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WIDER Working Paper 2018/119

The role of the construction sector in Ghana

Nkechi Srodah Owoo¹ and Monica P. Lambon-Quayefio²

September 2018

Abstract: The research explores the structure and performance of Ghana's construction subsector, in light of the country's 2007 oil discovery. Using primary and secondary data resources, we discuss how marginal costs and expenditure shocks may vary within the construction sector for subsectors such as housing, roads, and other important social infrastructure such as drainage. We analyse expenditure shocks that may result from inflation and price dynamics, finding that construction sector costs are closely related to exchange rate movements. We identify key bottlenecks to the supply response of the sector and recommend institutional and policy reforms to improve performance and output.

Keywords: construction sector, price dynamics, expenditure shocks, marginal costs, Ghana

JEL classification: E31, F31, O25, Y10

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1 Introduction

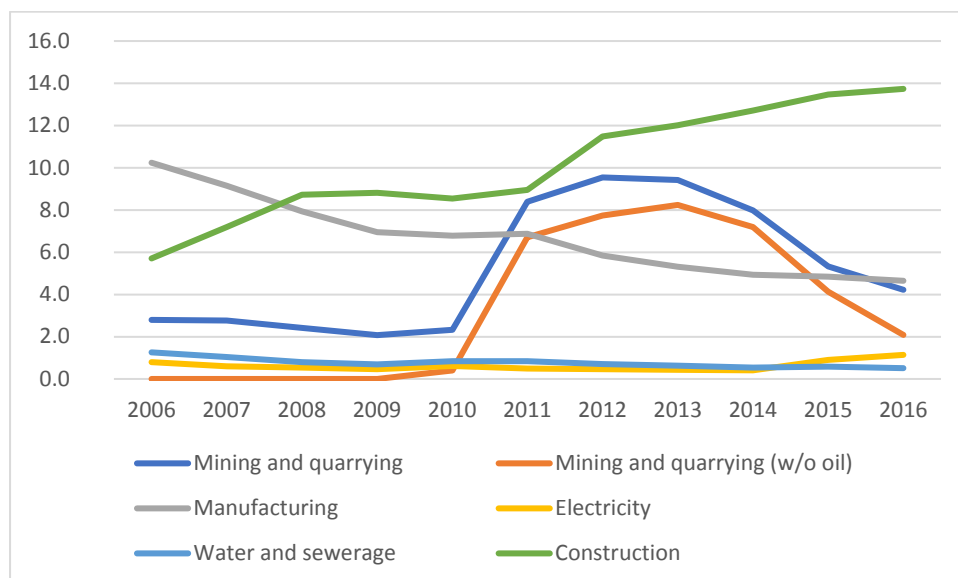
The discovery of oil in Ghana in commercial proportions in 2007 may be reasonably expected to have had significant consequences for the construction sector. Indeed, the production and export of oil have driven large-scale projects in the country's construction sector, such as investments in real estate (in order to provide accommodation for migrant workers and expatriates), the port in Takoradi, and other infrastructure projects around the country. Generally, construction refers to the creation, repair, maintenance, alteration, and demolition of buildings, highways, streets, bridges, roads, sewers, railways, and communication systems. Relevant construction subsectors in Ghana include housing and urban development (i.e. residential buildings; municipal and commercial buildings), infrastructure (i.e. water and sanitation; energy), and transport infrastructure (i.e. roads; airports; ports and harbours).

Government policy is critical to ensuring that there is sufficient investment in the construction sector, and that the sector is able to respond adequately to the oil-fuelled increase in demand for construction and infrastructural developments. Where the construction sector faces significant challenges that limit its ability to increase supply, the rising demand is likely to increase prices within the sector; these higher prices are often indicative of higher marginal costs within the sector. The importance of a country's construction industry stems from its robust linkages with other sectors within the economy (Park 1989; World Bank 1984). The construction industry is known to create significant multiplier effects through extensive backward and forward linkages with other sectors of the economy, although the interdependence tends to change over time. Increases in growth affect the level of construction within an economy; construction activity also generally leads to improvements in welfare since it increases levels of employment and income.

In Ghana, the construction sector appears to be performing well, and indeed contributes substantially to gross domestic product (GDP) and employment within the economy. For example, the demand for cement, a key indicator of construction activity, has increased consistently—from 4.8 million metric tonnes in 2010 to 5.5 million by 2012. According to Sutton and Kpentey (2012), the construction sector's share of GDP increased from 5 per cent in 1975 to 15 per cent by 2007. According to the Ghana Statistical Service, between 2009 and 2013, the construction and real estate industry contributed on average about 14.34 per cent to the country's GDP (GSS 2018). Given its labour-intensive nature, the construction sector is a major employer within the economy. For instance, the recent Ghana Living Standards Survey (GLSS) indicates that 0.2 per cent of young people who had been employed in the previous week worked in the construction sector. Additionally, the Ministry of Education (2010) puts the number of registered contractors at about 23,000.

Figure 1 describes the contribution to GDP of the various industry subsectors over a period of a decade, from 2006 to 2016. In this period, the mining and quarrying subsector contributed little to GDP. This is not surprising, as there was no oil production in the country within this period. After 2010, however, following the discovery of oil, the proportion of the contribution made by the mining and quarrying subsector to the industry sector increased significantly. From 2006 to 2016, the proportion of the manufacturing sector's contribution declined consistently, from 10.2 per cent in 2006 to 4.6 per cent by 2016. It is important to note the trends in the construction sector as well; the proportion contributed to GDP from 2006 to 2016 demonstrates a steady upward trend, and the share of the construction subsector more than doubled from 5.7 per cent in 2006 to 13.7 per cent in 2016. Indeed, after 2010 the construction subsector contributed the largest share of industry GDP, while the share of the mining and quarrying subsector (both including and excluding oil) has been on the decline.

Figure 1: Contribution of construction (and other subsectors) to Ghana's industry sector (% of GDP)

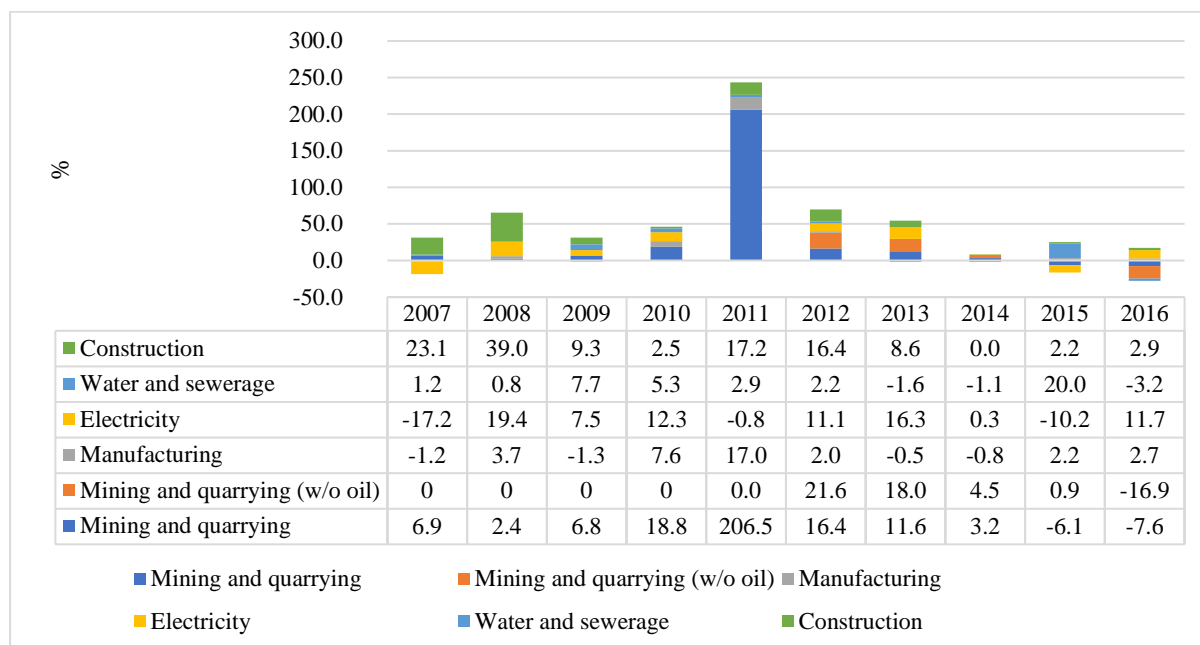


Source: Authors' illustration based on data from GSS (2018).

In order to more closely examine changes in the contribution of the construction and other subsectors, Figure 2 illustrates growth rates between 2007 and 2016. Although Figure 1 shows an upward trend in the proportion contributed to industry over time by the construction subsector, it is observed from Figure 2 that despite a spike in growth rates in construction in the country, since the discovery of oil in 2010 annual growth rates of the subsector have been falling. The growth of the construction sector declined, from 39 per cent in 2008 to 17.2 per cent in 2011 to 2.9 per cent in 2016. The high rates in 2007 and 2008 may be attributed to the massive infrastructure projects (stadiums, real estate, roads, etc.) that were undertaken to celebrate Ghana@50 in 2007 and to host the Africa Cup of Nations tournament and the African Union Heads of State conference in 2008 (Ackah et al. 2014).

Despite the declining contribution of the construction subsector in 2009 and 2010, with growth rates of 9.3 per cent and 2.5 per cent respectively, the increased production of crude oil in 2011 led to significant a growth rate in construction of 17.2 per cent. Not all subsectors demonstrated increased growth within this period, however, as evidenced by the dismal performance of the water and sewage, and electricity subsectors, with recorded growth rates of 2.9 per cent and -0.8 per cent respectively in 2011. Although these subsectors are not the focus of the present paper, it may be important to note the falling annual growth rates of the mining and quarrying sector (including oil) from 2011 to 2016, eventually reaching negative growth rates in 2016.

Figure 2: Growth rates of industry subsectors, 2007–16



Source: Authors' illustration based on data from GSS (2018).

The falling growth rates of the construction subsector provide some incentive to investigate the performance of the sector more closely. The present research study has three main objectives:

- What is the evidence on the marginal costs of construction?
- What, if any, are the key bottlenecks to the supply response of the construction sector?
- What institutional and policy reforms might be useful for improving the performance and output of the construction subsector?

2 Marginal costs of construction

This section examines how costs in the subsector respond to increases in output, with attention to how these marginal costs and expenditure shocks may vary among subsectors within the construction sector such as housing, roads, and social infrastructure such as drains. It also analyses the expenditure shocks that may occur as a result of inflation and price dynamics. Information in this section is compiled from interviews conducted with the Ghana Real Estate Developers Association (GREDA) and Ministry of Works and Housing. The section also includes a discussion on the structure of the construction sector as regards the distribution of firms by size and specialization; it concludes with a brief discussion of expenditure shocks and how these affect construction projects.

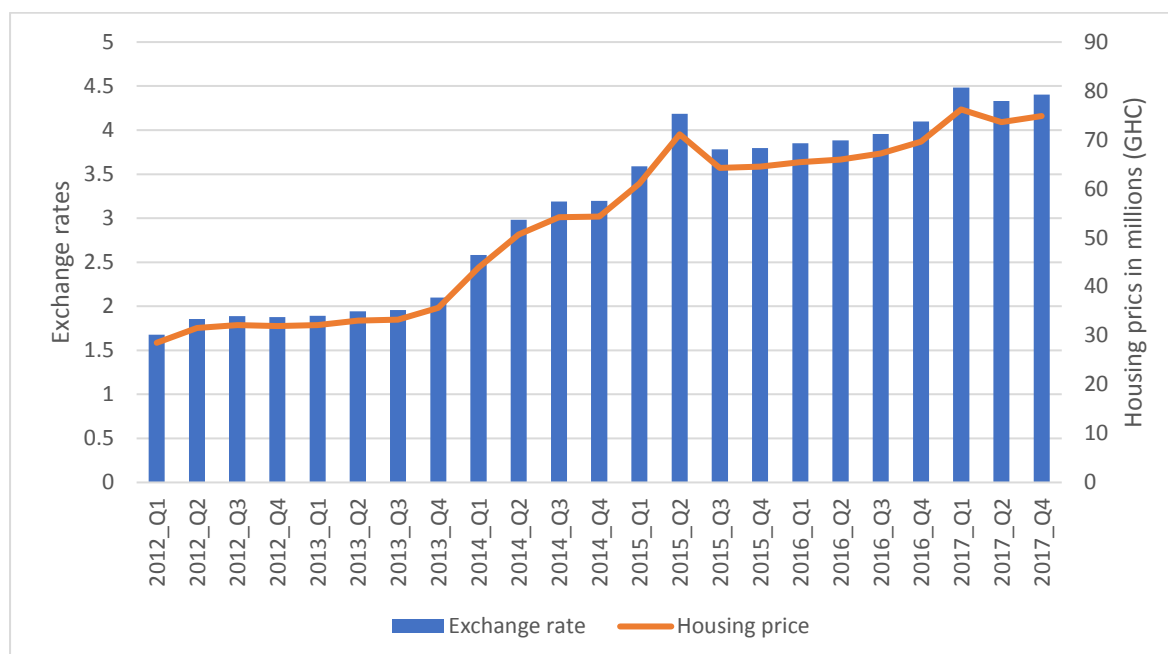
2.1 Analyses of subsector costs

The housing subsector

There is some evidence that the housing subsector in Ghana has experienced increasing costs of operations due to increased demand for housing units. As a result of the country's, and the industry's, heavy dependence on imported raw materials such as high-tensile steels and other equipment, continued and often rapid depreciation of the local currency often leads to higher

costs. Figure 3 illustrates quarterly increases in housing prices between 2012 and 2017, and the strong correlation between this and changes in the US dollar–Ghanaian cedi (GHC) exchange rate.

Figure 3: Trends in exchange rates and housing prices, 2012–17



Source: Authors' illustration based on exchange rate data (Bank of Ghana) and housing data (Trasacco Valley, a major industry player in Ghana's housing subsector).

It is important to note that exchange rate volatilities also affect the costs of skilled and expatriate labour in the industry. Other sources of rising costs in the housing subsector include high import duties at the ports and rising fuel prices which increase firm costs due to increases in transportation and haulage expenses.

It is interesting to note the industry's supply response to this situation of increasing marginal costs of production. There appears to be a preference for a particular section of the housing market, where profit margins are large enough to compensate for increasing costs. According to existing theory, higher costs may often translate into higher prices for housing units in the country, thereby constricting the quantity of units demanded. Despite the noted increases in costs, however, the demand response in the housing subsector appears to be varied. According to interviews with GREDA, there are generally three categories of housing market in Ghana: the high-end, middle-end, and low-end/'affordable housing' markets. The high-end market comprises units which cost US\$200,000 and above and are located in prime areas of the country; the middle-end market comprises housing units that range from \$100,000 to \$150,000; while the low-end/affordable housing market consists of housing units that cost below \$100,000. Interviews with personnel from GREDA indicate that the industry is unable to adequately deal with the affordable housing deficit due to the continuously increasing cost of production, mostly fuelled by challenges such as the land tenure system and lack of affordable credit to finance the industry.¹ Although the provision of social infrastructure such as potable water and electricity is seen as the sole responsibility of government, most parts of the country still lack these basic amenities. Developers are therefore forced to take up the responsibility of providing these social facilities as they develop new areas

¹ The Ghana Housing Policy, launched in 2017) aims to accelerate efforts to address the national affordable housing deficit, estimated to be in excess of 1.7 million housing units.

for habitation. This significantly increases the cost of production, which makes it difficult to satisfy the increasing demand for affordable housing.

Developers have found it more profitable to operate in the middle- to high-end markets in the industry, where there are relatively high profit margins. In these markets, despite high costs of production, production does not appear to be affected in significant ways and the supply of housing units is not constrained.

Roads, drainage, and other social infrastructure subsectors

Production costs in these subsectors have generally been increasing; costs of imported raw materials have experienced large upswings due to rapid depreciation of the local currency. These raw materials include bitumen and other equipment and machinery, which are often sourced from countries in South America (particularly Venezuela) and in Europe. As a result of the rapid depreciation of the cedi, contractors and other service providers tend to index their costs in a foreign currency (usually US dollars) which is expected to be more stable and predictable. For example, in the construction of feeder roads (i.e. roads connecting communities in rural areas) US\$250,000 and \$100,000 are recent quotes for the construction of a kilometre of new bitumen road and the rehabilitation of existing road, respectively.

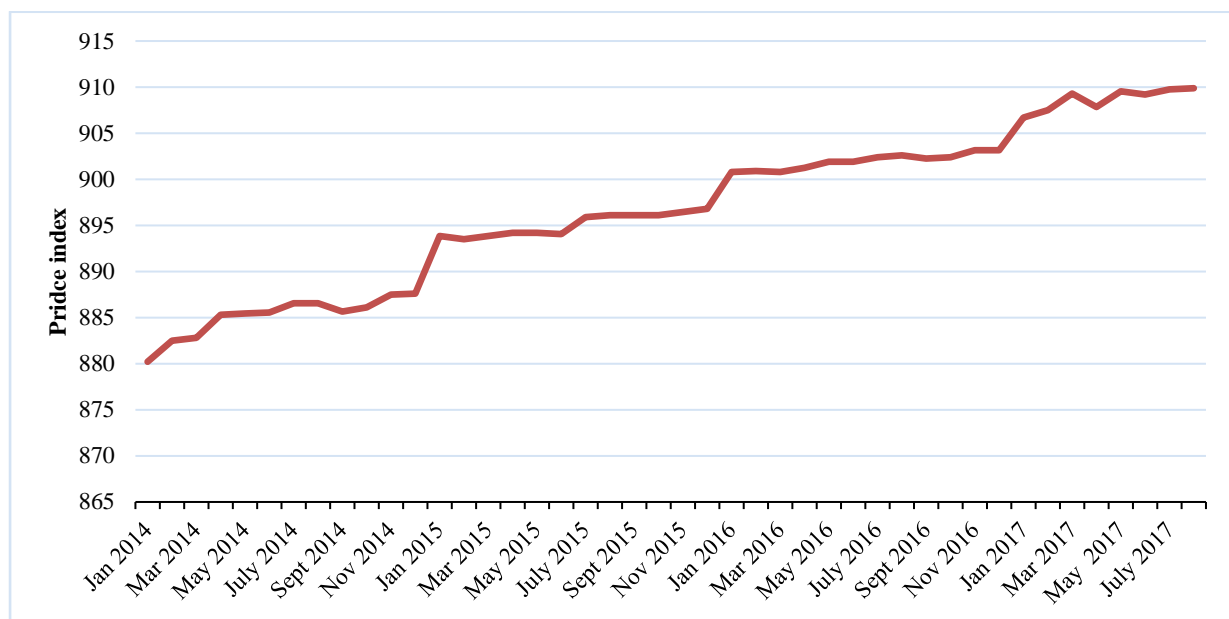
From interviews with the Ministry of Roads and Transport (responsible for roads and infrastructural construction in the country), the greatest proportion of costs in the roads and social infrastructure subsectors are associated with imported raw materials, including the use of skilled expatriate labour. Figures 4 and 5 graphically illustrate these increasing equipment and labour costs between 2014 and 2017.

Figures 4–6 show various indices used to track changes in the prices of construction inputs such as labour, machines, and equipment, as well as chippings for concrete works. The indices are constructed from the Works Procurement Manual (WPM).² Figure 4 displays the cost index for plant and equipment—such as earth-moving equipment (hydraulic excavator, dozer), road-making equipment (road paver, asphalt concrete plant), and hauling equipment (truck, tractor trailer)—employed in infrastructural projects. The index measures changes in the costs of providing and maintaining construction plant and equipment for a specified period of time. Between 2014 and 2017, the index suggests a steady increase in equipment costs in the roads and social infrastructure subsectors.

Figure 5 shows the price index for local labour, based on annualized data from 2014 to 2017. Based on the data, the cumulative annual growth rate in labour cost between 2014 and 2017 is approximately 26 per cent.

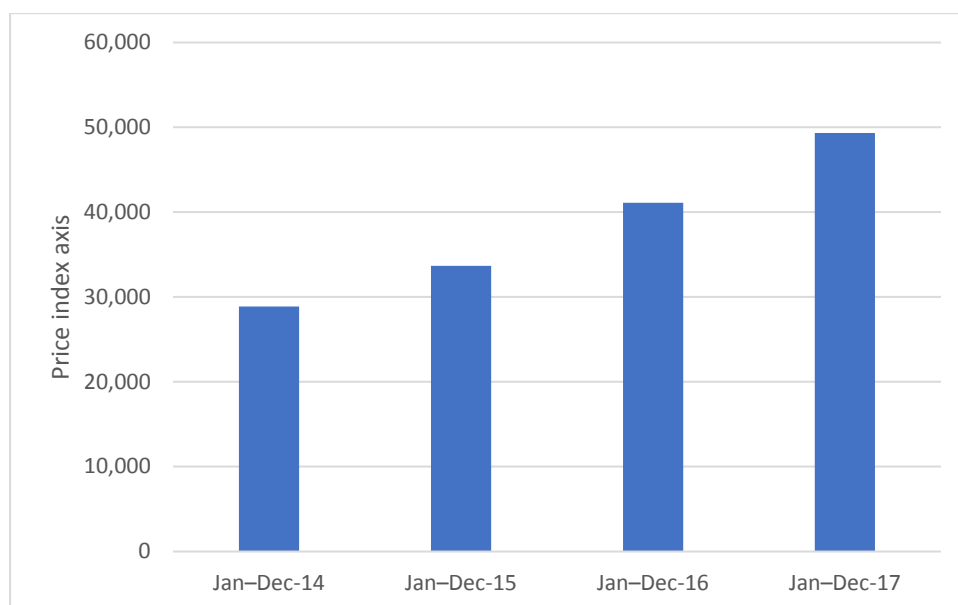
² The World Bank produces price adjustment formulae for civil engineering contracts. The Ministry of Roads and Transport modifies these formulae based on the local materials and inputs that are used in the construction industry to produce its localized version of the index. Annexes D–F of the Works Procurement Manual-3.2, Section 6, provide details of each index and how it is calculated. For details on the construction of the indices, see Working Group on Indices for Civil Engineering Contracts (1979).

Figure 4: Trends in price index for plant and equipment, 2014–17



Source: Authors' illustration based on Ministry of Roads and Transport (Department of Urban Roads) data.

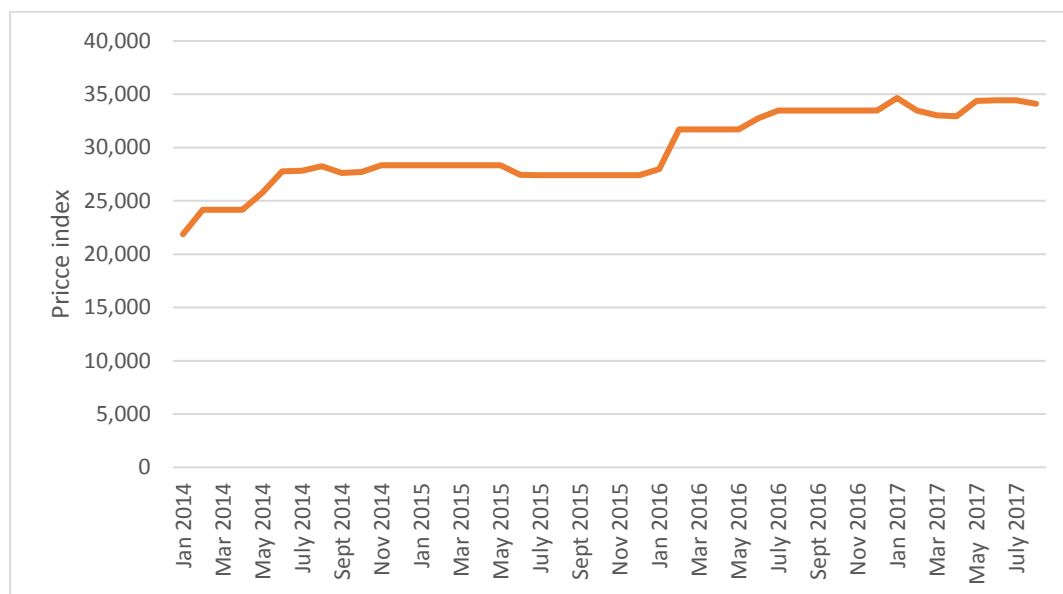
Figure 5: Trends in annualized price index for local labour, roads, and social infrastructure, Ghana, 2014–17



Source: Authors' illustration based on Ministry of Roads and Transport (Department of Urban Roads) data.

Chippings are a key ingredient in the construction of drains, tunnels, bridges, and other related infrastructure. The cost of high-grade chippings has also been on the rise, as evidenced by the trend observed in Figure 6. Often, irregularities in the supply of high-quality chippings necessitates the addition of quarry dust, which also drives up costs in the industry. From Figure 6, the price index increased sharply in the first half of 2014, and remained stable throughout 2015. However, the price index for these high-grade chippings resumed its upward trend from the second half of 2016 to the first half of 2017.

Figure 6: Trends in price index for chippings, 2014–17

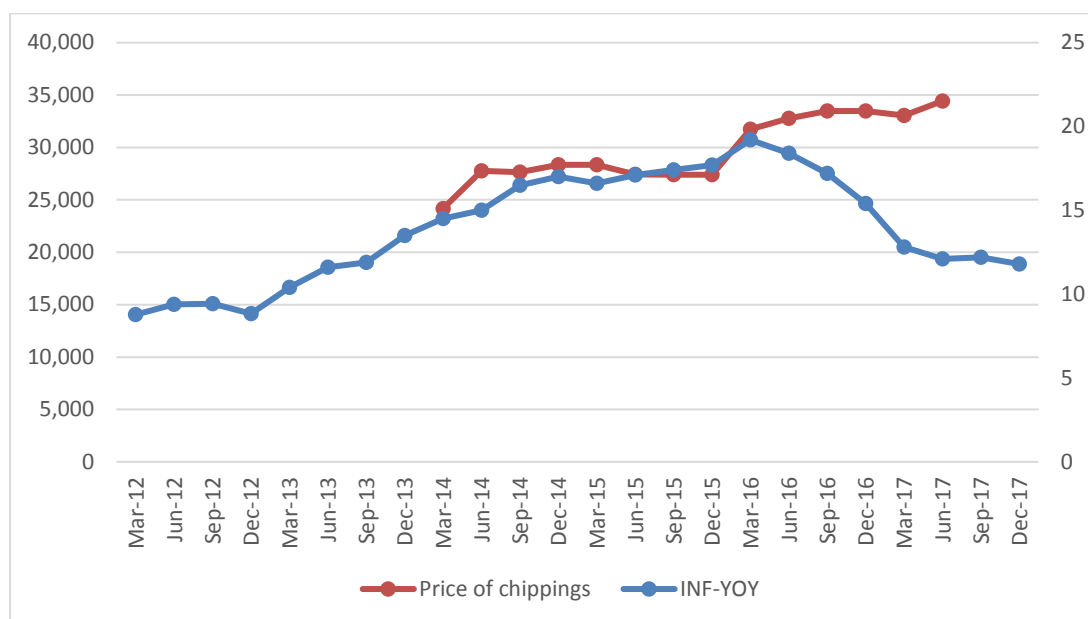


Source: Authors' illustration based on Ministry of Roads and Transport (Department of Urban Roads) data.

2.2 Patterns of inflation and subsector costs

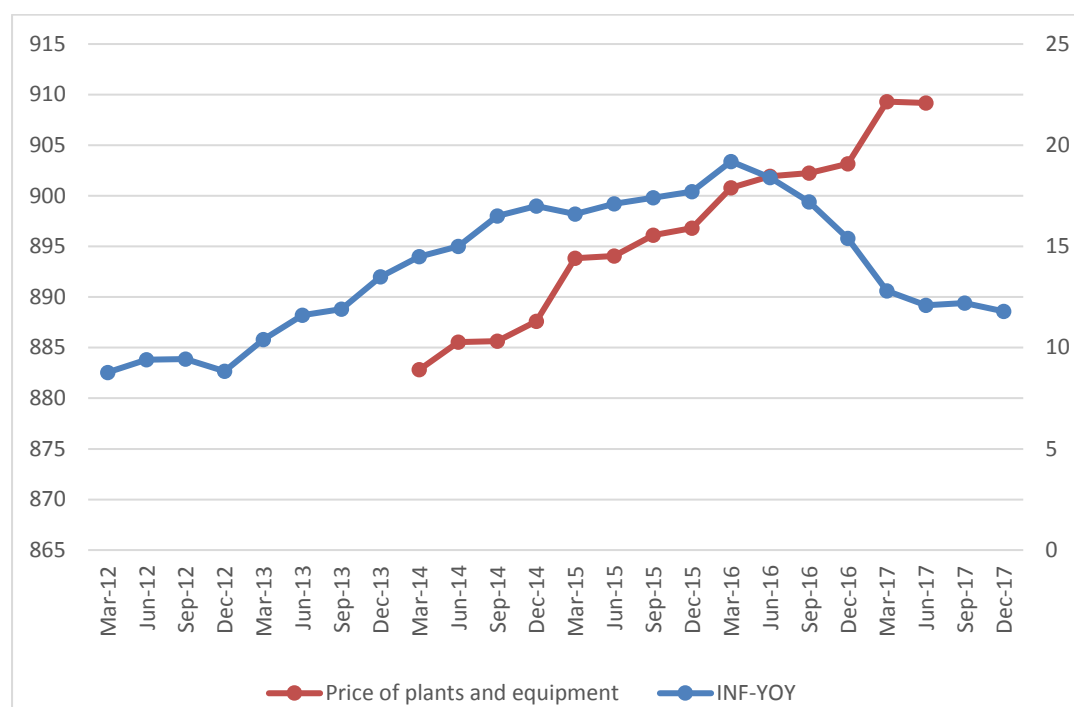
Figures 7a–7d compare the costs of housing and a series of construction costs with trends in year-on-year (YOY) inflation (INF) between 2012 and 2017, the period for which costs of construction components are available. Generally, inflation appears to have risen steadily between 2012 and 2015, but it fell in early 2016. The fall in inflation rates in 2016 may be attributed to some degree of stability in major drivers of inflation in that year, such as utility and transport prices. Prices of housing and construction in the various subsectors initially appear to follow trends in inflation closely, but diverge around 2016.

Figure 7a: Inflation (YOY) and price of chippings, 2014–17



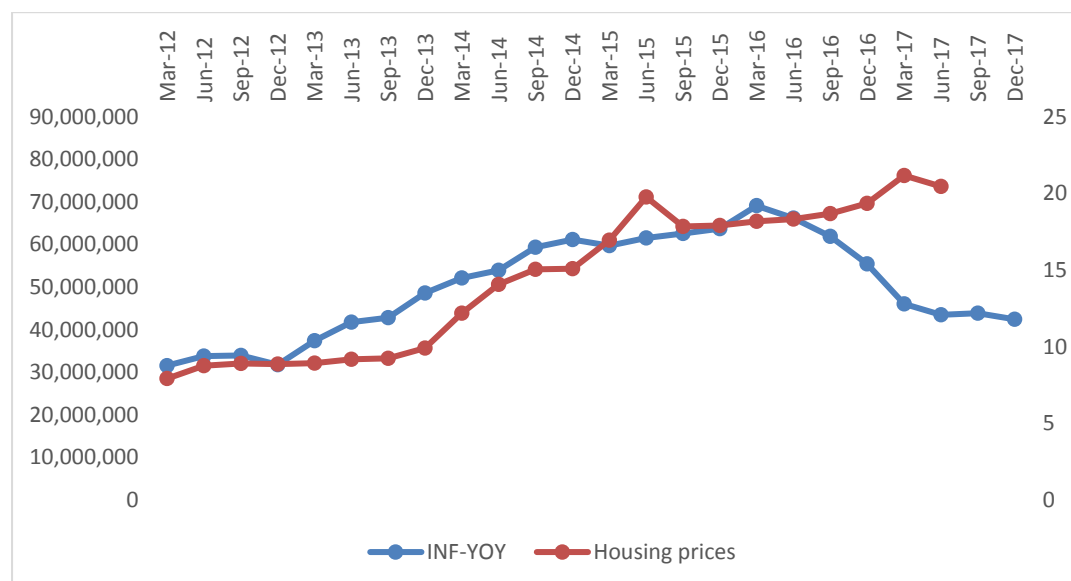
Source: Authors' illustration based on Ministry of Roads and Transport (Department of Urban Roads) data.

Figure 7b: Inflation (YOY) and price of plants and equipment, 2014–17



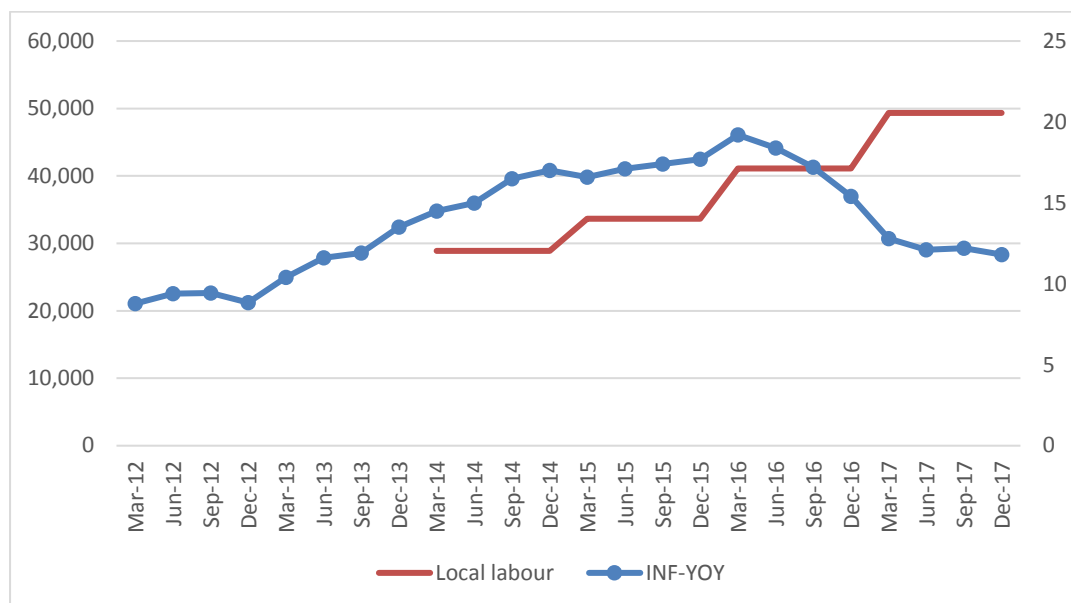
Source: Authors' illustration based on Ministry of Roads and Transport (Department of Urban Roads) data.

Figure 7c: Inflation (YOY) and housing prices, 2012–17



Source: Authors' illustration based on Ministry of Roads and Transport (Department of Urban Roads) data.

Figure 7d: Inflation (YOY) and price of local labour, 2014–17



Source: Authors' illustration based on Ministry of Roads and Transport (Department of Urban Roads) data.

Rising construction costs may be explained by exchange rate movements, as mentioned above. The increasing trend in the US dollar–Ghanaian cedi exchange rate and the subsequent higher cost of imported inputs may provide a plausible explanation for the increases in housing and construction prices over time, despite the decline in general price levels in 2016. Although local prices fell after 2016, contractors in the sector often peg prices to the dollar rate.

2.3 Structure of the construction industry

The construction industry in Ghana comprises building project consultants, engineers, architects, quantity surveyors, building contractors, and artisans. There is currently no national authority that governs and regulates the activities of the industry. In the absence of this authority, the various sectors within the industry have individual governing institutions. The Ministry of Works and Housing supervises all building and civil works in the country while the Ministry of Roads and Highways oversees the activities of players in the construction and maintenance of roads, highways, railways, airports, and other structures. These two ministries are therefore jointly responsible for the registration and classification of contractors within the industry. Nonetheless, there is no national database of industry players with information on the respective sizes and capabilities of the members.

Classification of contractors in both the housing and roads and civil works subsectors is primarily based on the financial resources, human resource capacities, and level of technology (i.e. type and efficiency of equipment employed) of firms. There are different classifications for contractors in the housing and roads subsectors. These are described below.

Contractors in the housing subsector are grouped into four classifications, 1 to 4, depending on the value of the project to be implemented. As described in Table 1, class 1 contractors (D1K1) are contractors with the capacity to execute projects that are above US\$500,000 in value; class 2 contractors (D2K2) have the capacity to execute projects that are up to a value of \$500,000; class 3 (D3K3) contractors have the resources to implement projects with a maximum value of \$200,000; while class 4 (D4K4) contractors have the means to carry out projects with a maximum value of \$75,000.

Table 1: Housing subsector classification

Class	Project value	Proportion of contractors
Class 1 (D1K1)	> \$500,000	10%
Class 2 (D2K2)	≤ \$500,000	20%
Class 3 (D3K3)	≤ \$200,000	60%
Class 4 (D4K4)	≤ \$75,000	10%

Source: Author's construction based on information provided by the Ministry of Works and Housing, 2018.

According to the Ministry of Works and Housing, the majority (roughly 60 per cent) of contractors in Ghana fall within the class 3 category, while only about 10 and 20 per cent fall within the first two categories, respectively. The remainder fall within the fourth classification.

These classifications have direct implications for the types of projects that contractors within the sector can bid for, with varying degrees of competition from one classification to the other. Given the relatively lower concentration of contractors in class 1, the level of competition in this class appears to be more oligopolistic in nature. The level of competition in the class 3 category, however, where more contractors are concentrated, appears to be more competitive.

In spite of the preferential bidding that is typically reserved for lower-class Ghanaian contractors (intended to build their capacity in the industry), there is a recent trend of incursion by Chinese firms. According to the Association of Building Contractors and Civil Engineers, contractors involved in relatively low-value contracts such as the construction of classroom units within villages and other minor civil works within rural areas, which were initially reserved for class 4 contractors, are now having to deal with fierce competition from Chinese construction firms. These foreign firms are often fronted by local citizens, who enable them to win contracts intended for indigenous contractors. Once such contracts are won, Chinese construction firms typically rely on foreign labour (mainly Chinese) in order to execute the projects.

Contractors in the roads subsector are also classified into four categories, based on the financial assets of the firm. These are summarized in Table 2.

Table 2: Roads subsector classification

Classification based on financial capabilities	
Class	Project value
Class 1	No limit on tender
Class 2	≤ \$2.5m
Class 3	≤ \$1.3m
Class 4	≤ \$0.5m
Classification based on nature of project	
Class A	Major roads and highways
Class B	Bridges and culverts
Class C	Labour-intensive works and steel bridges
Class D	Rehabilitation and maintenance works

Source: Authors' construction based on information provided privately by the Ministry of Roads and Highways, 2018.

Class 1 contractors are those that have no limit on their tender—they can implement projects of any value. Class 2 contractors are those with the resources to tender bids up to a maximum of US\$2.5m, class 3 contractors can tender bids up to a maximum of \$1.3m, while class 4 contractors have a maximum of \$500,000. In addition to a classification based on financial capabilities, contractors are also classified according to the nature of project. A category A contractor can execute large projects such as major roads and highways, airports, and related structures; a category

B contractor is able to execute projects such as bridges, culverts, and other structures. Contractors in categories C and D are able to implement projects relating to labour-intensive works and steel bridges, and rehabilitation and maintenance works, respectively.

Ghana's Road Fund was established in 1985 by an act of parliament to preserve the country's road network. Funds are obtained from multiple sources, including fuel levies; tolls from roads, bridges, and ferries; fees from vehicle licensing and inspection; and international transit fees collected from foreign vehicles entering the country. The Ghana Road Fund Secretariat is the governmental agency, under the Ministry of Roads and Highways, that is mandated to manage the Road Fund. Unlike the road and highways subsector, the housing subsector currently does not have any fund that allows for the maintenance and management of the country's housing structures.

2.4 Expenditure shocks and price dynamics

A major source of production interruptions in the construction sector is changes in local prices, mainly due to the instability of the exchange rate. As illustrated in Figure 3, these fluctuations have had direct bearings on the costs of production. Particularly in the area of road construction and other social infrastructure, the government is expected to bear the additional costs that arise, as this is often embedded in contract clauses. These unexpected price changes often culminate in delays or indefinite suspensions of construction projects.

A second source of expenditure shocks is the compensation that often needs to be made to individuals affected or displaced by construction projects. It is not uncommon for this compensation to run into millions of Ghanaian cedis. Prohibitive costs such as these often lead to projects being delayed for long periods. Projects such as the construction of highways and other urban construction activities are more often plagued by compensation challenges, compared with more rural projects. This is due to the fact that it is relatively easier to compensate people with farmlands in smaller towns and villages than those with businesses and houses in urban locations. A good example of this is the 52-kilometre Ayanfuri–Asawinso highway in the Central Region, which was funded by a development partner. Although originally scheduled to be completed within 24 months, the project was delayed for about two years due to issues of compensation. The delay stemmed from the government's inability to pay compensation to project-affected people in the construction path.

A third source of expenditure shocks is the presence of natural obstacles in the landscape. These obstacles may include large boulders and bodies of water in the path of a construction project, which may result in unanticipated interruptions in the implementation of a project while the most appropriate resolution to the problem is determined and carried out. Often, large boulders are required to be dug out and crushed before construction can resume. Additionally, depending on whether construction activities begin in the rainy season or the dry season, the water table may be higher than expected, causing interruptions in construction activities. In such situations, additional materials may be required to reinforce the ground before actual construction can begin, increasing time and financial costs.

The existing land administration system also poses a shock to expenditure in the construction sector. The activities of land developers are often halted for long periods due to prolonged land litigation issues. Such interruptions have direct cost implications for developers, especially in an environment where the prices of raw materials, indexed to the US dollar, experience price volatilities. Fluctuations in power supply have also been a major source of production interruptions in the construction industry, especially in the past couple of years, during which the country's power challenges have heightened. Interruptions caused by unreliable power supply often result

in higher expenditure due to reliance on alternative, but often more expensive, power sources such as generators.

Finally, expenditure shocks may occur as a result of changes in government policy and the lack of continuity in projects. Projects begun by an outgoing government are not necessarily completed by the new administration. In rare cases where projects are indeed taken up by a new administration, funding can be delayed for long periods, leading to major interruptions to the original schedule. An example is the Borteyman Housing Project, which was commenced by the previous administration in 2006 but received little attention and financial assistance when the new government assumed office in 2008. The government only provided support to revive this project in 2014, when challenges to affordable housing units had become topical. Interruptions in construction project schedules also occur during public–private partnership (PPP) arrangements, when delays in the realization of government pledges, in the form of tax refunds of about 5–10 per cent, occur.

3 Bottlenecks to the supply response of the construction sector

The presence of challenges to and limitations on demand-induced supply in the construction sector is likely (as mentioned earlier) to result in higher prices. In this section, particular attention is paid to institutional constraints such as access to land and permits; critical inputs such as skilled labour and raw materials; and organization and capability issues such as the structure of the sector and competition. These are discussed below.

3.1 Access to land and permits

A supply bottleneck in the construction sector is the difficulty of accessing land for productive activity. Despite the physical presence of land resources, the existing tenure systems restrict the availability of and access to these resources. Approximately 80 per cent of Ghana's land is communal land that is vested in chieftaincies, with communities holding land through allodial titles (USAID 2016). Land is therefore sold less frequently, and decisions about the use of the land are made by families and communities. The lack of documentation involved in these situations provides little evidential foundation for use rights. The situation is further complicated by the existence of parallel formal and legal systems of managing land, which are more common in southern Ghana, where traditional processes are less dominant. The result is therefore little tenure security, even if access is granted for land use—and the lengthy and bureaucratic procedures involved in registering plots of land often discourage this practice. The end result is often multiple land transactions for the same piece of land. Land developers are often saddled with multiple payments to multiple individuals in order to have legitimate access to the land, leading to increases in costs. The Ghana Housing Policy, launched in 2017, aims to provide solutions to these problems. In addition to the establishment of a land bank register to provide prospective investors with adequate information on land ownership status, location, availability, and other such data as will aid decisions on housing investment, another objective of this policy is to:

Facilitate private sector access to land banks through a programme of land ownership confirmation and guarantee arrangements with MMDAs [Metropolitan, Municipal and District Authorities] and regional land bank registry. This would be done in collaboration with land owners in all regional and district capitals to reduce the associated risk and transaction costs. (Government of Ghana 2015: 15)

Low access to land resources has noted direct implications for construction activity. Indirect effects are also present, as access to land and its proper documentation is often a major requirement for securing credit from financial institutions.

3.2 Access to critical inputs

Skilled labour

A major supply-side bottleneck of the construction subsector in Ghana is the nature of and capacity for skills development. Despite the large number of artisans and construction workers in the country, these individuals largely operate in the informal economy, with little skill and training to match the expertise required for modern construction projects. According to the GLSS 6, over 90 per cent of youth in the construction sector are found in the informal economy (GSS 2014). An unfortunate consequence of this is that local artisans are often unable to bid for and win contracts in the construction sector.

In addition to training programmes organized by the national Council for Technical and Vocational Education and Training (COTVET), which provides technical training for artisans, the Ministry of Roads and Highways also organizes frequent competency-based skills training programmes for all levels of management and project implementation personnel and its stakeholders through its inter-ministerial training centre at Koforidua in the Eastern Region. The training centre provides training to both new and existing members in new skills and technologies in the construction industry. It also provides hands-on skills development training to personnel from other West African countries such as Togo and Burkina Faso.

Despite existing attempts at skills training, the skills gap remains relatively large, as has been noted by a number of researchers. Darvas and Palmer (2014), for example, found a shortfall of 60,000 skilled artisans in the construction sector, with the dearth projected to increase to as many as 250,000 by 2020. A large proportion of the Ghanaian construction industry's growth originates from its residential market, followed by commercial and retail shopping, heavy engineering (especially road works), and multi-storey and high-rise buildings. This translates into high demand for skills such as bricklaying, plastering, plumbing, roofing, steel-frame flooring, steep roofing, and architectural assistants at all levels. This demand is, however, not being met by a sufficient quantity, or quality, of labour with more sophisticated, frontier skills.

The existing freeze on employment as a condition of an International Monetary Fund (IMF) facility received by the country also has implications for the recruitment of various types of skilled labour, such as engineers and surveyors among others, necessary for providing supervision on a number of projects.

A result of the lower training and skills level of Ghanaian artisans is that they appear to face significant levels of competition from neighbouring Francophone countries in certain aspects of construction. Togolese artisans, for example, are noted for their superior 'finishing' skills, and are also often willing to work for lower wages than their Ghanaian counterparts. The limited skills development may be explained by factors such as the limited capacity of existing technical training institutions, a shortage of teaching and training staff, and misalignment between existing curricula and the current needs of the construction sector. The high mobility levels of artisans in the construction sector often serve to deter companies from training their staff, as they could easily be poached by other organizations and individuals (Fugar et al. 2013).

Raw materials

Another supply-side bottleneck is the rising cost, in Ghana, of raw materials for construction purposes, such as water, cement, and electricity, which contributes to increasing costs of production. The government of Ghana, in response to the situation, recently introduced waivers and tax concessions for contractors participating in particular infrastructural projects. A good example is the US\$1.5bn expansion of the Port of Tema, which is being carried out by the Ghana Ports and Harbours Authority, Netherlands-based APM Terminals, and French firm Bolloré Africa Logistics. Contractors received tax concessions valued at \$832m, which include waivers on materials and equipment taxes, as well as a ten-year corporate tax exemption. It is important to note, however, that not all project contractors are beneficiaries of these fiscal incentives.

There is also an issue of adequate access to the necessary raw materials within the country. There are noted time delays in efforts to locate quality raw materials, and when these materials are found, there are transportation costs in moving them from source to construction destination. For instance, road construction projects in the northern part of the country often source quarry dust and chippings from the Brong-Ahafo region. The distance between these regions results in delays to construction, in addition to haulage costs, given rising fuel costs in the country.

There also appears to be a preference for foreign-supplied building and construction materials due to their perceived higher quality, despite the fact that similar materials are often produced domestically. Unfavourable changes in foreign exchange rates and the depreciation of the cedi, however, have had negative effects on imports of these raw materials, constraining their supply and access. Additionally, spikes in the prices of raw materials such as copper and aluminium on the world market can also be disastrous for the construction sector. A reason often cited for the preference for foreign construction inputs is that locally produced raw materials are not of the level of sophistication that is required for more complex construction projects.

3.3 Organization and capacity

Noted delays in the payment of funds for government construction projects often limit the participation, and hence the development, of local firms. There are often financial obligations to contractors which lead to delays in completion or complete abandonment of infrastructural projects. Additionally, tax refunds (mainly promised to the private sector in PPPs) are usually not fulfilled. For example, delayed tax refunds from the government have been the main reason for the delays in the completion of the Segleme Housing Project in Prampram in the Greater Accra Region. As a result of these funding issues, larger, foreign firms are often the beneficiaries of large-scale construction projects as they are more likely to have the necessary capital to remain in business in the event of delayed government payments. This situation predictably excludes many local contractors. Although it might be expected that local artisans would benefit through being employed by these large companies, this is not often the case. Many large-scale construction projects provide few opportunities for the training of artisans, unlike smaller domestic construction projects. Large foreign contractors which employ domestic firms may relegate them to shorter-term and more menial activities, as is common across Ghana's transport infrastructure subsector, such as in the construction of ports, oil refineries, and airports.

A second supply bottleneck in the construction sector may be the changing priorities of government, often linked with changes in political power. The provision of infrastructure often has a bearing on the budgetary allocation for the sector and therefore, depending on the priorities of the existing government, parts of the construction sector may receive little or no attention. An example is the prioritization of infrastructural growth during the 2012–16 Mahama government,

while the current government appears more focused on a free-education agenda. This might explain the declines in budgetary allocation for roads and other infrastructure in recent periods.

Access to the prospect of large-scale projects tends to require political connections. This is due to the fact that government is the main supplier of construction projects in the country, a situation which may increase levels of bureaucracy, corruption, and other inefficiencies in the subsector. A number of reasons may be given for the flourishing of corruption in the construction sector. First, due to the large amount of funds that are often labelled for construction projects, it may be less detectable if additional funds are included for bribery purposes and kick-backs. Second, the true amount of funds channelled directly into a project may not be apparent until long after the project is completed and payments are made. Finally, the lack of regulation within the subsector may exacerbate corruption. Due to the lack of an established regulating body within the subsector, the government serves as both the client and the regulator. It is not uncommon to find situations where government officials are themselves the owners of construction firms that are the final awardees of construction projects. The structure of the construction sector with respect to the awarding of contracts therefore serves as a deterrent to local artisans, as the processes involved in bidding and the awarding of contracts often lack transparency.

Corruption in construction projects may be present at any and all stages (i.e. planning, inspection, design, bid/contract signing, construction, service delivery, maintenance/management, subscription, billing, disconnection, fault redress, etc.) and can lead to lower efficiency and effectiveness of infrastructural services, as these final infrastructures may be unnecessary, unsuitable, defective, or dangerous.

4 Institutional and policy reforms in the construction sector

This section discusses some institutional and regulatory reforms necessary to eliminate the noted bottlenecks in the supply of construction within the country. These suggested policy reforms stem directly from the noted constraints in the construction sector.

An observation on Ghana's construction sector is the noted absence of a single government agency responsible for overseeing activities within the sector. Currently, the responsibility appears to be shared by three ministries—the Ministry of Water Resources, Housing, and Public Works; the Ministry of Transport; and the Ministry of Road and Highways. There also appear to be minimal legal mandate and enforcement mechanisms operating in the subsector. There has been some interest in the establishment of a regulatory body—the Construction Industry Development Authority, which is currently under review by the Ministry of Works and Housing and Ministry of Roads and Highways—to ensure safety, transparency, and professionalism within the industry, but this has not seen much progress. A major responsibility of this central agency would be to monitor and ensure transparency in the awarding of contracts, for example. It is believed that the lack of a regulator in the industry has led to the lack of enforcement of some laws, such as the preferential bidding for particular projects which in turn has led to the incursion of foreign players in a section supposedly reserved only for Ghanaian contractors.

The following are other avenues that could be explored to promote transparency in the bidding for, awarding of, and execution of construction projects: establishment of a national database of all stakeholders within the sector; random auditing of public funds to increase transparency and monitor public expenditure; legislation to reduce the incidence of bribery and kick-backs; blacklisting of companies found engaging in acts of bribery; public disclosure of all project

agreements; integrity pacts undertaken during both tender and project execution phases; prohibitive action taken on corrupt practices among trade or professional associations.

There is also a need to develop a comprehensive local content policy for the construction sector, similar to what exists in the mining subsector. This might involve reserving a proportion of and/or particular kinds of projects for local firms. There are several potential benefits to be derived from this. A local content law that makes collaboration essential between foreign and local firms could lead to critical skills transfer from the former to the latter, leading to increased capacity. This would also increase employment opportunities and incomes for local artisans. However, it should be noted that, as occurs under the existing local content law in the mining sector, the low skills levels of local artisans may present a challenge to successful collaborations between local and foreign firms.

Other policy reforms could be explored to raise the skills levels of local artisans in the construction sector. For instance, additional training could be provided for local artisans. Despite the fact that most artisans are trained under apprenticeship schemes, no additional professional training is received after apprenticeships, limiting access to knowledge of new techniques and equipment. The Youth Inclusive Entrepreneurial Development Initiative for Employment (YIEDIE) programme is an example of such an intervention. This is a five-year programme designed to create economic opportunities in Ghana's construction sector for disadvantaged youth (i.e. school drop-outs living in poverty). Established in 2017, the programme aims to provide training and better job placement for 23,700 young people, leading to an estimated 90 per cent increase in income levels. Over 14,000 youth will be given training in technical construction skills through participating in an apprenticeship programme, enhanced with entrepreneurship, life skills, and safety and health training. The remaining youth will receive entrepreneurship training relevant for participation in the construction sector, along with support in microenterprise start-up or growth. Financial literacy education is also provided to all youth. Despite the laudable components and aims of the programme, the focus on only disadvantaged youth may present a limitation, as other young and older people could also benefit from such training. Additionally, the programme presently targets only a few of the largest cities in the country (i.e. Accra, Kumasi, Sekondi-Takoradi, Ashaiman, and Tema), preventing it from reaching larger numbers of artisans who require training.

The issue of the late payment of contractors within the subsector is another subject for potential policy reform, as it has disastrous consequences particularly for small-scale local contractors. Due to delays in payment by government, local construction companies often pay high interest rates on loans contracted. Additionally, in several instances, local firms default on these loans, leading to a perception among banks that loans for government projects are risky. This reduces the competitiveness of local firms, compared with that of their foreign counterparts, as they are unable to raise the required capital to bid for and execute projects. Even when these funds are secured, they are often at high rates of interest. There have been calls, therefore, for the passage of a Delayed Payment Law (DPL), not unlike what exists in countries such as the UK, Singapore, and Malaysia. Such a law would make it mandatory for government to make interest payments on all delayed construction payments, which would serve to compensate for delays and guarantee the survival of local firms, and would also perhaps act to deter late payment by the government in the first place.

To tackle the problems of irregular supply of construction materials, a reliable value chain could be put in place. For example, to make quarry products more accessible there is a need to encourage investment in the manufacture of chippings and quarry dust, which are both essential in the construction industry. Currently, the few quarries in Ghana are mainly located in the southern half of the country. Therefore, all construction in the northern belt is particularly constrained with respect to accessing cheap quarry raw materials. Investment in this area would be beneficial,

particularly for construction projects in northern parts of the country. Despite the noted importance of free trade, imports of some building materials could also be restricted so as to encourage production by local individuals. For instance, Angola has banned the import of cement into the country in order to protect its local industries.

Effective collaboration between government and the other stakeholders (housing developers) in the area of providing social infrastructure should be encouraged. A construction fund should also be established as a means of easing the cost of operations. Such a partnership would enable the industry to deal more effectively with the rising demand for affordable housing. The establishment of a housing development fund would also be useful for developers, allowing them to access affordable long-term credit in order to reduce their operation costs and hence increase their ability to effectively deal with the affordable housing gap.

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