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Interdisciplinary Faculty of Economic and Administrative Sciences

RESEARCH

Concurrence in the public bid of projects PPP, 2018

Concurrencia en la Licitación de Proyectos APP, 2018

Date received: October 22, 2021

Date approved: February 22, 2022

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Abstract

The object of the investigation is to identify the percentage of concurrence in the bidding process of the Strategy Program to Promote PPP Projects, block II, for this purpose, data mining is used as a methodology, intending to examine data public, identify patterns and answer the research question: What is the percentage of concurrence in the tender of the Strategy Program to Promote PPP Projects, Block II? Then, the results are presented, the findings are highlighted and as a conclusion, it is proposed to implement a previous stage called: prequalification, of a mandatory nature, to ensure the participation of a more significant number of bids, verify the capacity of potential bidders, gather complete proposals for technical and economic evaluation, and consider negotiation, as an alternate element. The limitation of the research is limited to the amount of data to be analyzed within block II, and as future lines of research, it is suggested to compare the processes of similar sectors within block I.

Keywords: PPP, Concurrence, Public Bid, México, Data Mining.

Resumen

El objeto de la investigación es identificar cual es el porcentaje de concurrencia en el proceso de licitación del Programa de Estrategia de Impulso a los Proyectos APP, bloque II, para ello, se utiliza la minería de datos como metodología, con la intención de examinar datos públicos, identificar patrones y dar respuesta a la pregunta de investigación: ¿Cuál es el porcentaje de concurrencia en la licitación del Programa de Estrategia de Impulso a los Proyectos APP, Bloque II?, luego entonces, se presentan los resultados, se resaltan los hallazgos y como conclusión se propone implementar una etapa previa denominada: precalificación, de naturaleza obligatoria, para asegurar la participación de un mayor número de ofertas, verificar la capacidad de los posibles licitantes, reunir propuestas completas para la evaluación técnica y económica, y considerar la negociación, como elemento alterno. La limitación de la investigación se circunscribe a la cantidad de datos a analizar dentro del bloque II, y como futuras líneas de investigación se sugiere comparar los procesos de los sectores similares dentro del bloque I.

Palabras Clave: APP, Concurrencia, Licitación, México, Minería de datos.

Introduction

This study introduces the reader to a specific concept underpinning the research: What should be understood by Public-Private Partnerships (PPPs)? This question is addressed from academic, regulatory, and international best practices perspectives. To this end, three key characteristics are identified: 1) the contractual term, 2) the financing or payment method, and 3) the social benefit. These characteristics develop within a cycle that begins with the preparation phase and ends with the implementation phase, during which the bidding stage arises. Among other principles, this stage must safeguard competitiveness and participation, as these are indispensable elements for fostering a genuine contest.

Building on the above, the second section develops the importance of participation (concurrence), followed by the justification for analyzing the PPP Project Promotion Strategy Program, Block II. It is important to clarify that the 2013-2018 National Development Plan, published in the Official Federal Gazette (DOF), was implemented during the administration of President Enrique Peña Nieto. This plan established in its fourth axis, second section, the need to eliminate barriers limiting the country's productive potential and to foster infrastructure projects through PPPs. Consequently, in 2017, the Comprehensive Strategy Program to Promote PPP Projects was launched for investment projects planned during 2017 and 2018, known as Block I and Block II.

Focusing on 2018 is justified by the fact that the projects tendered that year belonged to the same sector — the road sector — and their bidding documents allow for identifying patterns to compare levels of participation.

The methodology used is data mining, aimed at obtaining public data, identifying patterns, and answering the research question: What is the percentage of participation in the public bidding of the PPP Project Promotion Strategy Program, Block II? After developing the methodology, results are presented, findings highlighted, and a conclusion is proposed to implement a preliminary stage called prequalification.

The importance of Public-Private partnerships

PPPs have been defined as "private initiatives to finance projects" (Vicher, 2020, p. 69), aimed at delivering new or maintained goods, services, and infrastructure to society by the State (Sorace, Domenico et al., 2006). They materialize through a "long-term contract between a private entity and a government body to provide an asset or public service, where the private entity assumes significant risk, is responsible for management, and remuneration is linked to performance" (World Bank Group, 2015, p. 5). Consequently, decision-making shifts from horizontal, general relationships to more specialized, hierarchical ones (Castro Coria, 2020). This change implies that the government moves from ordering to a more parallel, almost horizontal relationship, as PPPs involve granting concessions for infrastructure, goods, and services, transferring decision-making capacity (Vicher, 2020, p. 76), especially when financing and performance-based payments are involved.

One key characteristic of PPPs is that they are long-term contracts, which require coordinated decision-making, since the Inter-American Development Bank (IDB) points out that long-term contracts become complex as initial conditions may change due to unforeseen future requirements and rules (IDB, 2020a).

The second characteristic is the payment mechanism, which must be linked to performance. Several mechanisms exist: first, the private entity may receive payment through user fees; second, periodic government payments; and third, a mixed mechanism combining both (World Bank Group, 2015, p. 21).

PPPs are especially characterized by financing projects when the government lacks resources but has obligations to fulfill — goods or services to deliver to citizens — or when resources exist but are allocated to other projects (Gómez Monge & Castro Coria, 2020). Private financing arises from scarcity of public funds. Although initial financing costs may be higher compared to fully public financing, the transfer of risk from taxpayers to the private sector's performance is critical (Garcia-Kilroy & P. Rudolph, 2017, p. 14). Accordingly, the private sector commits to maintaining service quality and efficient resource management (Engel et al., 2014).

The third characteristic is the complexity of a PPP project because its goal is to increase social welfare and investment levels in the country (LAPP, 2018, art. 2) through infrastructure and service execution. The PPP project cycle is complex, involving several phases that establish regulatory, administrative, and technical bases for preparation and implementation. The IDB emphasizes the importance of defining processes, responsibilities, and institutional coordination mechanisms (IDB, 2020, p. 6).

The importance of participation as a mechanism for involvement

The objective of any public tender is to open doors to competitiveness. A key element to achieve this competitiveness is participation, as it is essential to generate enough competitors (Fernández Ruiz, 2015). Therefore, the World Bank in its PPP project reference guide (2015, pp. 170-174) recommends:

1. Making project information available to all interested parties both in person and online
2. Providing information and clarifying doubts about the procedure
3. Establishing clear evaluation criteria depending on the project's nature
4. Setting criteria for managing problems, especially when only one or no suitable offers are received

Competitiveness together with participation are guiding principles for the bidding stage because they ensure transparency and that the public sector receives the highest number of quality offers (IDB, 2020b). International best practices recommend implementing a preliminary stage called prequalification to verify the capacity of potential bidders before the tender begins. This stage aims to limit non-competitive participants and ensure complete proposals (IDB, 2020b; Kerf et al., 1998).

In Mexico, PPPs are regulated by the Public-Private Partnerships Law (LAPP), published in the DOF on January 16, 2012, and its Regulation (RLAPP), published November 5, 2012. These binding instruments govern tender procedures and stipulate that competitions must be conducted according to the principles of legality, free participation and competition, objectivity and impartiality, transparency and publicity, and equal conditions for all participants (LAPP, 2018, art. 38).

This is highly relevant because the Political Constitution of the United Mexican States (CPEUM) establishes that concessions in their various forms are vital for the country's economic and social development (CPEUM, 2019, arts. 25, 27, 28). Therefore, decisions by authorities in this area require more rigorous analysis than usual (SJF, 2016). The LAPP aims to regulate PPP project development under the principles of Articles 25 and 134 of the CPEUM, protecting the national economy through strong, dynamic, permanent, and equitable democratic planning actions that promote economic growth and free competition in all fields (SJF, 2016). Consequently, the administrative bidding procedure must adhere to these essential principles:

> "Participation, which ensures the public administration receives a larger number of offers, thereby increasing the possibility of selection and obtaining better conditions regarding price, quality, financing, and timeliness; 2) Equality, referring to the status of bidders relative to the administration and each other; 3) Publicity, allowing interested parties access to all information from the call for offers to the final stages; and 4) Opposition or contradiction, derived from due process, enabling interested parties to engage in disputes over competing interests, challenge others' proposals, and defend their own" (SJF, 2007)

Thus, ensuring participation—and consequently the greatest number of bidders and viable proposals—is of vital importance. Therefore, authorities' decisions when preparing tender documents must be based and justified on this principle (CPEUM, 2019, art. 16). By guaranteeing participation, the aim is to increase social welfare and investment levels (LAPP, 2018, art. 2). Hence, requirements that limit competition and free participation should not be imposed (LAPP, 2018, art. 47). This essentially involves applying game theory to determine which procedural modality, given a certain information structure, can stimulate the best competition by encouraging the most rational decisions (Amster & Pinasco, 2015).

The PPP tender procedure in the PPP project promotion strategy program, Block II

For the case study, the implementation phase is analyzed specifically the bidding stage, as this stage

will select the private entity responsible for project execution. The bidding stage begins with preparing at least the following documents: the call for bids, bidding rules, the PPP contract model, annexes, technical project studies, and feasibility analyses (IDB, 2020, p. 14). Activities include publishing the call, information or clarification meetings, submission and evaluation of technical and economic proposals; the latter is split into two parts — legal and technical proposals are submitted first and evaluated by the contracting authority, followed by economic proposals (RLAPP, 2017). Finally, the award is announced, and the contract signed (IDB, 2020, p. 14).

The case study analyzed the PPP Project Promotion Strategy Program, which aimed to promote APPs (Secretariat of Finance and Public Credit, 2017) during 2017 (Block I) and 2018 (Block II). The budgeted PPP projects for 2018 (Block II) numbered eighteen (see annex 1); however, only four projects were tendered (see table 1), all within the same sector—the road sector. Additionally, one project was directly awarded and is currently in operation/execution, while the others did not proceed with the registration process.

Table 1. PPP projects 2018 (Block II) in operation/execution stage

Illicit number	Description
Secretariat of Communications and Transportation	
APP-009000959-E456-2017	Rehabilitation and maintenance of the Campeche – Merida road section, in Campeche and Yucatan.
APP-009000959-E455-2017	Rehabilitation and maintenance of the Arriaga – Tapachula road section, in Chiapas.
APP-009000959-E12-2017	Rehabilitation and maintenance of the San Luis Potosi – Matehuala road section, in San Luis Potosi.
APP-009000959-E454-2017	Rehabilitation and maintenance of the Tampico (Altamira) – Cd. Victoria road section, in Tamaulipas.
Governorship	
Direct award	Expansion and equipment of the penitentiary complex in Papantla, Veracruz.

Source: Information from the National Transparency and Access to Information Platform

The projects tendered in 2018, known as Block II, are identified by a unique, non-repetitive tender number. The four tendering processes are consistent, as they were carried out by the same sector, allowing for the identification of patterns to compare levels of competition. A key feature of the bidding phase in a Public-Private Partnership (PPP) project is negotiation. The World Bank has stated that negotiation, as a tool, should be adopted by each country based on its political and social circumstances, as it may reduce the transparency of the tendering process. Nevertheless, it considers it relevant to assess the possibility of negotiating with bidders regarding their proposals (World Bank Group, 2015, p. 165).

Methodology

This research is presented as a non-experimental, descriptive, and quantitative study. It employs data mining (DM) to transform data, facilitating its processing and interpretation (Riquelme et al., 2006, p. 2). DM has been recognized as an appropriate methodology for identifying potential risks in government procurement (Organization for Economic Co-operation and Development, 2017). It aims to prioritize results to support decision-making processes (Lorenzo Martínez Luna, 2011). Accordingly, the procedure seeks to collect data, identify patterns, and interpret the resulting knowledge (Asencios, 2004).

This research is focused on answering a specific research question and achieving the stated objective.

Research question:

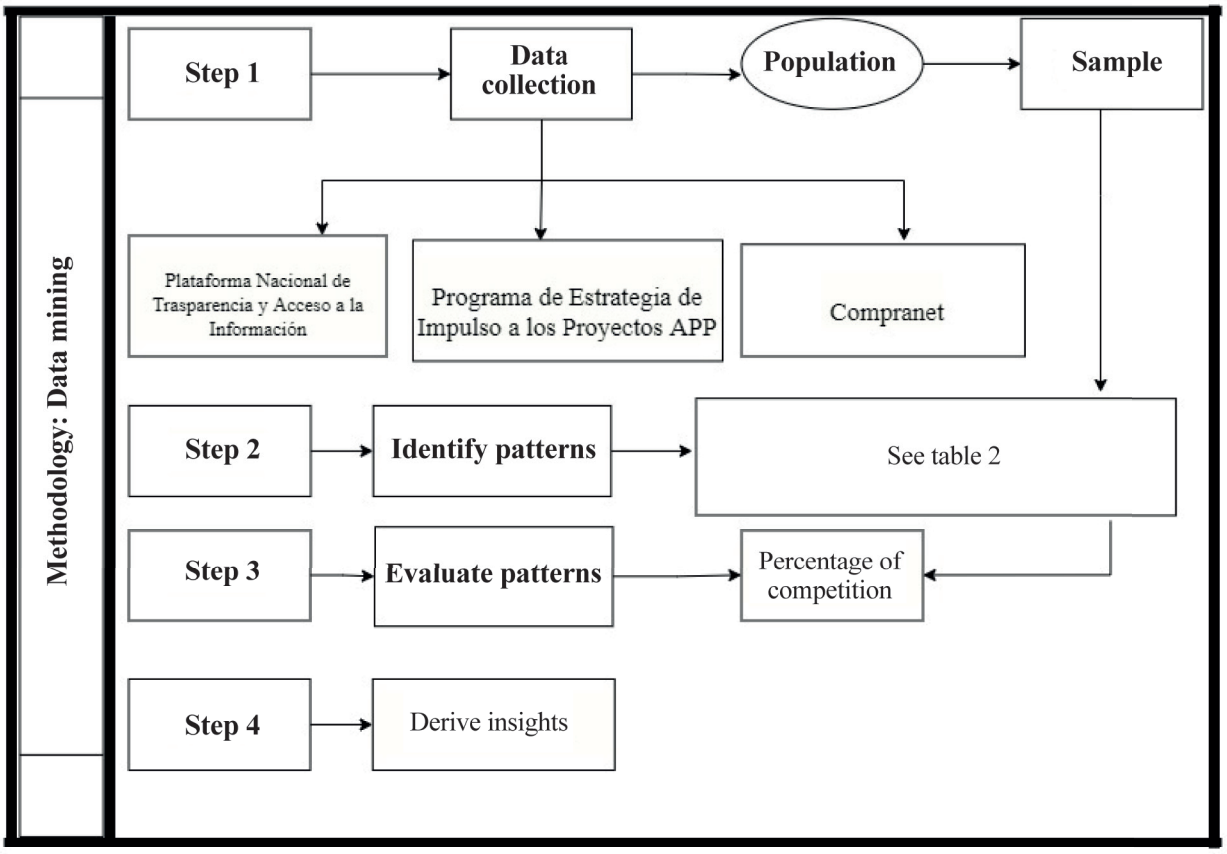
What is the level of competition in the tendering process of the PPP Project Promotion Strategy Program, Block II?

Objective:

To identify the level of competition in the tendering process of the PPP Project Promotion Strategy Program, Block II.

To answer the research question, the following steps are followed:

Figure 1. Methodological design



Source: Own elaboration based on information from Hernandez Sampieri et al., 2014; Torres Hernandez & Navarro Chavez, 2014; Vilalta J., 2016.

To obtain the data, we relied on three sources:

1. Programa de Estrategia de Impulso a los Proyectos PPP (Secretaría de Hacienda y Crédito Público, 2017) focusing on the information from block II;
2. Plataforma Nacional de Transparencia y Acceso a la Información (PNT)
3. Plataforma de contrataciones gubernamentales Compranet (Compranet), which contains a large amount of data for analysis in accordance with the LAPP(Cámara de Diputados del H. Congreso de la Unión, 2018, art. 11)

The objective was to identify the number of projects scheduled for the 2018 fiscal year (Block II). Once this was done, the national transparency platform was used to request the bidding number for each project under execution/operation, and finally, the official information regarding the bidding processes was downloaded.

To identify the patterns:

From the four PPP projects of 2018 (block II) in the operation/executation stage, as described in Table 1, and tendered by Secretaría de Comunicaciones y Transportes, the following information was extracted and analyzed:

1. Bidding documents: Execution period, evaluation type, disqualification criteria (Secretaría de Comunicaciones y Transportes, 2018n, 2018m, 2018o, 2018p)
2. Contract model: Payment and financing method (Secretaría de Comunicaciones y Transportes, 2018s, 2018r, 2018q, 2018t)
3. Technical proposal opening minutes: General participation percentage and by consortium (Secretaría de Comunicaciones y Transportes, 2018a, 2018b, 2018c, 2018d)

4. Technical proposal evaluation and financial proposal opening minutes: Disqualification criteria of technical proposals (Secretaría de Comunicaciones y Transportes, 2018e, 2018f, 2018g, 2018h)

5. Tender decision: Percentage of awards by consortium, project winners without competitor breakdown, winners with competitor breakdown, contractual amount data per winning consortium including VAT, and final participation rate (Secretaría de Comunicaciones y Transportes, 2018i, 2018j, 2018k, 2018l)

To assess or measure the patterns:

They are assessed as follows:

Table 2. PPP contracting patterns

Element	Pattern
Private actors	General participation percentage Participation percentage by consortium Participation rate per procedure Final participation rate Winners per project
Contracting form Payment method and financing	Contract amount data per winning consortium with and without VAT
Public actors	Decision criteria Disqualification criteria of technical proposal

Information from: Secretaría de Comunicaciones y Transportes, 2018c, 2018n, 2018m, 2018d, 2018e, 2018f, 2018g, 2018h, 2018i, 2018j, 2018k, 2018l, 20180, 2018p, 2018t, 2018q, 2018r, 2018s, 2018a, 2018b.

To interpret the knowledge:

The interpretation of knowledge is closely related to the objective of our research: To analyze competition in public procurement for the PPP Programa de Estragia de Impulso, Block II.

Results

As general information, prior to the specific patterns required by the methodology, it is important to note the following: the four procedures analyzed in this study have a 10-year execution term, are fully privately financed, required the presence of a social witness, and used the evaluation criterion known as points and percentages, as defined in the tender documents. All four procedures were carried out by the same contracting authority or purchasing unit—SCT-General Directorate for Road Maintenance—and overseen by the same public official: the Director of Planning and Evaluation. From the four procedures analyzed, a total of 17 concessionaires participated, submitting 24 bids in total, meaning that several concessionaires submitted bids for more than one procedure (see Table 3).

Table 3. Overall participation rate

Procedure tender number	Number of bidding consortia	Participation rate
APP-009000959-E12-2017	8	33.33%
APP-009000959-E454-2017	4	16.67%
APP-009000959-E455-2017	5	
APP-009000959-E456-2017	7	29.17%
Grand total	24	100.00%

Own elaboration based on Secretaría de Comunicaciones y Transportes, 2018a, 2018b, 2018c, 2018d

From table 3, we can deduce the following:

1. The procedure for the rehabilitation and maintenance of Tampico (Altamira) - Cd. Victoria highway section in Tamaulipas (APP-009000959-E454-2017), received the fewest technical proposals––only four.

2. Next is Arriaga – Tapachula highway section in Chiapas (APP-009000959-E455-2017) with five proposals,

3. Followed by the Campeche – Merida highway section in Campeche and Yucatan (APP-009000959-E456-2017) with seven proposals,

4. The procedure with the highest number of bidders and proposals was the San Luis Potosi – Matehuala highway section in San Luis Potosi (APP-009000959-E12-2017).

Regarding the consortia, two strategic alliances were identified: E and E.1, and F and F.1, meaning the leading consortia partnered with other companies (see Table 4). In Table 4, it is also noted

that Consortium A participated in three procedures and won one, with an individual success rate of 33.33%. Consortia D, I, and M each participated only once and won their respective bids, resulting in an individual success rate of 100%. The overall success rate for the four awarded consortia—based on the number of times they participated—is 83.33%.

Table 4. Participation rate by consortium

Consortium ID	Number of bids submitted	General participation	Winner/ Loser	Individual success rate
A	3	12.50%	Winner	33.33%
B	3	12.50%	Loser	0%
C	2	8.33%	Loser	0%
D	1	4.17%	Winner	100%
E	1	4.17%	Loser	0%
E.1	1	4.17%	Loser	0%
F	1	4.17%	Loser	0%
F.1	1	4.17%	Loser	0%
G	2	8.33%	Loser	0%
H	1	4.17%	Loser	0%
I	1	4.17%	Winner	100%
J	2	8.33%	Loser	0%
K	1	4.17%	Loser	0%
L	1	4.17%	Loser	0%
M	1	4.17%	Winner	100%
N	1	4.17%	Loser	0%
O	1	4.17%	Loser	0%
Grand total	**24**	**100%**	**4 winners**	

Own elaboration based on Secretaría de Comunicaciones y Transportes, 2018a, 2018b, 2018c, 2018d, 2018i, 2018j, 2018k, 2018l

Now, analyzing the bidding participation per procedure, and considering the full evaluation process (1. Legal and technical documentation review, 2. Financial proposal evaluation), we observe the following:

Table 5 shows that four consortia submitted their technical proposals, and only two consortia proceeded to the analysis of the financial proposal, resulting in an initial participation reduction of 50% compared to the final proposals evaluated in their economic aspect.

Table 6 shows that five consortia submitted their technical proposals, all five met the legal documentation requirements, but only two consortia proceeded to the analysis of the financial proposal, resulting in an initial participation reduction of 60% compared to the final proposals evaluated in their economic aspect, since only two were considered for evaluation.

Table 7 identifies seven consortia participating at the beginning of the procedure; however, of the seven initial consortia, only one proposal is viable for economic analysis, so the initial competition decreases by -85.71% compared to the final proposals evaluated economically. Additionally, one proposal is discarded at the stage of legal documentation submission.

Table 8 shows the process with the highest number of consortia at the beginning of the procedure; however, of the eight initial consortia, only one proposal is viable for economic analysis, reducing the initial competition by -87.5% compared to the final proposals economically evaluated.

Therefore, in general terms, the final concurrence is presented in Table 9.

Table 5. Participation rate – procedure APP-009000959-E454-2017

APP-009000959-E454-2017 Rehabilitation and Maintenance of the Tampico (Altamira) - Cd. Victoria highway, in Tamaulipas								
Consortium ID	**Technical score**	**Financial score**	**Total score**	**Amount without IVA**	**Amount with IVA**	**Legal documentation**	**Thecnical documentation**	**Financial documentation**
M	52.6	40	92.6	4,477,902,538.28	5,194,366,944.40	Compliant	Compliant	Compliant
B	0	0	0	$0	$0	Compliant	Non-compliant*	Not evaluated
N	50.6	39.71	90.31	4,512,810,220.00	5,234,859,855.20	Compliant	Compliant	Compliant
O	0	0	0	$ 0	$ 0	Compliant	Non-compliant **	Not evaluated

Source: Secretaría de Comunicaciones y Transportes, 2018d, 2018l, 2018h
Note (*) Did not meet the required coverage index (>1.10) for 2015
(**) Did not submit audited financial statements for 2015 and 2016

Table 6. Participation rate - procedure APP-009000959-E455-2017

APP-009000959-E455-2017 Rehabilitation and Maintenance of the Arriaga – Tapachula highway, in Chiapas								
Consortium ID	**Technical score**	**Financial score**	**Total**	**Amount without IVA**	**Amount with IVA**	**Legal documentation**	**Thecnical documentation**	**Financial documentation**
H	48.5	38.95	87.45	9,899,926,369.00	11,483,914,588.04	Compliant	Compliant	Compliant
F.1	0	0	0	$0	$0	Compliant	Non-compliant (*)	Not evaluated
A	0	0	0	$0	$0	Compliant	Non-compliant(**)	Not evaluated
I	47.5	40	87.5	9,639,923,130.00	11,182,310,830.80	Compliant	Compliant	Compliant
J	0	0	0	$0	$0	Compliant	Non-compliant (***)	Not evaluated

Source: Secretaría de Comunicaciones y Transportes, 2018e, 2018i, 2018a

Note: (*) Grupo Emprendedor Caltia did not provide the payment receipt for the November 2017 declaration. Sociedad Anonima de Obras y Servicios Copasa did not provide commercial background information nor the list of suppliers who have granted them commercial credits for the financing of similar projects

(**) Did not provide the written statement confirming knowledge of the work site and its conditions

(***) Constructora Marko did not submit the monthly tax declarations nor the corresponding payments for the months of February, July, and September 2017, and did not provide a copy of the certified public accountant who issued the financial statements. Servicios Mexicanos de Ingenieria Civil did not submit the payments corresponding to the 2017 tax declarations, nor a copy of the accountant's certification who issued the reports. Magnamaq did not provide a copy of the accountant's certification who issued the reports. Groupo Concesionario de Mexico did not submit the payments corresponding to the tax declarations for the months of May, June, July, August, September, October, and December 2017, nor a copy of the accountant who issued the reports.

Table 7. Competition percentage for procedure APP-009000959-E456-2017

APP-009000959-E456-2017 Rehabilitation and Maintenance of the Campeche – Merida highway, in Campeche and Yucatan								
Consortium ID	**Technical score**	**Financial score**	**Total**	**Amount without IVA**	**Amount with IVA**	**Legal documentation**	**Thecnical documentation**	**Financial documentation**
A	51.6	0	51.6	5,145,843,806.85	5,969,178,815.95	Compliant	Compliant	Non-compliant(*)
B	0	0	0	$	$	Compliant	Non-compliant (**)	Not evaluated
C	0	0	0	$0	$0	Non-compliant(***)	Not evaluated	Not evaluated
D	53	40	93	4,389,740,148.45	5,092,098,572.20	Compliant	Compliant	Compliant
E	52.2	0	52.2	6,548,885,196.67	7,596,706,828.14	Compliant	Compliant	Non-compliant (****)
F	0	0	0	$0	$0	Compliant	Non-compliant (*****)	Not evaluated
G	0	0	0	$0	$0	Compliant	Non-compliant (******)	Not evaluated

Source: Secretaría de Comunicaciones y Transportes, 2018f, 2018j, 2018b

Note: (*) Proposes standard monthly unit prices that are not applicable; the economic offer amount is affected because if the monthly unit prices are cancelled, the proposal amount is affected; there are errors related to the financial model integration

(**) (i) Does not meet financial ratios, (ii) does not include the bid bond guarantee in documentation, (iv) fails the bases and affects the validity and solvency.

(***) ICA Infraestructura omitted to include a copy of the public deed showing powers of legal representatives

(****) Monthly Unit Prices were not used to determine the "Scheduled Program of Monthly Unit Prices for 2018-2028"; (2) amounts listed for the Supervisor Manager payment do not correspond; there is an error in the financial model form date

(*****) Does not submit tax declaration payments nor commercial background and supplier's situation. Grupo Emprendedor Caltia did not present the November 2017 complementary declaration payment receipt. Sociedad Anonima de Obras y Servicios does not present commercial background nor suppliers lists that granted commercial credits for similar projects.

(******) Promotora y Desarrolladora Mexicana did not present payment receipts for complementary declarations for January, March, April, and June 2017; Desarrollo de Terracerias did not present lists of banks and/or suppliers granting banking or commercial credits for similar projetcs

Table 8. Competition percentage for procedure APP-009000959-E12-2017

APP-009000959-E12-2017 Rehabilitación y Conservación del tramo carretero San Luis Potosí - Matehuala, en San Luis Potosí								
Consortium ID	**Technical score**	**Financial score**	**Total**	**Amount without IVA**	**Amount with IVA**	**Legal documentation**	**Thecnical documentation**	**Financial documentation**
B	0	0	0	$0	$0	Compliant	Non-compliant (*)	Not evaluated
E.1	49.9	0	49.9	5,585,933,795.41	6,479,683,202.68	Compliant	Compliant	Non-compliant (**)
C	0	0	0	$0	$0	Compliant	Non-compliant (***)	Not evaluated
A	53.3	40	93.3	5,530,007,272.30	6,414,808,435.87	Compliant	Compliant	Compliant
K	0	0	0	$0	$0	Compliant	Non-compliant (****)	Not evaluated
L	0	0	0	$0	$0	Non-compliant (*****)		Not evaluated
J	45.9	0	45.9	7,021,256,159.99	8,144,657,145.59	Compliant	Compliant	Non-compliant (******)
G	0	0	0	$0	$0	Compliant	Non-compliant (********)	Not evaluated

Source: Secretaría de Comunicaciones y Transportes, 2018g, 2018k, 2018c

Note: (*) Does not comply with coverage indices for years 2015 and 2016

(**) Data regarding the monthly unit price is inconsistent with the monthly unit price catalog; there is an error in the scheduled program

(***) Does not present 2017 annual declarations before SAT

(****) Api Movilidad did not present financial statements for 2015, professional license of the accountant, nor commercial backgrounds or supplier lists; Avianza Soluciones y Movilidad did not present internal financial statements for 2017 nor the sworn statement legend; Constructora Garza Ponce did not present commercial backgrounds nor supplier credit lists; no banking or commercial backgrounds presented

(*****) Does not present power of attorney of the consortium representative elevated to public deed

(******) Inconsistencies in initial rehabilitation program, financial model; starts work on the same segment in the same month; balance sheet does not include requested social capital

(********) Does not present financial statements or cash flow for 2015 and 2016

Table 9. Final competition percentage

Procedure tender number	Number of consortia bidding per procedure	Number of consortia bidding per procedure	Reduction percentage
APP-009000959-E12-2017	8	1	-87.500%
APP-009000959-E454-2017	4	2	-50.000%
APP-009000959-E455-2017	5	2	-60.000%
APP-009000959-E456-2017	7	1	-85.714%

Source: Secretaría de Comunicaciones y Transportes, 2018a, 2018b, 2018c, 2018d, 2018e, 2018f, 2018g, 2018h, 2018i, 2018j, 2018k, 2018l

Finally, regarding the most common reasons for discarding proposals, the following stand out:

1. In the legal section, two consortia omitted to present a copy of the public deed showing powers of legal representatives, and the consortium representative's power of attorney was not elevated to a public deed.
2. In the technical section, nine consortia were disqualified for failing to submit payments of tax declarations, commercial background information, supplier lists granting commercial credits for similar projects, and the public accountant's copy who issued the reports.
3. Three consortia failed to meet coverage indices, and one did not submit a written statement acknowledging knowledge of the work site and conditions.
4. In the economic section, four consortia had inconsistencies in unit prices and scheduled programs.

In summary, the winning consortia are broken down in Table 10:

Table 10. Winners by project

Tender number	Description	Participant	Amount without IVA	Amount with IVA
APP-009000959-E456-2020	Rehabilitation and Maintenance of the Campeche – Merida highway, in Campeche and Yucatan	Consortium: Calzada Construcciones S.A. de C.V.; Construcciones y Dragados del Sureste S.A. de C.V.; Construcciones Urales S.A. de C.V; Cointer Concesiones México S.A. de C.V., and Icapsa Infraestructura y Desarrollo S.A. de C.V.	$4,389,740,148.45	$5,092,098,572.20
APP-009000959-E455-2020	Rehabilitation and Maintenance of the Arriaga – Tapachula highway, in Chiapas	Consortium: Impulsora de Desarrollo Integral S. A de C.V., Gami Ingeniería e Instalaciones S. A de C.V. Supra Constructores S. A de C.V, and Constructora y Arrendadora Cañeros S. A de C.V.	$9,639,923,130.00	$11,182,310,830.80
APP-009000959-E12-2020	Rehabilitation and Maintenance of the San Luis Potosi – Matehuala highway, in San Luis Potosi	Consortium: Omega Construcciones Industriales S. A de C.V	$5,530,007,272.30	$ 6,414,808,435.87
APP-009000959-E454-2017	Rehabilitation and Maintenance of the Tampico (Altamira) - Cd. Victoria highway, in Tamaulipas	Consortium: Mota-Engil México S.A.P.I; Construcciones y Mantenimiento Roca S. A. de C. V; Desarrollo y Construcciones Urbanas S. A. de C. V; Grupo Rio San Juan S. A. de C. V; and Grupo R Exploración Marina S. A. de C. V.	$4,477,902,538.28	$5,194,366,944.40

Based on information by Secretaría de Comunicaciones y Transportes, 2018l, 2018k, 2018j, 2018i.

Findings

It is noteworthy that since PPPs are long-term contractual relationships, in the case study, the project execution period for the evaluated projects is 10 years. Another feature studied was financing, which should be performance-related, as well as the financing method for the bidding processes. In this case study, all projects are of the pure modality, meaning that the resources for the payment of service provision, as well as investment, operation, maintenance, and infrastructure preservation costs, come entirely from federal budgetary resources, or from the National Infrastructure Fund or other non-budgetary federal public funds (Chamber of Deputies of the Congress of the Union, 2017, Art. 3).

Regarding the elements necessary for competitiveness and participation to materialize, the findings show that:

1. The PPP project information for bidding is made available virtually to all interested parties through the government procurement platform Compranet (Cámara de Diputados del H. Congreso de la Union, 2018, art. 11; *Compranet*).
2. Information is provided, and questions about the procedure are clarified.
3. There are no established criteria for handling issues, specifically when only one economic proposal is received.

Additionally, there is no prequalification stage, which, according to international recommendations, could have been used to verify the capacity of potential bidders before the procedure, ensuring that the bidders submit complete proposals for evaluation (Inter-American Development Bank, 2020b; Kerf et al., 1998).

Conclusions

PPPs have been defined as long-term contracts between a private entity and a public entity, in which the financing or payment mechanism is performance-based. Given the scarcity of public resources, the risk is transferred from taxpayers to the performance of the private sector, encouraging the private sector to maintain service quality and efficiently manage available resources with the intention of increasing social welfare and investment levels in the country.

From the development of the research, the objective was met to identify the level of competition in four PPP projects related to the 2018 PPP Project Promotion Strategy (Block II), from which the following conclusions were drawn:

1. A total of 17 bidders participated 24 times,
2. Consortium A participated in three procedures and won one of them, with an individual success rate of 33.33%.
3. Consortia D, I, and M each participated only once, and each won in that single participation, indicating a 100% individual success rate.
4. The total success rate of the four awarded consortia, considering the number of times they participated, is 83.33%.
5. Final participation was reduced by the following percentages:
   - Procedure No. APP-009000959-E454-2017 began with 4 proposals but only 2 were evaluated economically, reducing the number of competitors by -50%. In this procedure, competitor M won.
   - Procedure No. APP-009000959-E455-2017 began with 5 proposals and only 2 were economically evaluated, reducing competitors by -60%. Competitor I won.
   - Procedure No. APP-009000959-E456-2017 started with 7 proposals, but only 1 was economically evaluated, reducing competitors by -85.71%. Competitor D won, as the only bidder with an economic proposal evaluated.
   - Procedure No. APP-009000959-E12-2017 began with 8 proposals, but only 1 was economically evaluated, reducing competitors by -87.50%. Competitor A won, as the only bidder with an economic proposal evaluated.

Finally, the disqualification criteria that contributed to the reduction in participation are related to disqualification for lack of information in the technical and legal sections, and inconsistencies in the economic section.

Theoretical and practical references highlighted in this research helped identify the PPP cycle and the implementation phase during the bidding stage, as this is the stage in which the awarded private entity responsible for project execution is selected. This phase must create the necessary mechanisms to foster competitiveness alongside participation, meaning that the public sector should receive the highest number of quality offers. To achieve this, it is recommended—following best practices—that governments implement a prior stage called prequalification and consider negotiation, especially when evaluating bidders' proposals.

In line with this, the study of the four PPP projects related to the 2018 PPP Project Promotion Strategy (Block II) reveals that the authority, in its role as the contracting entity or responsible public official, must implement adequate measures to ensure that the bidding process enables greater participation, thereby allowing for a broader range of options and better conditions in terms of price, quality, financing, and timeliness, among others.

Thus, it is proposed to implement a mandatory prequalification stage to ensure greater participation, during which the capacity of potential bidders would be verified, ensuring complete proposals for economic evaluation, and to consider negotiation when evaluating bidders' proposals.

Finally, the strength of this research lies in the use of data mining as a methodology to identify patterns in public procurement and, therefore, in the delivery of goods and services. As for limitations, the research is restricted to the amount of data analyzed within Block II. As future lines of research, it is proposed to compare the processes of similar sectors within Block I to refine the pattern analysis and improve the robustness of the results.

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Appendix I

The APP projects related to the 2018 APP Project Promotion Strategy (Block II) that were budgeted include:

1. Rehabilitation and Maintenance of the Tulum - Cancún highway segment, in Quintana Roo
2. Rehabilitation and Maintenance of the Las Brisas - Los Mochis highway segment, in Sinaloa
3. Rehabilitation and Maintenance of the Campeche - Mérida highway segment, in Campeche and Yucatán
4. Rehabilitation and Maintenance of the Arriaga - Tapachula highway segment, in Chiapas
5. Rehabilitation and Maintenance of the San Luis Potosí - Matehuala highway segment, in San Luis Potosí
6. Rehabilitation and Maintenance of the Tampico (Altamira) - Cd. Victoria highway segment, in Tamaulipas
7. General Hospital "Dr. Santiago Ramón y Cajal" in Durango, Durango
8. General Hospital in Tampico, Tamaulipas
9. General Hospital "Dr. Francisco Galindo Chávez" in Torreón, Coahuila
10. General Hospital in the Northern Zone of Mexico City
11. General Hospital in the Eastern Zone of Mexico City and the State of Mexico
12. General Hospital in Acapulco, Guerrero
13. Regulation Lagoons for the Eastern Rivers of the Valley of Mexico (NAICM)
14. Wastewater Treatment Plants in the River Basins of the Eastern Lake of Texcoco
15. Proyecto de Modernización del Servicio Metereológico Nacional
16. Modernization, improvement, and efficiency enhancement of the Los Berros Water Treatment Plant of the Cutzamala System
17. Rehabilitation, Modernization, and Maintenance of physical infrastructure for basic education in Mexico
18. Expansion and equipment of the Penitentiary Complex in Papantla, Veracruz

Apendix II

ID	Participant
A	Consortium: Omega Construcciones Industriales S. A de C.V.; Impulsora de soluciones de Infraestructura S. A de C.V.
B	Consortium: Coconal SAPI de C.V. y Operadora de Autopistas S. A. de C. V
C	Consortium: ICA Infraestructura S.A. de C.V.; ICA Constructora de Infraestructura S.A. de C.V. y Constructora el Cajón S.A. de C.V.
D	Consortium: Calzada Construcciones S.A. de C.V.; Construcciones y Dragados del Sureste S.A. de C.V.; Construcciones Urales S.A. de C.V.; Cointer Concesiones México S.A. de C.V. e Icapsa Infraestructura y Desarrollo S.A. de C.V.
E	Consortium: La Peninsular Compañía Constructora S. A de C.V.; Constructora y Edificadora GIA+A S. A de C.V.; y Operadora y Administradora Técnica S.A. de C.V.
E.1	Consortium: La Peninsular Compañía Constructora S.A. de C.V.; Constructora y Pavimentadora Vise S.A. de C.V.; Operación y Administración Técnica S.A. de C.V.;
F	Consortium: Grupo emprendedor Caltia, SAPI de C.V.; Caltia Concesiones S. A de C.V.; Sociedad Anónima de Obras y Servicios Copasa Asesorías Proser, S.A. de C.V.
F.1	Consortium: Grupo emprendedor Caltia, SAPI de C.V.; Caltia Concesiones S. A de C.V.; Sociedad Anónima de Obras y Servicios Copasa Asesorías Proser, S.A. de C.V. y Jagual Ingenieros Constructores S.A. de C.V.
G	Consortium: Promotora y Desarrolladora Mexicana de Infraestructura, S.A. de C.V.; Promotora y Desarrolladora Mexicana S.A. de C.V.; Desarrollo de Terracerías S.A. de C.V. y Prodemex Construcciones S.A. de C.V.
H	Consortium: Construcciones Urales S. A de C.V.; Infineo S. A de C.V.; Cointer Concesiones México S. A de C.V.; Compañía Constructora Mas S. A de C.V.; Icapsa Infraestructura de Desarrollo S. A de C.V.; GC Grupo Cimarrón S. A de C.V.; Técnicos Especializados de Chiapas S. A de C.V.;
I	Consortium: Impulsora de Desarrollo Integral S. A de C.V., Gami Ingeniería e Instalaciones S. A de C.V. Supra Constructores S. A de C.V. y Constructora y Arrendadora Cañeros S. A de C.V.
J	Consortium: Constructora Makro S. A de C.V. Servicios Mexicanos de Ingeniería Civil S. A de C.V. Magnamaq S. A de C.V. Proyextra S. A de C.V. y Grupo Concesionario de México S. A de C.V.
K	Consortium; Api Movilidad S.A. de C.V. Constructora Garza Ponce S.A. de C.V.; Avanzia Soluciones y movilidad S.A. de C.V.;
L	Consortium: Construcciones Rubau S.A. de C.V.; Grupo Valoran S.A. de C.V.;
M	Consortium: Mota-Engil México S.A.P.I; Construcciones y Mantenimiento Roca S. A. de C. V; Desarrollo y Construcciones Urbanas S. A. de C. V; Grupo Rio San Juan S. A. de C. V; y Grupo R Exploración Marina S. A. de C. V;
N	Consortium: Gami Ingeniería e Instalaciones S. A. de C. V; Impulsora de Desarrollo Integral S. A. de C. V; Supra Construcciones S. A. de C. V; y Constructora y Arrendadora Cañeros S. A. de C. V;
O	Consortium: Integradora Latinoamericana de Infraestructura Contructiva S.A.P.I de C.V. Grupo Edificador Baesgo S. A. de C. V; Constructora Eunice S. A. de C. V; Constructora Feluxa S. A. de C. V; Servicios de Consultoría en Infraestructura Vial S. A. de C. V; y Herrera Garnica José Félix