Management of construction prices in Vietnam under market orientation In the period of international integration

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Abstract. Different from countries with long-standing market economies, Vietnam and the Russian Federation are both transitioning from a centrally-planned economy to a market economy, so the determination of the state role in construction price management is particularly important. In Vietnam, the system of construction cost norms, issued by Vietnamese government applied throughout the country, is obsolete and does not keep pace with the development of construction technologies, leaving a huge gap in practice.

In developed countries, the collection and establishment of construction price data are based on detailed unit prices finished construction contracts, official published national statistics, and annual reports from professional associations and businesses.

This paper surveys literature review on the topic of construction price management and analyses current situation and construction price formation in Vietnam which contributes to innovating the way of forming and managing construction prices in the direction of market and international integration.

1. Introduction

The correct and full calculation of the total investment and work construction cost estimates is essential for state management, project management of investors and construction contractors using state capital and other sources. However, according to many researchers, the system of construction norms in Vietnam is too outdated, not suitable for increasingly developed technology and equipment.

Analysis of scientific works on construction price management in countries around the world has brought about important results. In countries with a long-standing market economy, the state does not organize the setting and announcement of construction estimate norms and mandatory regulations.

Regarding the approach of the process of forming construction prices, in the countries transitioning from a centrally-planned economy to a market economy, there are currently two points of view: the first one is the policy of strengthening the control role of state, the second, by contrast, only forms market mechanisms to regulate prices.

The research results provide a basis for clearly defining the state role in construction price management in Vietnam, proposing solutions to innovate the method of managing construction prices according to market orientation and catching up scientific and technological advances.
2. Literature review

2.1. Overview of scientific researches on price formation systems in countries with long-standing market economies such as the US and France

Semenova Yu.A. and Petreneva O.V. [2] conclude in a market economy the state does not directly intervene in the production and business process and finance of construction market participants or the price formation process of building products, but it indirectly manages to impose price formation rules through the regulatory system.

In industrialized countries with market economies, the database for constructing cost estimation systems is based on market price and estimated price registration. Therefore, the norms set published by professional social organizations are very suitable for estimating construction investment, it does not represent the base price, but the actual average price expected in the next year. The contractor's estimate is based on the results of the cost analysis of contractor activities and the cost of resources used. The source of data on detailed unit prices is the unit prices under the contracts made previously, the officially published national statistics, as well as the set of norms published by enterprises every year.

Original data of detailed construction unit prices are detailed construction unit prices under previously signed contracts, official national statistics, as well as annual published unit prices of businesses (Mint, Richardson, Dodge, Marshall & Swift companies in the United States, Spons in the UK,...) [3].

Akintola Akintoye & Eamon Fitzgerald [1], in the United Kingdom, there are three main methods used for estimating: detailed estimation, estimation based on comparison with similar projects and calculation according to cost per unit. The main method used by companies is detailed cost estimation including construction costs (materials, labor, construction machines), general expenses, pre-calculated taxable income. In addition, in the UK, quantitative analysis techniques are perceived to be more accurate but rather complex so are not commonly used. Methods of estimation based on information about historical and similar construction costs are reflected as highly fluctuation and unreliable.

E.V.Shaidurova and O.V.Petreneva [4] state in developed industrial countries with market economies, the nature of determining construction cost estimates is to determine market prices and forecasts... The basis for determining this construction cost is the national statistical data system, completed contracts, and annual construction cost estimates,... In addition, it is imperative to exercise control over construction price.

In the US, since 1942, multinational corporation R.S.Means Co. Incorporated Ltd has announced a system for determining the cost of construction, which is the basis of an annual construction estimate, including the average construction cost of the whole United States (including general construction price). The regulation of relations in the field of US construction economics since 1905 is the set of construction codes and standards Building Codes and Standards. The planning of construction expenses is based on the principle of division of work construction expenses based on the designing step and construction expenses according to the project implementation stage. This principle allows investors to allocate resources appropriately, formulate financial plans and prevent unforeseen expenses. At the same time, each stage can compare different construction tasks with each other.

Matveev Mikhail Yuryevich [5] considered that many constructions have used the construction estimate data set issued by reputable private organizations in the US and France to manage the construction cost effectively. These cost estimation sets are used for reference to cost estimating subjects and are not compulsory. US cost estimates, especially France, most of the management and price formation according to the market price of the work, construction components. These components and tasks have been specified in detail in mass measurement standards and general format.

Studies [4,5] show that the two estimation sets of the United States and France have certain differences.

- US estimation published the 68th edition, while French estimation is the second time. The update and replacement cycle is also different;
- In the US estimates, the cost estimates divide costs directly by economic categories. In the French cost estimates, the estimated prices are general construction prices, including indication of each component work price;
- In the French cost estimates, the combined construction price includes two components: material costs (materials and construction machinery) and labour cost (the cost of construction workers' wages, not excluding machine operators).
- In the US estimation unit uses the British unit of measurement, while the French estimation system uses the SI unit;

2.2. Overview of scientific works on price formation systems in the Russian Federation

Stepanov I.S. [6] said that according to current regulations, the construction estimate is the sum of the construction cost and the norm profit.

\[ G_{cd} = G_{cd-et} + LN \]  
(1)

Where: \( G_{cd} \) - construction estimates; \( G_{cd-et} \) - cost of construction estimate; \( LN \) - Norm profit

\[ G_{cd-et} = CP_{it} + CP_{gt} \]  
(2)

\( CP_{it} \) - Direct construction costs; \( CP_{gt} \) - Indirect construction costs

\[ CP_{it} = V + NC + M \]  
(3)

\( V \): Cost of materials; \( NC \): labor costs; \( M \): costs of construction machines.

\[ CP_{gt} = CP_{hc} + CP_{tcct} + CP_{cn} + CP_{k} \]  
(4)

\( CP_{hc} \) - administrative costs; \( CP_{tcct} \) - construction organizing expenses on the work; \( CP_{cn} \) - expenses for construction workers; \( CP_{k} \) - other expenses.

Grabovyy P. G. [7] The synthesis of theory and reality shows that in the Russian Federation (Russia), there are two viewpoints or approaches to form construction prices: the first approach advocates to strengthen the controlling role of the state, and the second approach, by contrast, only forms market mechanisms to regulate prices.

In Russia before 2008, the state did not control the cost of construction of works using state capital, the estimated construction cost norms were for reference only. There are no analytical tools to evaluate construction works in the project preparation stages, so in the stage of the allocation of state allocation budget decision making process and the project designing stage, total construction investment is incorrect. As a result, the actual construction price is greatly different from the total initial construction investment, even exceeding 200%. [7].

In order to solve this problem, from 2008, the function of controlling the process of forming construction costing expenses was transferred to the Ministry of Development of the Russian Federation. A regulation on the establishment of a Federal Statistical Indicator Statistical Center in which these cost norms are applied to determine the total construction investment/cost estimate of works that use State capital, as well as reporting regulations, providing data on the cost estimates included in these indicators to control and update. Today, all targets of sectoral and local construction cost estimates, prior to application, must be approved by the Russian Ministry of Development of the Russian Federation in accordance with the targets of federal costs.

Regulations of the Russian Ministry of Construction [8, 9], Feifei GU [10] show that construction cost estimates are calculated at 2000, then adjusted according to the price index or current price. In Russia, the basis of the construction estimate is the 2001 estimate norm, which allows estimation by two methods, the price index method and the weight calculation method, from the design using current prices.

2.3. Overview of scientific research on price formation systems in Vietnam

Do Duc Thang [11] summarises state management tools on construction investment costs:
- Legal tools on construction and investment;
- Tools of construction norms, construction prices, construction price indexes, construction investment rates;
- Administrative management tools.

State management of construction investment expenses includes 04 following main contents:
- The promulgation and organization of the implementation of the system of legal documents on management of construction investment expenses
- The work of promulgating and announcing norm tool targets and construction prices;
- State evaluation of construction investment costs;
- State inspection and examination to assess the performance of construction investment cost management

The current cost management mechanism is that the state enhances the "pre-check" stage but still tightens the "post-checking" stage.

Pham Van Khanh [12] evaluates the norm system and construction costs is still deficient. The updated published construction norms are not appropriate for the market mechanism, have not kept pace with changes of new construction standards and regulations, and have been basically applied only to projects using government fund. The current construction unit price does not guarantee the principle of correctness and adequacy to suit construction conditions and market prices in construction areas, without clear allocation of fixed costs, variable costs, and tied to the price of the bidding package. In addition, the calculation of the unit price is not guaranteed, lack of information on the database, the market price of construction as well as invested capital and general construction unit price...

Kureyama Hideki [13] commented comments that there are many irrationalities in the norm system being applied when in Vietnam, excluding the amount of purchased materials. The same material, such as iron and steel or cement, whether the contractor purchases it in large or small quantities, is still the same price.

Norms were built too long, not updated so outdated. The manipulation of the subjects, through the inspection showed very messy, mainly increased the cost estimates, leading to negative, capital loss. Ngo Tri Long [14] assessed that the norm system was outdated, not suitable for the development of current construction technology and equipment. There is a lack of a baseline system of labor and machines productivity, equipment for determining unit prices and estimates. The current construction unit price does not ensure the principle of correctness and adequacy of construction conditions and market price in construction sites, without transparent allocation of fixed and variable costs.

Bui Pham Khanh [15] proposed the reestablishment of construction norms and prices, urban technical infrastructure services need to keep up with the development of science and technology, corresponds to building industry standards and market mechanisms. The construction of a norm system and construction prices must be inheritance, correct and sufficient in order to ensure the forecasting of objective factors of the market and international integration.

Tran Kim Bich [16] commented: “In important items, the contractor associate with the investor to temporarily pay the costs. However, this temporary payment is not enough for the contractor to carry out the project. The closer to the end of the project, with the norms are not suitable, or there are no norms, will cause the cash flow backlog, making it more difficult for contractors to deploy construction.”. Moreover, with the current payment mechanism by the State, the contractor will not be encouraged to apply modern and specific technologies to ensure the construction with good quality and schedule.

Decentralization of state management of construction prices is performed in three levels [16]. The State issues mechanisms and policies related to construction price management for construction projects and public services using state capital, PPP projects nationwide. The Ministry of Construction promulgates methods of setting and managing construction prices and urban services. The Ministry of Construction may issue investment capital and general price of construction structure parts, construction price indexes, construction planning prices, project management and construction investment consultancy costs use all over the country.

The Ministry manages specialized construction works, promulgate specialized construction prices, and applies the regulations and methods issued by the Ministry of Construction.

The provincial People's Committee issues the price of urban construction and services applied in the local area according to the regulations and methods issued by the Ministry of Construction.
Researching legal normative document on norms, construction prices and management of construction investment costs [18, 19, 20, 21, 22, 23, 24] shows that the direct management role of the State in the management of construction investment costs in this period are shown in the following angles:

(i) The State continues to instruct the mechanism for determining costs but adds some mandatory regulations to investors in managing construction investment costs.

(ii) The State continues to publish the system of targets and tools for determining expenses. However, supplementing the regulation on adjusting norms, setting new norms to serve contract payment for projects using budget capital must be approved by investors or agreed by the Ministry of Construction.

(iii) Investment costs of projects funded by State capital shall be analysed and approved by construction-specialized agencies of the Ministry of Construction, the specialized management ministries and localities or investment deciders from the total investment amounts and technical design estimates (3-step design works) or construction drawing estimates (2-step design works). At the stage of allocation of capital plans, subject to the Law on Public Investment under the medium-term (5-year) and annual plans. The investor only has the role of managing expenses after being appraised.

3. Materials and Method
3.1. Materials
The documents collected are the US set of cost estimates (RS Means Building construction cost data) and the French construction cost (Le coût des travaux de bâtiment), the method of setting construction prices in Russia and Vietnam. From here, this paper compares, evaluates and points out the inadequacies and proposes solutions to perfect the system of unit price norms of construction in Vietnam in the direction of market and international integration.

A. Estimated price set of US construction (RS Means Building construction cost data)
The set of detailed construction cost estimates is divided into 44 chapters according to CSI (Commercial Systems Integration) classification of Master Format 2004. Master Format is a system for dividing building structures and identifying all types of structure. The estimation or bidding also based on this type of structure to form the price. Detailed construction cost estimates have detailed structures and costs according to the following table:

| Company code RS Means (4 digits) | Name of the construction process | Teams | Productivity in 1 shift | Labor costs ng/g | Unit | Direct costs | Sum, including indirect costs and profits |
|---------------------------------|----------------------------------|-------|------------------------|------------------|------|-------------|------------------------------------------|
| 1                               |                                  | 2     | 3                      | 4                | 5    | 6           | 7            | 8           | 9     | 10    | 11    |
|                                 |                                  |       |                        |                  |      |             | Material | Labor | Machine | Total |
|                                 |                                  |       |                        |                  |      |             | 7         | 8     | 9       | 10   |

Column "direct cost" 7-10 represents the cost of materials, labor and constructional machines for 1 volume unit of the detailed construction price. These direct costs do not include irreparable losses, indirect costs of the project (indirect costs of contractors), insurance, salaries, indirect administrative costs of contractors, as well as profit.

The values in column 11 "Sum, including indirect costs and profits” are the sum of the following components:
- Direct expenses for construction materials with a coefficient of 1.10 for profit;
- Direct costs for worker salaries, indirect costs and profits;
- Direct cost of operating construction machines with a coefficient of 1.10;

The cost of construction materials is built by RS Means based on actual basis for collecting and analyzing data.

Wages for workers are the average of 30 US cities. Wages are taken based on the labor agreement of construction unions or according to the most common wages according to construction trades in the year of calculation. In case the local salary is different from the average salary in the unit price set or in cases where it is possible to raise the salary, it must be adjusted and supplemented accordingly.
Wages are reported annually or quarterly by 46 construction works in 314 cities in the US and Canada. The labor cost in the estimate is based on the actual data that the accounting and administrative division of the construction companies has paid to the workers.

The cost of construction machinery includes not only the cost of hiring the machine but also the costs of operating the machine under normal conditions. Machine rental costs are determined based on the analysis of North American data from contractors, suppliers, sellers, and equipment manufacturers.

In the US it is very common to set up the estimated cost of construction through the estimation of the cost per person per hour of labor for the whole team, including labor costs, construction machine fees, machine control costs, indirect costs and profits. This mechanism aims to calculate the average cost for the employees of the whole team, ensuring the calculation is consistent with the flexibility in the cost of payment for each team member. Such detailed estimates were published to hundreds of teams with different components that simplified construction cost estimates by method of determining estimates from volumes and design drawings.

**B. French construction price set (Le coût des travaux de bâtiment)**

"Le coût des travaux de bâtiment" set of construction prices for quick determination of expenses for building work.

| Table 2. General construction price list [5] |
|---------------------------------------------|
| General construction price code (1) | General construction price (2/3) €  |
| Component work code (5) | Unit of measure for component work (6) | Component work name (7) | Number (8) | General construction price (9) | Cost of production materials (11) | Waste of labor (13) | Waste of labor (13) = (4x9) |
| (1) | (2) | (3) | (4) | (5) | (6) | (7) | (8) | (9) | (10) |
| General construction price, excluding VAT (15) | Total (16) | Total A (17) |

It is noted that column (18), the formula for adjusting the aggregate cost estimates for local conditions: 

\[ [(A x B x C) + (D x E)] x F = Unit price / construction price adjusted by locality (18) \]

- Waste of labor needed to perform a combination of tasks (17);
- Unit price of local labor time;
- The indirect cost factor adjusts the local labor costs;
- Total cost of production materials in the aggregate construction price is complete, excluding indirect costs and profits (16);
- The indirect cost coefficient adjusts the costs of production materials;
- Adjustments for profits and unforeseen expenses.

Analysis of the US and French estimation sets shows that there are some similar approaches between them.
- The names of the construction costing sets without the term "norm" are completely consistent with the market principles;
- The authorities do not approve nor are they obligated to apply these construction cost estimates;
- Construction conditions are most commonly described. The authors of these cost estimates use relatively free terms;
- In these estimation sets, workers are not classified by worker grade. The table compares the working hours based on the occupation of the worker (excluding the extra workers) is given below.
Table 3. Comparison table of working hours by workers [5]

| No. | Type of work            | French norm set, € | US norm set, $ |
|-----|-------------------------|--------------------|----------------|
| 1   | Construction and installation | 23.61              | 42.15 (builder) |
|     |                         |                    | 46.80 (steelworker) |
| 2   | Plaster                 | 23.61              | 37.30          |
| 3   | Steel structure         | 24.77              | 46.90          |
| 4   | Water supply and drainage | 24.85              | 52.05          |
| 5   | Electrical engineering  | 24.57              | 49.00          |
| 6   | Wood texture. Carpenter | 24.56              | 41.55          |
| 7   | Paint in house and finishing works | 24.13          | 35.35          |
| 8   | The work of glass and mirrors | 24.58          | 40.2           |
| 9   | Lining work             | 24.87              | 39.35          |
| 10  | The highest unit price  | 28.80 (insulation work) | 61.70 (lift assembly) |
| 11  | Lowest unit price       | 23.61 (general construction jobs) | 35.40 (roofer) |

C. Estimation system of the Russian Federation

The study of Grabovyy PG [7] and the legal provisions [8, 9] show that the construction estimate system issued by the Russian Ministry of Construction and the Russian Ministry of Regional Development is mandatory to apply to the investors for capital construction projects funded by state capital regardless of the type of enterprise. For projects using other capital, for reference only. The estimated cost of construction in localities should be consistent with the federal cost targets. The cost estimates of construction in localities approved by the Regional Development Ministry are publicly announced on the Ministry's website, whereby any member interested in the construction market is easily accessible.

In different stages of the investment process, people use different types of indirect cost criteria: a) Total cost criteria by type of construction works (civil, industrial, traffic) ...); b) Expenses by type of construction work; c) Specific expenses of the enterprise. Indirect cost norms by type of work are directly proportional to the labor costs of construction: from 80% of manual land construction, to 155% of concrete work in civil construction. For construction repair work, it is much lower: from 75% to 108%.

Depending on the design steps, different types of profit cost criteria are used: a) The target of the general profit expense by department; b) Cost norms by type of construction work; c) Target cost of own profit of the business. The target of the general profit by department for construction is 65% of labor costs (direct labor and mechanic workers), for repair is 50%.

Expected cost norms of profit by type of work, proportional to labor costs of construction and installation: from 45% of manual land construction, to 100% of concrete work, reinforced concrete in civil construction. For repairing, it is much lower: from 45% to 80%

3.2. Method

Semenova Yu.A. and Petreneva O.V. [2] assume that there are many methods of determining construction prices in countries around the world, they can generally be divided into two main groups of methods: 1) Methods of determining construction prices according to detailed components are applied mainly when design steps have been completed; 2) Determination methods of combined construction prices, applied at the initial steps of the investment process, without detailed design.

Regarding the approach to the process of forming the current construction price: the first viewpoint advocates to strengthen the control role of the state, the second viewpoint, on the contrary, only forms market structures to regulate prices.

Grabovyy P. G. [7] in the Russian Federation is similar to Vietnam, people use three methods of determining construction estimates.
- Method of determination by weight and waste of materials, labor, constructional machines and equipment and price list of materials, labor costs, machine prices and corresponding constructional equipment;
- The method of determination is based on the volume and consumption of materials, labor, necessary constructional machines and equipment and the price list of materials, labor, machine and constructional equipment, and price index;

- Method of determination by volume and construction price (detailed construction unit prices are not complete and general construction prices are not complete) and price index

the basic of estimated norm set is estimated norm. Estimated norms are a set of resources, for example labor costs, working time of constructional machines, materials, and structures necessary for a working unit. The estimated norm for essential tasks: determining the amount of resources needed to perform the task, in which the resources need to be minimal but sufficient. Thus, the estimated norm is not dependent on inflation, so it may increase the accuracy of the calculations.

Documents needed to calculate construction cost estimates include:
- Design records, description of design;
- Estimated norm set.

The main principle to build the price formation system in Russia:
- Funding and market conditions are directly related to the price;
- The state controls the wholesale price of resources;
- The estimated cost depends on the method of construction and installation as well as the amount of resources.

- Methods of forming cost estimates and work construction cost estimates must not contravene regulations issued by the Ministry of Construction.;
- The contractor's costs can be calculated only during the construction process in the form of unforeseen costs, their value depending on the construction volume and the cost of equipment assembly

The norms for determining construction estimates are based on the principle of average resources and the minimum wastage of these resources. In particular, reducing the amount of resources is not possible. In projects which technology uses work not included in the estimate norms, it is possible to set up separate norms. The construction of separate norms must be approved by contractors, investors and design consultants.

4. Results
4.1. Advantages and disadvantages of price formation system in construction in Russia, Europe, USA

In industrialized countries with market economies, the nature of determining construction cost estimates is real and forecasted prices, the basis of which is national statistical data, completed contracts, set of annual norms and... In addition, mandatory price control is enforced.

| Table 4. Comparing price formation system in construction in Russia, Europe, USA [3] |
|-----------------|-----------------|-----------------|
| Russia          | Europe (represented by Germany) | USA              |
| According to the average and difference | Very large difference is calculated as a minimum average |
| The Russian estimate norm includes a large number of detailed unit prices that are averaged but not different | |
| Estimation norms may be modified if necessary. The required condition is that the new cost estimate norm must be based on scientific and practical studies, foreign experience, etc | German estimation norms are regularly renewed and perfected, with changes of modern requirements, accordingly, the average norm is established, and then the aggregate norm. As a result, the system remains consistent and interconnected | Unit price sets (in the US, there are 16 unit price sets with more than 165,000 unit prices) without approval, not mandatory. Americans think it is complete and well-grounded. |
| Principle of formation | Stable and flexible | |
| Annually, the Ministry of Development | Germany's cost norms are finalized | Every year, the norms will be |
Russia | Europe (represented by Germany) | USA
---|---|---
the Russian Federation approves the plan to set up the cost norms. The set of estimated norms is considered to supplement types of constructonal machines and equipment, construction materials, new equipment, etc. | with changes in unit prices and prices once a quarter and reviewed completely once a year. | changed according to production and business activities

### According to the information level of the norm

| The Russian estimation norm is relatively concise, including specific figures on construction and installation costs, material costs, labor costs, indirect costs, estimated profits and information on machinery and equipment | The German cost estimation system includes all necessary information about necessary resources, namely brand, type, supplier, classification, quality, v.v… In addition, the description of team composition, parameters of component structures, components and structures of indirect costs, construction machines and equipment | The norms include all information of the workers' teams, labor waste norms, and properties of construction structures.

### By type of cost norms

| In Russia, there are many different standard norms for construction materials and construction machines | There are general regulations, detailed cost estimation norms, general construction norms (there are no provisions on the formation of estimated prices, but there are standards such as “the Bill of quantities” stipulating the order of cost estimation). | - Set of construction price norms, including average construction time norms;
- Building Codes
- Standards

### By type of cost constituting construction estimate

| Design cost, labor cost, construction machine cost, material cost, indirect cost, norm profit. In addition, there is the cost of land, the cost of obtaining permits and approvals, taxes, fees, insurance, bank interest rates., expenses for selling securities, making and evaluating examination documents, organizing and executing examination. | Design expenses, construction and installation cost estimates, equipment expenses, extraordinary expenses and other expenses | Design expenses, construction cost estimates, equipment expenses, unforeseen expenses, financial expenses and limits expense

Some basic German norms are as follows:
- DIN 276 Kosten im Hochbau và DIN 277 Grundflächen und Rauminhalte von Bauwerken im Hochbau;
- HOAI (Honorarordnung für Architekten und Ingenieure).

To plan costs, people use norms DIN 276, DIN 277. The DIN norm is a mandatory document for all members of the construction investment process. The construction cost plan is made according to the design and construction steps. For each stage of the investment activity, the approximate construction cost is adjusted according to the accuracy of the results. DIN 276 is the basis of step-by-step planning, using the cost-division method by design and construction.

### 4.2. Some inadequacies of the construction price formation system in Vietnam

Researching many documents [11, 12, 13, 14, 15, 16] shows that the system of forming construction estimates of Vietnam is still slow to innovate, there are some shortcomings, such as:
- Although many years ago, the norm system has always been updated and supplemented, but has not kept up with innovation practices. The norm system is not compatible with the technology, materials and equipment becoming more and more modern and developed;
- Current construction unit prices are not suitable with construction conditions and market prices in construction areas;
- The management of construction investment expenses does not have specific rules defining structure structures. The division of structural elements in cost calculation is usually only based on the experience of valuation experts. When making cost estimates, construction pricing experts often dissociate volumes by different parts to set different prices to ensure their own interests;
- The setting of prices according to normative tasks still has many shortcomings such as failing to reflect the progress factor, affecting the price of works when using the system of estimated construction unit price norms. For works that need fast progress, the cost will be increased, but in the estimate of using norms will not show that. At present, many new norms have not been announced, making it difficult for investors to formulate construction prices;
- There is still an imbalance in the supply and demand of materials, the price of some inputs on the market increased sharply in some periods, affecting the progress and quality of the works, leading to an increase of construction investment. Meanwhile, the local price announcement system is slow to update, making it difficult to manage the cost of the construction. (Prices of many types of construction materials such as gasoline, iron and steel, asphalt, cement, sand, stone, gravel, bricks, wires, cables, wood, and glass increased sharply in 2007-2008; Sand prices increased abnormally at the end of 2017 and 2018);
- For construction workers, the current announcement of labor prices in localities by workers’ grade is not really compatible with the actual payment method for construction workers. In fact, the rate of labor force participating in the construction market through training is low; lack of skilled labor in a number of complex technical projects, a lack of skilled workers and the ability to master modern machinery and equipment.
- The government has not yet issued a set of general construction unit prices, so engineers set and determine the general construction unit price by adding up the detailed unit prices together.. This makes the estimation time longer and complicates the problem.

4.3. Proposing to renovate the system of formation and management of construction prices in Vietnam

Studying the experience of setting construction prices in developed countries and analyzing the inadequacies of the current construction price setting system in Vietnam shows that the renewal of this system in Vietnam is necessary.

The model to formulate construction cost estimates should be based on the following three basic principles: 1) To build an accurate, transparent and regularly updated database; 2) To apply the method of determining construction costs suitable to each project implementation stage; 3) To ensure benefits between the parties when participating in construction investment activities.

This model guarantees the interests of the state, as well as market members: The State is able to use its budget effectively, and the market purifies members who are unable to find effective economic solutions.

Within the scope of the article, there are some solutions as follows:
- A specific construction structure part should be developed to guide the formation and management of prices according to the structure component to ensure consistency in the management of construction investment costs and construction cost. Constructing a specific system of criteria for dividing specific structural elements to apply to all types of works uniformly applied;
- Building a common database on prices of construction jobs and structural parts of works already constructed and accepted for flexible management. The source of data on detailed unit prices is unit prices according to previously performed contracts, officially published national statistics, as well as set norms published by enterprises every year;
- The State should give priority to controlling the price formation process through the management of construction prices, not the norms to ensure the encouragement of the application of science and technology and raise the labor productivity of Vietnam contractors;
- It is necessary to promulgate and update calculation methods and formulate construction prices through basic productivity norms. When using the baseline productivity norm, combined with the market price of materials, labor and construction machines for the system of structurally divided parts of works, the price formation will meet the factors of quality and specific project schedule to ensure correctness and full cost;
- Set up a database of locations and prices of bulk material mines based on localities for good management and no price surge. For other materials, it is necessary to develop an updated, supplemented database which timely announces prices based on the market reality for the sake of the users.
- Promote the advanced training, retraining, expansion of forms of high-quality human resources training for the construction industry, meeting the requirements of providing human resources for key and large-scale projects which are featured with complex technology and high demands on construction techniques. Determine criteria for the utilisation of trained personnel for state-managed projects.
- Develop salary mechanisms and incentive policies for construction industry workers in accordance with specific industry conditions and market demands, and to attract high-quality personnel
- Developing sanctions to manage, encourage and give incentives in developing the market of hiring machines and equipment, especially high-tech machines. Specialization of this type ensures increased labor productivity.
- It is necessary to encourage policies and mechanisms for energy-saving projects and hi-tech projects with practical support in administrative and financial procedures.

5. Conclusions

Compared with the price-setting system in western countries, the current approach of Vietnam and Russia has certain advantages. Based on the regulations on standards of waste of time and resources, the person determining investment in projects using state capital and organizations shall be responsible for allocating state budget have a solid legal basis to make management decisions and set rules to check the budget records. Since then, there is a solid legal basis to finalize the state budget, because this approach is standard and clear. The standardized, uniform approach allows the use of construction cost estimates as an official document for determining the cost of construction works and is used when there is a dispute between legal entities and natural persons in court.

Studying the price formation system of Russia, USA, France and Vietnam shows that it cannot be divided into good, bad, advanced and outdated systems. Each country has its own unique characteristics in building a cost management system. By comparing the above price-setting system, it is possible to find a direct dependence of this system on the characteristics of one country or another. The results of analysis of various price-forming systems have drawn conclusions about the need to develop the price system of construction cost estimates in Vietnam by building a database of actual construction cost estimates, needs renovation and regular updates (updating construction machines and equipment, new materials and structures, new technologies). Manage system of materials, equipment and machinery as well as human resource training system effectively.

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