opportunities to unskilled and semi-skilled workers. Informal employment as a share of total employment in the industrial sector – of which construction is a part – is 57% (global estimate) (ILO, 2018; Cremers et al., 2017). This share is as high as 70% in emerging countries and is predominantly comprised of self-employed individuals and, micro, small and medium enterprises (MSMEs) (ILO, 2019). MSMEs are often preferred for the flexibility that comes with outsourcing goods and services, and the specialised services that MSMEs are often able to provide (ASK-EHS, 2019; Cremers, 2017)².

The industry's outlook has generally been positive, however various challenges including long term impacts of the recent Covid-19 pandemic³ must be overcome to meet global demand. According to Turner and Townsend (2018), more than 90% of the 64 markets they surveyed globally are either lukewarm (i.e. less competition, higher prices and increased demand) or are expected to “heat up” (i.e. more projects, less competition in bidding and thus higher tender prices). Despite this positive outlook, population growth and urbanisation are placing increased pressure on the industry to provide enough infrastructure. Globally, an additional 2.5 billion people are expected to move into cities by 2050 (United Nations, 2018); 1 billion of these are expected to be living in Africa (Saghir & Santoro, 2018; JICA, 2013). To meet this expected demand, USD57 trillion in infrastructure investment is required globally for the next 10 years (Dobbs et al., 2013). In Africa, USD130–170 billion worth of infrastructure is required per year, or USD1.3 – 1.7 trillion per decade (AFDB, 2018). This has been compounded by

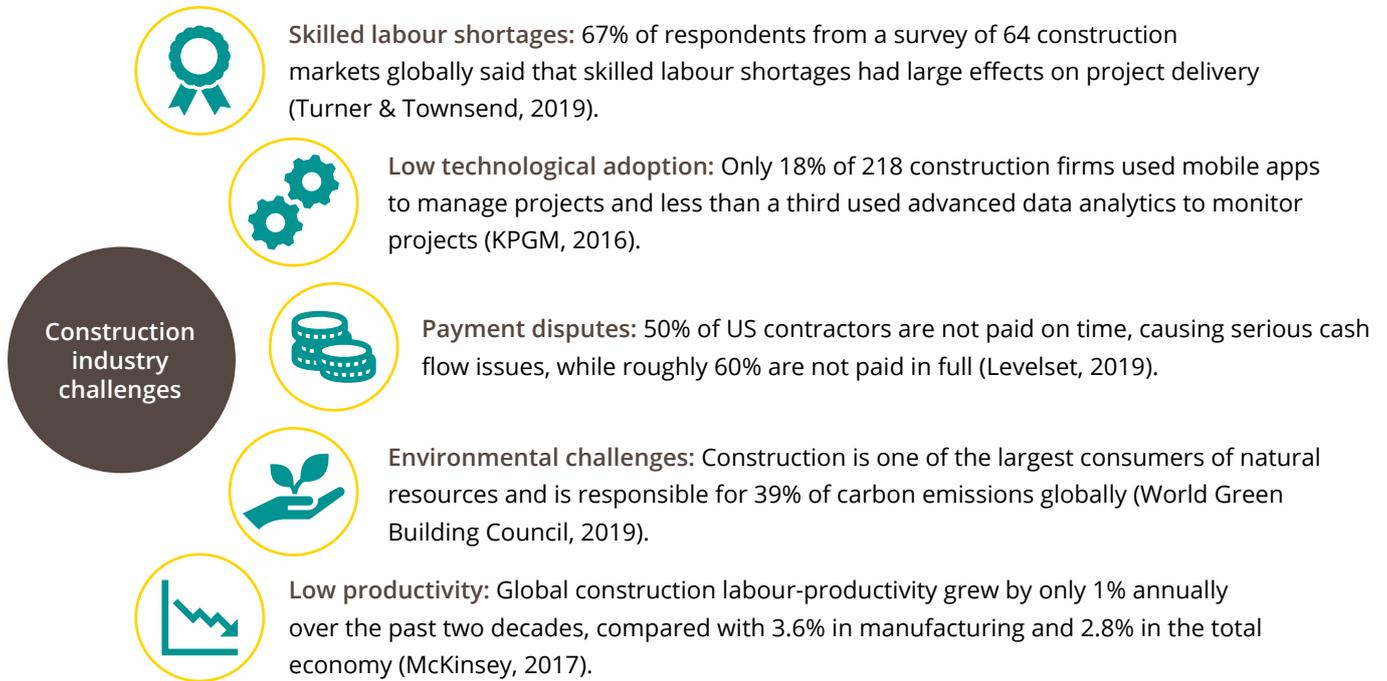
1 To put this into perspective, in 2017 agriculture contributed 3.42%, industry contributed approximately 25.5% and services contributed about 65.04% to the global gross domestic product (Statista, 2019).

2 See also Tunji-Olayeni et al. (2016), and pbctoday (2019).

3 Van der Merwe et al., (2020).

the recent Covid-19 pandemic which has greatly disrupted the sector leading to financial pressures, labour shortages and supply chain issues. Further, there are several key challenges that inhibit the industry's performance (see Figure 1).

Figure 1. Construction industry challenges



Various sources

Digitisation may improve how the construction sector operates to address critical challenges. Partly supported by digital platforms, digitisation and associated data infrastructure supports contractors and companies to make better informed decisions around sourcing and scheduling labour and materials, managing budgets, enhancing safety and streamlining supply-chain operations (Deloitte, 2019). For example, construction platforms specialising in asset-sharing activities enable construction companies to rent out their equipment. This allows them to share fixed costs and maximise the utilisation of capital assets, which are found to be heavily underutilised in more traditional business settings. Platforms also create new channels of access for informal workers to participate in the formal economy, thereby resolving one of the major challenges facing the industry: a shortage of skilled labour (Turner and Townsend, 2018).

The complexity of the construction value chain raises a range of risks that need to be addressed. In terms of risk categories⁴, platform participants can face hazard, operational, strategic and financial risks on the job and individual suppliers and workers could be held liable in most cases, rather than the platform itself. The digitisation of construction-based activities can add to this complexity by introducing additional layers of risk, especially for inexperienced users wanting to do business within a digital platform environment. Understanding risks faced by construction workers and the resultant liabilities are a useful starting point for comparing the coverage and benefits associated with financial services which are targeted at participants in the construction platform sector to identify gaps and opportunities for the financial sector. In Section 4 of this note, we explore the extent of risk coverage through insurance offerings which are distributed by construction platforms.

4 To better understand the risks and challenges faced by users of platforms during construction processes, we developed a risk typology by using a framework established by the Casualty Actuarial Society (2003), which classified risks faced by businesses of all sizes (see Figure 9 in the appendix). This framework was adapted to include risks faced by the individual users on construction platforms (i.e. homeowners or micro-workers), as well as individual suppliers or contractors (who often operate solo in informal markets). The risk typology classifies the risks faced by both individuals and businesses into four distinct categories: hazard, operational, strategic and financial. Individuals typically face hazard risks (i.e. accidents to self) as they are physically present during the construction process, while businesses usually face operational, strategic and financial risks.

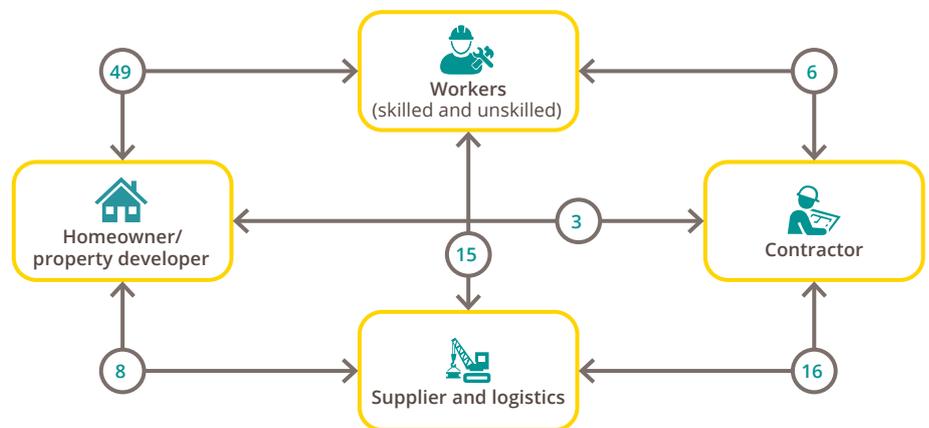
3. Landscape of construction platforms

67 unique digital platforms were identified in the construction space – 40 in North America, 27 in Europe (including the United Kingdom), 17 in Africa, 15 in Asia, 10 in Australia and New Zealand and 7 in Latin America (see Figure 10 in the appendix). Across the platforms studied, 73% were found to operate in one country. This is unsurprising given the place-based⁵ nature of construction work. However, differences in building codes and standards across countries presents a challenge for digital platforms in scaling across borders within regions where regulatory harmonisation has not been achieved.

Four main participant groups are served by platforms: workers, homeowners/property developers, suppliers and logistics firms, and contractors/construction companies as set out in Figure 2. A key feature of digital platforms is that they allow different participants to connect and transact with one another along various dimensions of the construction value chain. We found that the most common type of matching of sector participants occurs between homeowners/property developers and workers, followed by platforms connecting contractors and suppliers/logistics firms. Box 6 in the appendix contains descriptions of the matching activities between these participant groups and the following figure⁶ shows the frequency of the different types of matching.

Figure 2. Types of platform matching activities (multi-tagging)

○ Frequency of matching between participant groups



Freelance platforms are most prevalent. Construction related activities are facilitated through both general freelance platforms that offer a variety of services, as well as specialised construction platforms. In our global scan, we identified 40 freelance platforms and 27 construction-specific platforms, which focus solely on construction-related activities. In addition to construction-based activities, freelance platforms also provide other services in the on-demand economy (e.g. delivery, home cleaning, furniture assembly).

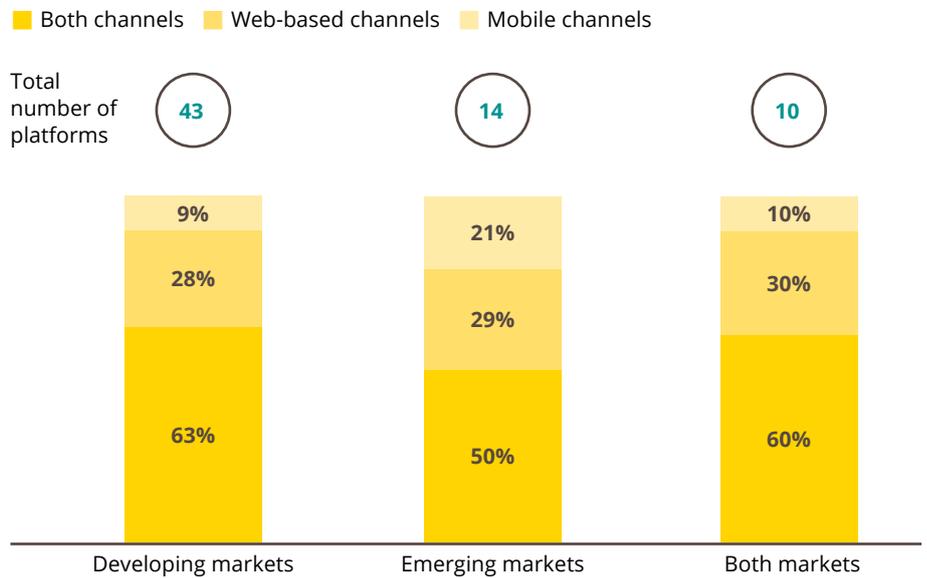
5 This speaks to the physical proximity between providers and consumers, and the physical nature of work.

6 Multi-tagged refers to the fact that the matching activities are not exclusive – participants can engage in various types of matching with one another.



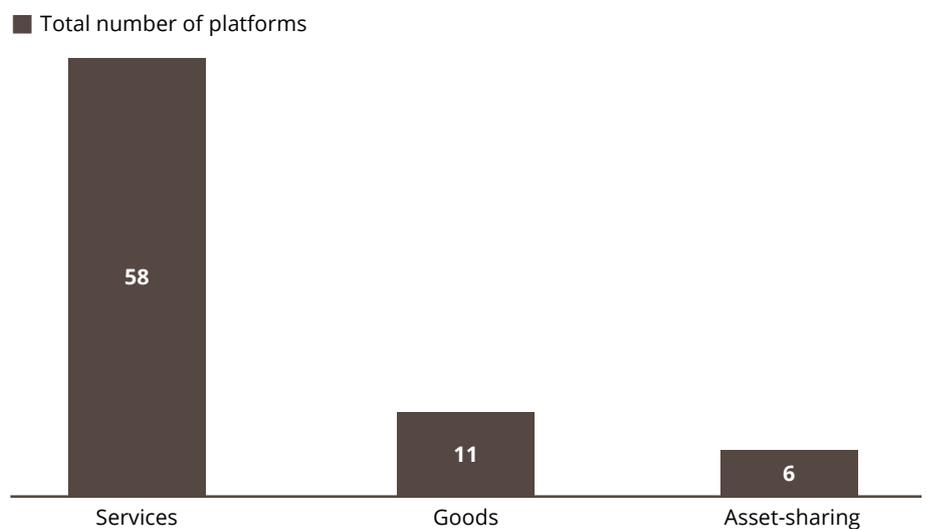
60% of the platforms reviewed in this study are accessible by both mobile phone and web-based applications. In emerging markets, where individuals have higher levels of access to mobile phone than a computer or laptop (Silver, Smith, Johnson, Jiang, Anderson and Rainie; 2019), the share of platforms offering access only via mobile applications is higher than that of developed markets.

Figure 3. Platforms' channel of access per market type



Most (87%) of the construction platforms specialise in the matching of services, e.g. enabling contractors, sub-contractors, workers etc. to be hired to complete specific services/jobs, as opposed to asset-sharing or the sale of materials/tools. Other platforms are engaged with facilitating the sale of construction materials/tools (e.g. bricks, hammers, paint etc.) or the renting out of assets, specifically heavy equipment. There is significant opportunity for asset-sharing platforms in the construction sector, given the low rates of asset utilisation characteristic of the industry: contractors' equipment sits unused 70% of the time (Giesing, 2017).

Figure 4. Types of platform activities (multi-tagged)

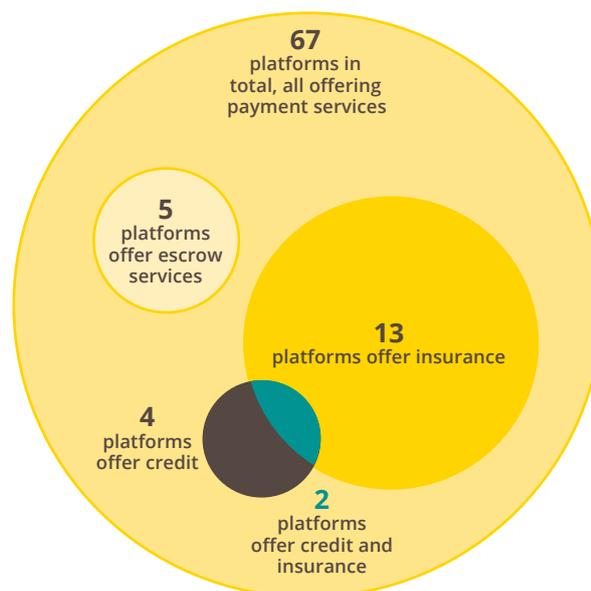


4. The role of financial services in platform participant livelihoods

Payment services were offered by all platforms with other financial services less common. We found only 20 platforms (30%) that offer financial services that go beyond payment services. In the case of insurance, we identified 13 construction platforms (19%) that distribute insurance products to platform participants in partnership with insurers. Only 4 platforms (6%) were found to provide some type of credit product and no platforms were found to offer savings products for their users.

Construction platforms that offer financial services – outside of payments – operate predominantly in established markets (the United States and Europe), while only one platform offering insurance operates in Africa (Nigeria). A few platforms which operate in more than one country offer insurance, in which case they had more than one financial partner to provide products to users in each location.

Figure 5. Financial services offered by construction platforms



Payment services

Digital wallets were prevalent across platforms operating in the construction sector. Examples include Skrill, Kiwi Wallet and supporting payment gateways, which were found to be common across the platforms we reviewed in the global construction sector. TaskRabbit, for instance, makes use of Braintree, a payments gateway with a service known as “Marketplace”, which essentially handles the end-to-end flow of the money being moved and keeps the money until the task has been completed (Perez, 2013). This offers additional security to all platform participants by ensuring that both parties adhere to the transaction, in turn building trust and adding significant value to all users on the platform.



Payment services, notably escrow accounts, also add significant value to all the platform participants by mitigating many of the payment challenges found within the sector, such as delayed/partial payments or a failure to pay. Out of 67 construction platforms, we identified five that offer escrow services. These escrow services (see Box 2) allow for tranche payments to be handled more efficiently as parts of a job are completed to the consumer's satisfaction. In addition, digital escrow tools are of importance for facilitating trust between consumers and suppliers of goods and services: they provide greater certainty to freelancers that the price for their work will not change and that they will be paid soon after their assignments are completed (PYMNTS, 2019). iBuild, for example, overcomes a significant market failure in Kenya through their digital wallet and escrow service, by reducing payment uncertainty and allowing participants to safely store and access their funds. More than 70% of the iBuild platform users interviewed⁷ reported late/no payments as a challenge to their business operations. This is a pertinent risk faced by individuals/businesses working in the construction sector and, if not handled effectively and expeditiously, will have a negative effect on the sustainable growth and development of the industry (Construction Review Online, 2016).



Third-party liability cover adds value for providers and consumers on the platform and acts as an incentive for participants to join by reducing the risk of exchange that takes place.



Box 2: Definition of an escrow account

Escrow payment mechanisms allow a buyer to submit a payment into a secure account on the platform that, after verification, sends a notification to the seller that funds have been secured "in escrow". The seller is then authorised to send the goods or complete the services, and once these have been verified and the buyer is satisfied with the goods/services, the funds are released to the seller. Escrow solutions are widely used in the real-estate market to hold funds for property-based transactions until both parties are satisfied with the terms and costs (PYMNTS, 2019).

Insurance services

Of the platforms providing insurance, more than half offer third-party liability cover⁸. Third-party liability cover adds value for providers and consumers on the platform and acts as an incentive for participants to join by reducing the risk of exchange that takes place. A key benefit is that it protects workers from liability due to risks related to physical loss or damage that may happen to the property, machinery or work done on the site. Third-party damage was found to be a common risk faced according to a survey conducted by AIG (2018) amongst freelance workers in the US. Third-party liability insurance also makes it easier for the person who suffered injuries/damages to recover money from the insured/insurer, thus giving them peace of mind. Insurance also acts as a recourse mechanism to instil trust between platform participants which protects the platforms' brand and encourages use. According to Lloyds (2018), more than 70% of consumers surveyed across⁹ the UK, US and China said they would be more likely to share an asset or service online if they knew insurance protection was in place.

⁷ We conducted a survey with Kenyan contractors and building material suppliers who are using iBuild (N = 55).

⁸ The second-most common type of insurance offered by construction platforms was found to be personal accident insurance for workers.

⁹ The survey was conducted among 5,000 consumers.



The platforms offer a variety of insurance and insurance models.

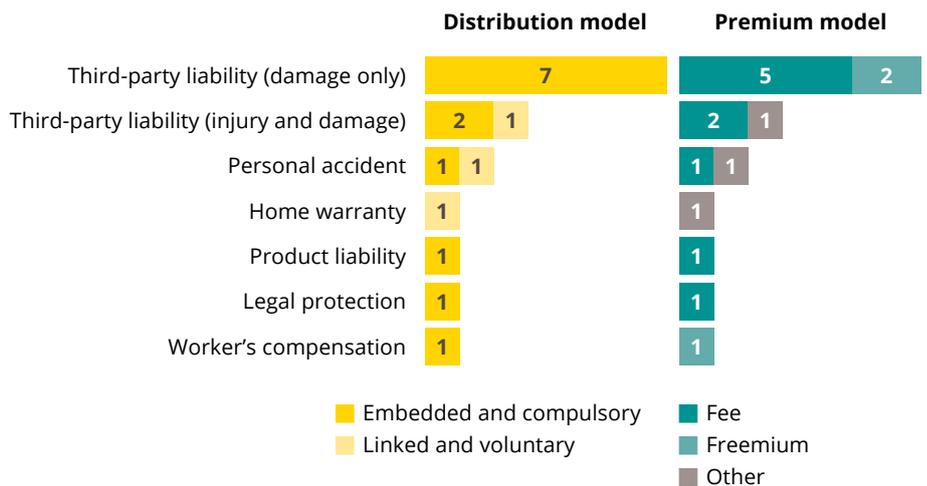
Box 3 provides an overview of the insurance models, and Figure 6 provides a breakdown per insurance product type. Ten of the 13 platforms that offer insurance make use of an embedded-compulsory distribution model, making it the most common type of distribution model in this context. This type of model reduces customer friction, as the platform directly takes up and manages the insurance policy on behalf of platform participants, instead of participants managing the policy themselves.

Box 3: Characteristics of insurance distribution models

The distribution model refers to the mechanism by which construction platforms make insurance products accessible to users for uptake. Our previous platform research identified four distinct models (Dunn et al., 2019):

1. **Embedded voluntary:** An insurance product that is distributed and paid for through the platform and is optional for participants to take up while engaging on the platform.
2. **Embedded compulsory:** An insurance product that is distributed and paid for through the platform and is mandatory for participants to take up while engaging on the platform.
3. **Linked voluntary:** An insurance product that is not paid for through the platform and is optional for participants to take up while engaging on the platform.
4. **Linked compulsory:** An insurance product that is not paid for through the platform and is mandatory for participants to take up while engaging on the platform.

Figure 6. Insurance product types by distribution model and premium model



Voluntary insurance products are uncommon on construction platforms:

Only three platforms offer voluntary and linked insurance products where participants have the option to purchase insurance coverage and can select specific insurance plans. For instance, Airtasker partnered with an insurance underwriting company called Roobyx who offer voluntary personal accident insurance plans for the Airtaskers. Taskers (i.e. workers) can choose to opt in to this insurance at their own cost (USD7 to USD17 per week), which covers them



while performing tasks and travelling to and from the task location. Taskers can choose to be insured only while they work, or they can choose full cover that includes time spent outside of their tasks.

Case Study 1

klarx

Klarx is an online platform for renting construction tools and equipment. The platform has created value in Germany's construction sector by simplifying the rental process for consumers and equipment suppliers. Klarx aggregates suppliers, providing consumers with simple, accessible information on equipment availabilities, making it easier for them to compare prices and assess quality from a large and fragmented pool of local suppliers.

Klarx partnered with HDI insurance to create a unique insurance solution to cover accidental damages to equipment rented via the platform. Through an embedded-compulsory distribution model, individuals and SMEs are automatically covered against accidental damage to rented equipment. Klarx manages the policy and pays for the insurance by incorporating the cost into the commission they charge on each rental.

This type of insurance offering was made possible through Klarx's vertically integrated platform model. Klarx sources and rents the equipment from various suppliers (SMEs) and acts as the point of sale/contact for the consumers who select equipment from a specific class of machinery (e.g. forklifts). This allowed them to purchase an insurance policy on behalf of all renters. In addition, the claims process that Klarx manages on behalf of renters is completely digital, which significantly improves the efficiency with which claims can be submitted and assessed and reduces claims management costs.

Most platforms charge a fee for insurance, either as a flat fee or a percentage of each transaction. For most platforms who charge a fee, the consumer pays¹⁰ and the platform/provider holds the policy, even though the benefits accrue to all parties (the provider, the consumer and the platform). For example, platform providers on Homee can purchase short-term insurance plans where the premiums are based on a daily rate that varies based on location and the type of work being completed, and these premiums are directly deducted from a job's earnings. Freemium insurance models are also emerging. Three platforms use a model where the platform pays for and distributes the insurance at no additional cost to the participants. For instance, Klarx provides "free" insurance to its users by incorporating the cost of the policy into the commission it charges on each rental. Two platforms offer insurance products under more standard payment terms (e.g. excess payable).

Insurance offerings by platforms are value-added but are limited in terms of participant and risk coverage. We find that the insurance offerings only cover a number of "hazard risks", leaving various gaps in coverage (see Figure 7). Risk coverage may be limited given that other categories of risks are more difficult to insure. For example, certain assets in the sharing economy – such

¹⁰ Only two platforms in the study are found to charge both parties.



as trust and reputation – are often intangible, and ownership and responsibility are often fragmented (Lloyds, 2018). Moreover, most of the insurance product offerings cover peer-to-peer transactions between individuals and micro-enterprises (e.g. freelance workers and homeowners), who are less likely to have their own coverage in place than businesses that are transacting on the platform.

Almost no platforms offer products common to formal employee relationships. Platform workers are typically not recognised as employees in the traditional sense. As a result, they are generally not offered employer-sponsored insurance schemes, nor are they protected by government-mandated social programmes (AIG, 2018; ILO, 2018). Only one construction platform that operates in North America was required by law to provide worker's compensation insurance to its participants.

Case Study 2

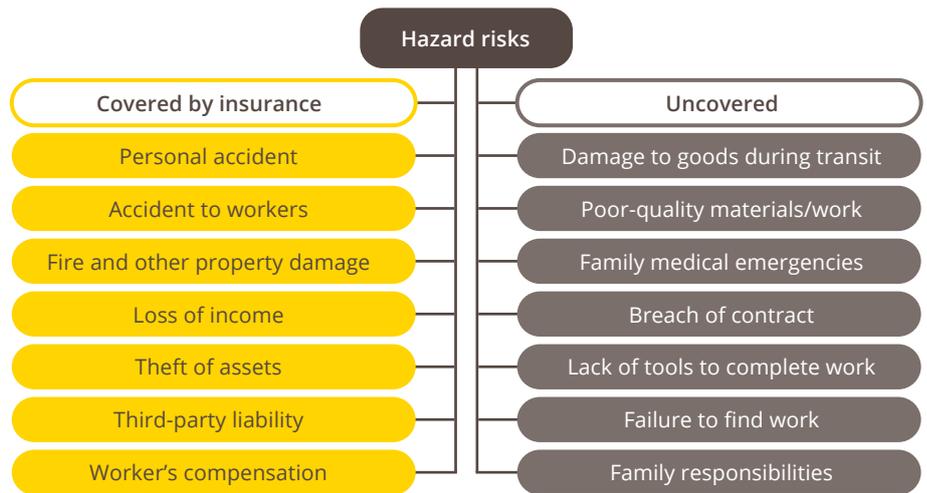
GRAFTER

Grafter is a digital platform designed for businesses that seek short-term workers in the building and construction trade. The platform acts as a centralised database for businesses to source employment online and for workers to gain access to a larger pool of potential employers. This reduces employment costs for businesses and improves the timing of labour matching, with over 10,000 workers and clients having been matched since 2017.

Independent workers participating on the Grafters platform typically take on high levels of personal risk, yet don't have access to the benefits typically provided to full-time employees (e.g. workers compensation) to help manage these types of risk. Traditional insurance also tends to be available in annual policies and is often too expensive and cumbersome for independent workers to take up given the short-term nature of the contracts they are engaged in. To overcome these challenges, Grafters partnered with Zego insurance to create a suitable, embedded-compulsory insurance solution for the grafters on a job-by-job basis, to cover compensation claims and legal costs arising from accidental property damage or injuries to third parties. Premium payments are included in the 10% platform fee, which is automatically added when clients contract workers on the platform. The client takes on the cost of the platform fee, but the policy still covers the worker, which is then paid by Grafters to Zego at the end of each month. In addition, Grafters offers value-added services to help business manage their hires, such as tracked messaging, digital contracting, reminder emails and a cashless payment system. Workers have access to a free, online CV builder tool and online training, which supports workers in improving their skills offering.



Figure 7. Risks covered by insurance product offerings on platforms



Credit services

Credit is not a common offering of platforms in the construction space:

Only four platforms¹¹ that operate in North America were found to offer credit options. These credit products allow consumers, whether they be individuals or businesses, to finance the purchase of goods or service, or the rental of equipment, via the platform¹². For example, BigRentz and DOZR offer loans to finance equipment rentals, while Fixd allows homeowners to access credit to finance the repair/replacement of their heating/cooling systems. The platforms typically allow for loans to be repaid by debit/credit card, bank transfers, online (through the platform) or via cheque. BigRentz has a unique payment method through a partnership with Kabbage, a financial technology platform, which allows small businesses to access credit online¹³. Kabbage simplifies the loan repayment process by automatically withdrawing the minimum payment from your primary account each month. It also allows the lender to make manual payments towards their balance at any time.

Credit is often geared towards customers (e.g. homeowners/property developers), with no credit products offered for suppliers/providers (e.g. workers, suppliers or contractors) on the platforms.

We identified this as a key gap in the market, and extending credit to suppliers and providers could unlock productive opportunities for businesses, especially MSMEs who struggle to access credit solutions. That said, even though the credit products are only available to consumers, benefits commonly accrue to both parties since credit enables consumers to purchase goods/services, thereby creating a more regular demand/income stream for providers.

The lack of credit offerings by platforms can be partly attributed to the low number of platforms that facilitate the sale or sharing of assets.

We only found six platforms that are involved in sharing or selling assets – therefore, there is limited collateral to be offered to facilitate the supply of credit to platform participants. While digital transactions could be used as an alternative (i.e. to digital credibility), this only becomes viable if a sufficient part of the participants' transactions occur via the platform.

¹¹ Amazon also offers credit, whereby store cardholders can buy goods now and pay over a period with a variety of promotional financing options. However, this is a generic form of credit, which is available on most online shopping platforms and is thus excluded from the analysis above.

¹² We expect credit offerings to be limited, since there are few asset-sharing platforms in the construction industry.

¹³ All business loans are issued by Celtic Bank.



Case Study 3



Wesabi finds affordable, trained and thoroughly vetted workers for both domestic and commercial needs. It overcomes a key market constraint in Nigeria, namely the difficult and onerous process of finding reliable skilled workers. To facilitate this process and increase trust between parties on the platform, Wesabi partnered with Mutual Benefit to provide embedded-compulsory insurance that covers accidental damage to, or theft of, property. Wesabi pays for the insurance, which is provided on a job-by-job basis.

To further facilitate trust between consumers and workers, Wesabi conducts background checks before the worker can accept jobs on the platform (verify skills offerings, etc.) and has partnered with the Builders and Construction Skilled Artisans Association of Nigeria (BACSAAN), which recommends artisans to the platform (Jackson, 2016). In addition, Wesabi adds additional value to consumers by giving them the option to select various annual maintenance subscriptions. These automatically cover home repairs through pre-scheduled callouts from service providers to check for repairs.

Expanded credit offerings by platforms could incentivise platform participation given credit constraints in the market. Access to credit is cited as a key challenge to the construction industry, leading to a high failure rate of construction companies (Nhabinde et al., 2012; Balogun et al., 2018; CIDB, 2011). Access to credit is therefore likely to increase the value proposition for individuals and businesses to join the platform, and we think that credit solutions can be especially beneficial to gig-workers who will experience periods of high and low activity and will need access to finance and productive resources to help smooth volatility in income flows.



Other services

Several value-added (not necessarily financial) services are available to platform participants. In many cases, these mechanisms provide alternative ways for platforms to manage risks and protect their intangible assets such as trust, or reputation. In this study, 16 construction platforms were found to offer additional services to their users, the most common being a satisfaction guarantee. Value-added services were found to be predominantly geared towards consumers and are summarised as follows:

- **Satisfaction guarantee:** Six platforms offer their customers a satisfaction guarantee. Fixd Repair is a modern home service company that allows homeowners to book a professional online (via the app) to manage home repairs and maintenance. Each service comes with a satisfaction guarantee, so that if homeowners are not satisfied with the performance of the service, Fixd will either seek to fix the problem at its expense or reimburse the homeowner for the amount they originally paid for the service (limited to USD10,000).
- **Referral benefits:** Two platforms offer benefits to platform participants who refer new customers to the platform. Truelancer pays USD10 to platform providers who get a new client to sign up, while Handy offers discounts to consumers who invite other people to join.
- **Payment/pricing benefits:** Two platforms offer payment/pricing benefits, such as a competitive price guarantee whereby the platform will match the price of (a) service(s) if a lower price can be found for the service(s), and another platform which allows consumers to pay in instalments.
- **Credits:** Two platforms offer credits to users: Handy gives credit to users when they cancel a booking that has already been paid, instead of a refund, while Truelancer allows consumers to use 10% of the total payment for the service as cash credits to be spent on the platform.
- **Warranties:** Two platforms offer a warranty period within which they agree to repair any items that are defective due to faulty workmanship on the part of the platform providers.
- **Damage guarantee:** Two platforms offer a damage guarantee, within which they agree to fix any damages that occur to a consumer's personal property due to faulty workmanship on the part of the platform providers. Porch pays an amount of up to USD1,000 to offset any losses incurred, while NoSweat is liable for 50% of the payment made for the service.

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In this study, 16 construction platforms were found to offer additional services to their users, the most common being a satisfaction guarantee.

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Platforms also enhance trust between participants through user rating systems, and 85% of the platforms included in the study were identified to provide a rating system. User rating and review functions allow consumers to rate providers and facilitate matching of participants. Other trust-building mechanisms include setting basic requirements for providers to join the platform and offering centralised customer support services (OECD, 2019).

Construction platforms also offer integrated technologies that target business operations. Several platforms have an interactive dashboard, which allows providers to manage their workers, streamline material/equipment procurement and track deliveries. These types of dashboards increase speed and efficiency, especially for MSMEs who often lack the technical capacity to manage their



resources. In addition, several construction platforms that operate in the supply phase of the value chain offer GPS tracking on equipment and/or materials.

- Klarx found that smaller suppliers often lacked their own fleet management capabilities/resources, which made it difficult for them to track the equipment. To overcome this, Klarx created a supplier and hauler database to manage the equipment rentals and created a mobile app to match available equipment with haulers and to track the equipment while it is in transit. In addition, Klarx developed a dashboard for their suppliers, which allows them to view and plan their projects, track their equipment, and manage their tasks, invoices and price list. This streamlines the logistic processes, enables suppliers to better manage their fleets and allows Klarx to receive information on the availability of the machines.
- Trux employs geofencing technology to allow construction material suppliers additional insights into streamlining their operations. In addition, they offer cycle-time reporting that allows providers to measure and manage turnaround time for their jobs, and they use the data they have on each business to generate insights on performance, all of which is easily accessible to the producers.
- The ODTap “super-admin” portal allows providers to manage all their business operations on one device. It has an interactive dashboard to track payments and develop business analytics/insights. They also offer a separate platform for service providers with job scheduling features, automated reminders and task monitoring.
- Billd offers a payment solution that gives contractors access to funds with terms that mirror their repayment cycle (i.e. option to repay within 120 days). In the meantime, Billd pays suppliers directly, on behalf of contractors, for construction material purchases. This mitigates construction delays and eases financial constraints.

5. Incentives for platforms and financial services to partner

Our analysis of partnership case studies highlights that partnerships between digital platforms and FSPs result in more value creation for platform participants through fit-for-purpose financial services.

Incentives for FSPs to partner with construction platforms

- **Digital aggregator of clients:** construction platforms aggregate a large consumer base, allowing FSPs to reach a greater audience by leveraging on the scale achieved by platforms. In addition, FSPs capitalise on the platform brand and trust which the platform has already established with the consumers (Smit et al., 2019).
- **Inbuilt communication:** platforms leverage inbuilt communication features to enable engagement with the different user groups. This enables them to push relevant messaging to the different user groups on the platform. FSPs can leverage this same channel to market or sign up new clients through linked or embedded products on the platform.
- **Digital payment mechanism:** distributing financial services via platforms is cost-effective and efficient, as FSPs can utilise the digital infrastructure that platforms have established, and the wide variety of payment mechanisms they allow for (Smit et al., 2019).
- **Decision proximity to construction related transactions:** platforms collect valuable demographic and transactional data on their users' behaviours. This data enables them to have a more accurate, real-time measure of the risk exposure looking forward. In addition, FSPs will be able to better understand potential customers by leaning on the (big) network data that platforms own (Smit et al., 2019).

Incentives for platforms to offer financial services

- **Trust:** Platforms can benefit from distributing financial services, by leveraging them to build trust and certainty with regard to payments and making sure that certain risks that emerge during the matching activities are mitigated (e.g. sudden cancellations, poor quality work), thereby increasing participation on the platform. According to Lloyds (2018), more than 70% of individuals from a survey of 5,000 consumers across the UK, US and China said they would be more likely to share an asset or service online if they knew it/they were protected by insurance. In addition, offering credit products can add value for participants by helping businesses manage their liquidity and workers/individuals smooth their income. It is thus likely to increase the value proposition for individuals and businesses to join the platform.

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- **Ecosystems:** By offering financial services, platforms can also build an ecosystem that offers broader value to the participants. The platform can take on this role through provision of value added services to claim a greater share through the network effect. This allows them to be more attractive to a broader set of participants and diversify their revenue stream while ensuring the resilience of existing participants.
- **Revenue:** Offering financial products provides platforms with the opportunity to earn more revenue. Financial service products could offer platforms a potential additional form of revenue through commissions earned on transactions between their users and the FSPs providing them on the platform.
- **Participants:** Platforms can improve their chances of attracting and retaining participants on the platform by offering financial and value-added services to grow the core business, through discounts and better terms. Platforms can negotiate more favourable terms and pricing of financial products with financial service providers on behalf of the network, since they aggregate a large client base. This further increases the value of participation for platform participants.

6. Conclusion

Platforms provide a critical role of matching various participants across the construction value chain and are best placed to deliver on financial needs of liquidity and risk management. For instance, payment issues facing the construction industry are being resolved through innovative solutions such as digital wallets and escrow services that platforms provide. In addition, platforms monitor and uphold the quality of the exchanges that take place on the platform, ensuring that users are satisfied with the services being provided. In some cases, satisfaction/damage guarantees have been offered which helps participants better manage personal and commercial risks. However a number of opportunities remain to better meet platform participant needs and build stronger partnerships between platforms and financial service providers to make both more effective.



There is significant opportunity for insurers to design appropriate products: financial services that enable a broader set of participants to manage risks, which would increase the value proposition for individuals and businesses to join the platform.



Insurance product offerings are limited in terms of participant and risk coverage, due to the unique nature of the risks that emerge from participating on platforms; the type of activities within the industry and confusion around who should be responsible for managing these risks. There is significant opportunity for insurers to design appropriate products: financial services that enable a broader set of participants to manage risks, (e.g. social protection, insurance for business risks), which would increase the value proposition for individuals and businesses to join the platform. Credit solutions are nascent but exist as a key opportunity to ease liquidity issues and can be especially beneficial to workers who experience periods of income volatility. Moreover, participant data collected by platforms could enable credit institutions to build credit risk profiles based on user's transactional behaviour.

Beyond financial services, platforms have been innovative in creating other value-added services for construction workers and suppliers that supports growth of the network as a whole. Platforms have introduced additional services to help platform participants manage risk, for instance through damage/satisfaction guarantees and warranties. Platform participation is also stimulated through pricing and referral benefits, and several construction platforms offer integrated technologies, which enable users to better manage business operations. These not only allows participants to become more resilient; they also enable them to grow.

There are various incentives for platforms to partner and develop new products for participants. For financial service providers, partnering with construction platforms allows them to reach a greater audience by leveraging the scale and trust achieved by platforms. Partnerships with platforms also supply FSPs with relevant data on trends to enable them to distribute financial services in a more cost-effective manner. However, partnership cases have so far been found to be limited in the construction sectors of developing countries.

7. Appendix

Methodology for the systematic review of construction digital platforms

7.1 Data collection

a. Search criteria and duration of study

Between July and November 2019, we undertook a global, but not exhaustive, systematic review to identify multi-sided digital platforms that are operational in the construction sector. These platforms could be construction-specific, or freelance platforms with building-specific services. Data were primarily collected via desktop research (web-searches) and where data were not readily available, additional information was collected via email and/or telephonic interviews with platforms. To ensure consistency in the search strategy across countries, we used a list of defined search terms to find and populate data on platforms operating globally. The search terms were structured to identify cases that include the following three terms: platform type, digital (virtual) platforms and type of platform, as shown in Figure 8.

Data on active platforms were primarily sourced from platforms websites and supplemented by publicly available social media sources (e.g. LinkedIn, Facebook, Instagram and/or Twitter). Where available, platform applications in Google Play and Apple's App Store were scanned for information. Select platforms were also contacted via email, and informant interviews conducted in the period between October to December 2019 to supplement the data, particularly for platform attributes that were not commonly available online.

Figure 8. Search terms



b. Information collected

We captured a range of characteristics for each of the platforms identified. Table 2 shows the variable under which the information was captured and a short description of each variable. Entries were often multi-tagged or captured under more than one category where applicable, e.g. a construction-specific platform that is categorised as offering services, may be simultaneously categorised as providing goods if this platform distributes both products/goods and services. Similarly, on payment methods, a platform can offer a combination of various payment methods, e.g. card, cash and a digital wallet.

Table 2. Information captured for each construction platform

Variable	Description
Platform name	The name of the platform
Country of operation	Country of origination
Country/countries of operation	Countries in which the platform operates
Economic status	Classifies a platform as operating in an emerging or developed market, or both, based on World Bank classifications
Launch year	Year in which the platform launched
Self-description	Short, self-reported description of the platform, extracted from the website/ social media page
Web link	Link to website/application
Classification	A narrow classification of the platform across two categories: whether they are engaged in construction-specific activities, or a freelance platform with construction-specific activities
Platform type	A broad classification of the platform across the categories of services, goods or asset-sharing
Value chain phase	Where the activities of the platform are situated across the construction value chain
Number of value chain components	How many phases of the value chain the platform operates in
Number of users	The number of individuals who are using the platform (if available)
Types of users	The different types of participants on the platform, classified according to the activities set out in the value chain
Matching	The activities that are “matched” on the platform
Payment methods	The payment methods available to consumers on the platform
Access	How participants access the platform, e.g. web-based, mobile application or both
Rating services	Whether the platform offers rating services
Financial services	Whether the platform offers financial services – insurance, credit, savings and/or escrow account
Value-added services	Whether the platform offers additional value-added services – payment gateway, incentives, additional non-financial features



7.2. Data collation and database format

The information we found on each platform was collected in an excel database. This data was then aggregated across the different countries of operation and concatenated per variable. This method was expanded to variables of interest such as payment methods and financial services, to produce data-informed insights on platform offerings and services.

Box 4. Components of the construction value chain

The construction value chain describes the relationships between actors that are involved in the delivery of building and building-related services and represents how construction activities are organised (Gloser et al. 2017). There are four main phases in the construction value chain:

- **Phase 1: Preparation and design**

This phase involves all organisations and users involved in defining the project/building in terms of function/purpose, scope, size, economics and the design. Users typically involved in this phase include architects, engineers and other technical services such as land or quantity surveyors.

- **Phase 2: Execution**

Organisations and users involved in physically constructing what the design team has stipulated in its documentation and specifications. This includes users involved in supplying building materials, tools and equipment, as well as transporting these goods to the site. Users most commonly involved in these activities include the main contractor, who procures the people, materials and services required and manages the process, liabilities, obligations and risks of the project. The contractor typically employs various workers who carry out physical tasks, e.g. bricklaying on the site as well as sub-contractors appointed to complete specialist activities, such as roofing, steelwork, plumbing or electrical services. Lastly, there can be consultants who are appointed by the client to perform expert tasks on a project. Examples include a site engineer who performs a technical, organisational and supervisory role on construction sites.

- **Phase 3: Use**

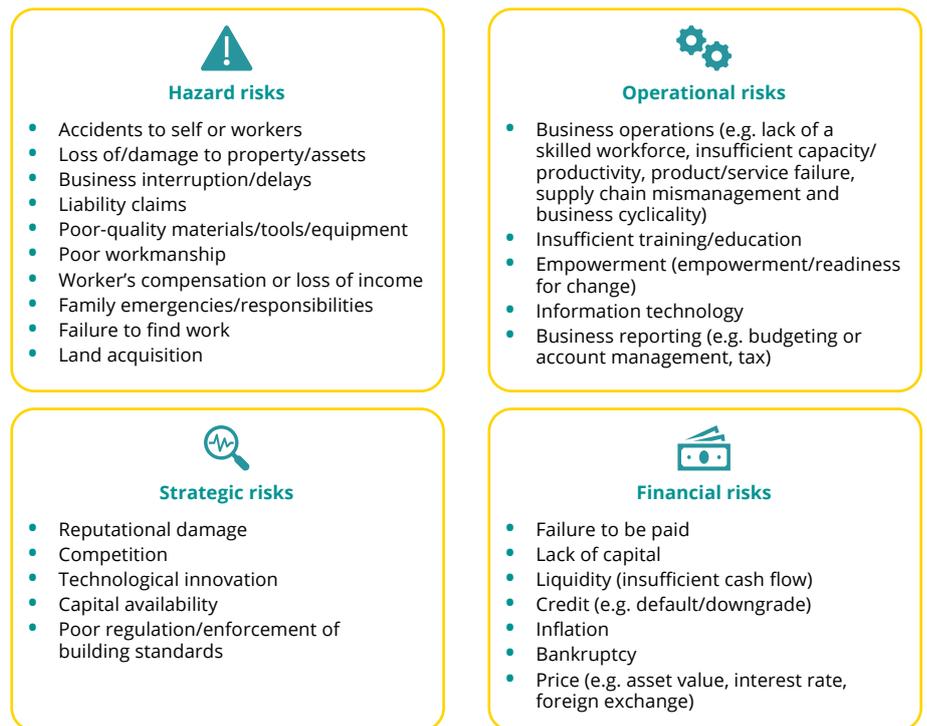
Organisations and users involved in defining the occupation/use and maintenance of the building, including repairs and renovations. Many of the users involved in the execution phase are also involved in undertaking maintenance and renovation activities. Sub-contractors might be required to complete certain repairs, or in the case of larger renovation projects a contractor and workers might be required to fulfil all the tasks.

- **Phase 4: Demolition**

Organisations and users involved in the demolition or renovation of a building, usually undertaken by specialist sub-contractors (demolition experts) or companies, depending on the size of the building.



Figure 9. Risk typology



Author's own, with input from CAS, 2003

Box 5: Examples of risks faced

- **Hazard risk:** A homeowner hires a plumber to fix their broken sink. In the process, the plumber accidentally breaks a pipe which causes significant water damage to the homeowner's property.
- **Operational risk:** A contractor orders several bags of cement from their supplier; however, due to heavy rainfall and negligence on the part of the supplier, the cement was gets ruined. This causes a delay in the construction process.
- **Strategic risk:** Labour activists accuse a major construction company of mistreating their workers, causing negative publicity for the company and damaging the company's reputation.
- **Financial risk:** A builder is hired by a contractor to lay bricks for the construction of a house. After the builder completes the work, the contractor is unable to pay the worker due to cash flow mismanagement.

Box 6: Overview of platform participant matching activities

We identified five types of user matching across our global scan of construction platforms. These can be described as follows:

Homeowners and workers: Platforms that connect homeowners with professional workers, e.g. an architect to design a home plan, or sub-contractors who perform specific activities such as repairing a broken roof or replacing a floor.

Homeowners and contractors: Platforms that allow homeowners who want to build a new home, or undertake a large home renovation, to connect with contractors to facilitate and manage the building process.

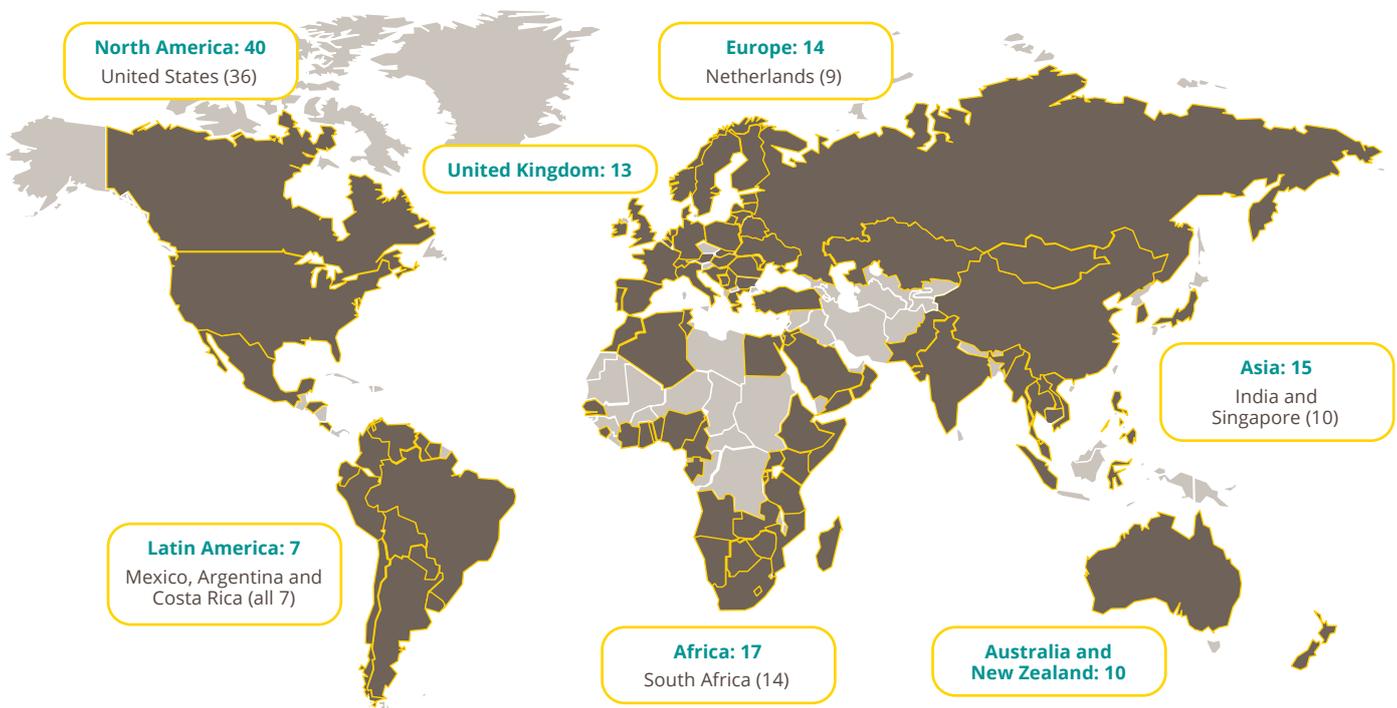
Contractors and workers: Platforms that allow contractors to connect with workers – These workers range from being general labourers (e.g. bricklayers) or professional workers (sub-contractors) who are required to perform activities during the execution or use phase (in the case of larger renovation projects) of the value chain.

Homeowners and suppliers: Platforms that allow homeowners to find suppliers and purchase supplies (materials and/or equipment) for their construction, repair or renovation project.

Contractors and suppliers: Platforms that allow contractors to find suppliers and rent/purchase supplies (materials and/or equipment) for their projects – In addition, contractors can connect with logistics firms that are involved in the delivery and logistics (warehousing, storage) of all construction-related materials and/or equipment.

Workers and suppliers: Platforms that allow professional workers (e.g. sub-contractors, plumbers or electricians) to find suppliers and purchase supplies (materials and/or equipment) for their construction, repair or renovation project.

Figure 10. Overview of the markets in which construction platforms operate



8. Bibliography

- African Development Bank. 2018. Chapter 3: Africa's infrastructure: great potential but little impact on inclusive growth. In African Economic Outlook. Available at: https://www.afdb.org/fileadmin/uploads/afdb/Documents/Publications/2018AEO/African_Economic_Outlook_2018_-_EN_Chapter3.pdf
- AIG. 2018. Insuring the sharing economy. Available at: <https://www.aig.com/content/dam/aig/america-canada/us/documents/insights/aig-insuring-the-sharing-economy.pdf>
- Allaire, N., Colin, N., Palier, B., Tran, L. 2019. Covering risks for platform workers in the digital age. Available at: <https://www.sciencespo.fr/public/chaire-numerique/wp-content/uploads/2019/05/covering-risks-plateform-workers-digital-age.pdf>
- Artradius. 2018. Market Monitor: Focus on Construction Sector Performance and Outlook. Available at: <https://group.atradius.com/documents/atradius-market-monitor-construction-feb2018-mm0218en.pdf>
- ASK-EHS. 2019. MSMEs in the Construction sector. Available at: <https://www.ask-ehs.com/blog/safety/msmes-in-the-construction-sector/>
- Balogun, O., Agumba, J. and Ansary, N. 2018. Evaluating credit accessibility predictors among small and medium contractors in the South African construction industry. Available at: <https://www.ajol.info/index.php/actas/article/view/180640>
- Brown, A. 2019. Construction recovering in Latin America. International Construction. Available at: <https://www.khl.com/international-construction/construction-recovering-in-latin-america/139800.article>
- Buckley, M., Zendel, A., Biggar, J., Frederiksen, L. and Wells, J. 2016. Migrant Work & Employment in the Construction Sector. ILO. Available at: http://ilo.org/wcmsp5/groups/public/---ed_protect/---protrav/---migrant/documents/publication/wcms_538487.pdf
- Casualty Actuarial Society. 2003. Overview of Enterprise Risk Management. Available at: <https://www.casact.org/area/erm/overview.pdf>
- Chen, Y. and Ryan Woo, R. 2019. China's growth slowed by service, farm sectors, despite construction rebound. Reuters. Available at: <https://www.reuters.com/article/us-china-economy-gdp/chinas-growth-slowed-by-service-farm-sectors-despite-construction-rebound-idUSKCN1PG0A2>
- CIDB. 2011. The CIDB Construction Industry Indicators Summary Results. Available at: <http://www.cidb.org.za/publications/Documents/Construction%20Industry%20Indicators%20Summary%20Results%20-%202011.pdf>
- Construction Industry Development Board. 2018. Annual Report (2017/2018). [online]. Available at: <http://www.cidb.org.za/publications/Documents/Annual%20Report%202017-2018.pdf>
- Construction Review Online. 2016. Construction sector in South Africa gets new payment regulations. Available at: <https://constructionreviewonline.com/2016/06/construction-sector-in-south-africa-gets-new-payment-regulations/>



Cremers, J. 2017. Undeclared work in the construction industry: Background paper – European platform undeclared work – Construction seminar. In Seminar reader Brussels. Available at: https://pure.uvt.nl/ws/portalfiles/portal/16387039/Background_Paper_Construction_Seminar_3May17.pdf

Cremers, J., Williams, C. C., Hawley-Woodall, J. and Nikolova, N. 2017. Tackling undeclared work in the construction industry: A learning resource European Commission. Available at : <https://ec.europa.eu/social/BlobServlet?docId=18132&langId=en>

De Croo. 2016. Belgian Government Approves Simple and Low Tax Rates for Sharing Economy. Available at: <https://www.decroo.belgium.be/en/belgian-government-approves-simple-and-low-tax-rates-sharing-economy>

Dobbs, R., Pohl, H., Lin, D., Mischke, J., Garneo, N., Hexter, J., Matzinger, S., Palter, R. and Nanavatty, R. 2013. Infrastructure productivity: How to save \$1 trillion a year. McKinsey Report. Available at: <https://www.mckinsey.com/industries/capital-projects-and-infrastructure/our-insights/infrastructure-productivity>

ENGcranes-USA. 2019. Asia Pacific, a Growing Construction Market. Available at: <http://engcranes-usa.com/archives/620>

Evans, P. C. and Gawer, A. 2016. The Rise of the Platform Enterprise: A global survey. Available at: https://www.thecge.net/app/uploads/2016/01/PDF-WEB-Platform-Survey_01_12.pdf

Garben, S. 2017. Protecting Workers in the Online Platform Economy: An overview of regulatory and policy developments in the EU European Risk Observatory Discussion paper. European Agency for Safety and Health at Work. Available at: <https://osha.europa.eu/el/publications/protecting-workers-online-platform-economy-overview-regulatory-and-policy-developments>

Gesing, B. 2017. Sharing Economy Logistics: Rethinking logistics with access over ownership. Available at: https://www.dhl.com/content/dam/downloads/g0/about_us/logistics_insights/DHLTrend_Report_Sharing_Economy.pdf

Global construction perspectives and Oxford Economics. 2016. Global Construction 2030. Available at: https://policy.ciob.org/wp-content/uploads/2016/06/GlobalConstruction2030_ExecutiveSummary_CIOB.pdf

Global Data. 2017. Construction in Brazil – Key Trends and Opportunities to 2021. Overview. Available at: <https://www.globaldata.com/store/report/gd-cn0379mr--construction-in-brazil-key-trends-and-opportunities-to-2021/>

Jakub Gloser, J., Baker, P., Giustozzi, L., Hanzl-Weiss, D., Merkus, E., Molemaker, R. and Stehrer, R. 2017. The European Construction Value Chain: Performance, Challenges and Role in the GVC. Available at: <https://wiiw.ac.at/the-european-construction-value-chain-performance-challenges-and-role-in-the-gvc-dlp-4212.pdf>

Handle. 2019. Why Are Payment Issues Persistent in the Construction Industry? Available at: <https://www.handle.com/construction-payment-issues/>

ILO. 2018. Asia-Pacific Employment and Social Outlook. Available at: https://www.ilo.org/wcmsp5/groups/public/---asia/---ro-bangkok/---sro-bangkok/documents/publication/wcms_649885.pdf

ILO. 2018. Women and Men in the Informal Economy: A Statistical Picture. Available at: <https://www.wiego.org/sites/default/files/migrated/publications/files/Women%20and%20Men%20in%20the%20Informal%20Economy%203rd%20Edition%202018.pdf>



ILO. 2019. Inclusive Future of Work: Republic of South Africa. Available at: https://www.ilo.org/wcmsp5/groups/public/---dgreports/---cabinet/documents/publication/wcms_732871.pdf

Industrial Development Corporation. 2019. Economic overview: Recent developments in the global and South African economies. Available at: <https://www.idc.co.za/wp-content/uploads/2019/05/IDC-RI-publication-Economic-Overview-May-2019-External.pdf>

Invest India. n/d. Construction. Available at: <https://www.investindia.gov.in/sector/construction>

JICA Research Institute. 2013. Development Challenges in Africa: Towards 2015. Available at: https://www.jica.go.jp/jica-ri/publication/booksandreports/jrft3q0000029i2-att/TICAD_Africa_2050_JICA-RI.pdf

Kahn, K. 2019. Gig Economy and its Impact on India. International Journal of Scientific Research and Reviews. 8(2): 3177-3188

KPMG. 2016. Global Construction Survey. Available at: <https://assets.kpmg/content/dam/kpmg/xx/pdf/2016/09/global-construction-survey-2016.pdf>

Levelset. 2019. National Construction Payments Report. Available at: <https://www.levelset.com/blog/2019-national-construction-payments-report/>

Lloyds. 2018. Sharing risks, sharing rewards: Who should bear the risk in the sharing economy? Available at: <https://www.lloyds.com/news-and-risk-insight/risk-reports/library/technology/sharing-risks-sharing-rewards>

Market Research.com. 2019. Brazil Construction Industry Databook Series. [online]. Available at: <https://www.marketresearch.com/ConsTrack360-v4128/Brazil-Construction-Databook-Series-Size-12294371/>

Martens, B. 2016. An Economic Policy Perspective on Online Platforms. Institute for Prospective Technological Studies Digital Economy Working Paper 2016/05. Available at: <https://ec.europa.eu/jrc/sites/jrcsh/files/JRC101501.pdf>

McKinsey Global Institute. 2017. In Brief: Reinventing Construction. Available at: <https://www.mckinsey.com/~media/McKinsey/Industries/Capital%20Projects%20and%20Infrastructure/Our%20Insights/Reinventing%20construction%20through%20a%20productivity%20revolution/MGI-Reinventing-Construction-In-Brief.ashx>

Meisels, M. 2019. 2019 engineering and construction industry outlook. Available at: <https://www2.deloitte.com/content/dam/Deloitte/us/Documents/energy-resources/us-2019-engineering-and-construction-industry-outlook.pdf>

Meisels, M. 2019. 2019 engineering and construction industry outlook. Deloitte. Available at: <https://www2.deloitte.com/content/dam/Deloitte/us/Documents/energy-resources/us-2019-engineering-and-construction-industry-outlook.pdf>

National Bureau of Statistics of China. 2018. China Statistical Yearbook. Available at: <http://www.stats.gov.cn/tjsj/ndsj/2018/indexeh.htm>

National Treasury of South Africa. 2019. Chapter 2: Economic Overview in National Budget Review. 2019. Available at: <http://www.treasury.gov.za/documents/national%20budget/2019/review/Chapter%202.pdf>

Nhabinde, V., Marrengula, C. P. and Ubissa, A. 2012. The Challenges and the Way Forward for the Construction Industry in Mozambique. Available at: <https://www.theigc.org/wp-content/uploads/2014/09/Nhabine-Et-Al-2012-Working-Paper.pdf>



Niazi, S. 2019. India's economic growth rate hits 6-year low. Available at: <https://www.aa.com.tr/en/asia-pacific/india-s-economic-growth-rate-hits-6-year-low/1569405>

OECD. 2019. Employment by Activity. Available at: <https://data.oecd.org/emp/employment-by-activity.htm>

OECD. 2019. Value added by Activity. Available at: <https://data.oecd.org/natincome/value-added-by-activity.htm>

Oladinrin, T. O., Ogunsemi, D. R. and Aje, I. O. 2012. Role of construction sector in economic growth: empirical evidence from Nigeria. *FUTY Journal of the Environment*. Vol. 7(1). <http://dx.doi.org/10.4314/fje.v7i1.4> Department of Quantity Surveying. <https://www.ajol.info/index.php/fje/article/view/82770/72906>

Oxera. 2015. Benefits of Online Platforms. Available at: [https://www.oxera.com/wp-content/uploads/media/oxera_library/downloads/reports/The-benefits-of-online-platforms-main-findings-\(October-2015\).pdf](https://www.oxera.com/wp-content/uploads/media/oxera_library/downloads/reports/The-benefits-of-online-platforms-main-findings-(October-2015).pdf)

Pbctoday. 2019. SMEs working in the Construction Sector in the UK. Available at: <https://www.pbctoday.co.uk/news/planning-construction-news/smes-construction-sector/52120/>

Perez, S. 2013. Braintree Takes on Stripe, PayPal With Debut Of "Marketplace". Available at: <https://techcrunch.com/2013/08/14/braintree-takes-onstripe-paypal-with-debut-of-marketplace/>

PwC. 2014. Developing Infrastructure in Asia Pacific: Outlook, Challenges and Solutions. Available at: <https://www.pwc.com.au/industry/infrastructure/assets/developing-infrastructure-asia-pacific-sep14.pdf>

Rhodes, C. 2018. Construction industry: statistics and policy. House of Commons Library. [online]. Available at: <https://commonslibrary.parliament.uk/research-briefings/sn01432/>

Robinson, G. 2015. Global construction market to grow \$8 trillion by 2030: driven by China, US and India. Press release. Available at: <https://www.ice.org.uk/ICEDevelopmentWebPortal/media/Documents/News/ICE%20News/Global-Construction-press-release.pdf>

Saghir, J. and Santoro, J. 2018. Urbanization in Sub-Saharan Africa: Meeting Challenges by Bridging Stakeholders. Centre for Strategic and International Studies. Available at: <https://www.csis.org/analysis/urbanization-sub-saharan-africa>

Silver, L., Smith, A., Johnson, C., Jiang, J., Anderson, M. and Rainie, L. 2019. Mobile connectivity in emerging economies. Available at: <https://www.pewresearch.org/internet/2019/03/07/use-of-smartphones-and-social-media-is-common-across-most-emerging-economies/>

Smit, H., Johnson, C., Hunter, R., Dunn, M. and Janse van Vuuren, P. 2019. Africa's Digital Platforms and financial services: An eight-country overview. Available at: <https://indd.adobe.com/view/1e02103c-a03b-4aa7-9dae-658152c04400>

Statista. 2019a. Construction spending worldwide. Available at: <https://www.statista.com/statistics/788128/construction-spending-worldwide/>

Statista. 2019b. U.S. Construction Industry-Statistics and Facts. [online]. Available at: <https://www.statista.com/topics/974/construction/>



Statista. 2019c. Value added of the construction industry as a share of gross domestic product in the U.S. from 2007 to 2018. Available at: <https://www.statista.com/statistics/192049/value-added-by-us-construction-as-a-percentage-of-gdp-since-2007/>

Statista. 2019d. Construction industry in Europe – Statistics & Facts. Available at: <https://www.statista.com/topics/5137/construction-industry-in-europe/>

Statista. 2019e. Number of employees in the construction sector in Brazil from 2010 to 2017 (in 1,000s). Available at: <https://www.statista.com/statistics/763495/number-employees-construction-sector-brazil/>

Statista. 2019f. Share of economic sectors in the global gross domestic product (GDP) from 2007 to 2017. Available at: <https://www.statista.com/statistics/256563/share-of-economic-sectors-in-the-global-gross-domestic-product/>

StatsSA.2019. Report-50-02-01- Construction Industry. Available at: http://www.statssa.gov.za/?page_id=1856&PPN=Report-50-02-01&SCH=7673

The State Council for The People's Republic of China. 2019. Major figures from China's 4th economic census. [online]. Available: http://english.www.gov.cn/archive/statistics/2018/09/09/content_281476295331180.htm

The World Economic Forum. 2016. Shaping the Future of Construction: A Breakthrough in Mindset and Technology. Available at: http://www3.weforum.org/docs/WEF_Shaping_the_Future_of_Construction_full_report_.pdf

Trading Economics. 2018. GDP from Construction. Available at: <https://tradingeconomics.com/country-list/gdp-from-construction>

Tunji-Olayeni, P., Mosaku, T. O., Fagbenle, O. I., Omuh I. O., and Joshua, O. 2016. Evaluating Construction Project Performance: A Case of Construction SMEs in Lagos, Nigeria. *Journal of Innovation and Business Best Practices*. DOI: 10.5171/2016.482398. Available: <https://ibimapublishing.com/articles/JIBBP/2016/482398/>

Turner and Townsend. 2018. International construction market survey 2018. Available at: <https://www.turnerandtowntsend.com/media/3352/international-construction-market-survey-2018.pdf>

United Nations. 2018. 68% of the world population projected to live in urban areas by 2050, says UN. Available at: <https://www.un.org/development/desa/en/news/population/2018-revision-of-world-urbanization-prospects.html>

Van der Merwe, M., du Plessis, W., Subban, V., MacKenzie, J., Whyte, K., Yudaken, M., Bell, J. and van Rensburg, M. 2020. The Impact of COVID-19 on Key African Sectors. Available: <https://www.bakermckenzie.com/en/insight/publications/2020/03/the-impact-of-covid19-on-key-african-sectors>

Veiga, M. G. and McCahery, J. A. 2019. The Financing of Small and Medium-Sized Enterprises: An Analysis of the Financing Gap in Brazil. *European Business Organization Law Review*. 20:633–664. <https://doi.org/10.1007/s40804-019-00167-7>. <https://link.springer.com/content/pdf/10.1007%2Fs40804-019-00167-7.pdf>

World Green Building Council. 2019. New report: the building and construction sector can reach net zero carbon emissions by 2050. Available at: <https://www.worldgbc.org/news-media/WorldGBC-embodied-carbon-report-published>

Zhao, J. 2018. Benefits and Perks for Gig Economy Workers. Available at: <https://www.payscale.com/compensation-today/2018/09/gig-workers-benefits>

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