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When capabilities backfire: Rethinking resource-based theory in health services exports

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Abstract

In developing economies, the internationalization of health services remains limited despite increasing investments in firm capabilities and resources. Grounded in the Resource-Based View (RBV), this study explores the extent to which internal strengths—both tangible and intangible—contribute to the export performance of Colombian health service firms. Drawing on firm-level data from the national EDIT survey, we employed a mixed-methods quantitative approach combining Structural Equation Modeling (SEM) and a binary Logit model. SEM was used to identify latent constructs representing "Resources" and "Capabilities", while the Logit model estimated the marginal effects of these and other predictors on the probability of export participation. Findings show that, contrary to RBV expectations, general resources and capability accumulation do not significantly enhance export propensity. Instead, internal R&D investment emerges as the only statistically significant positive predictor of exporting, suggesting that firms focused on innovation have a competitive edge in international markets. The models also reveal that a synergy between resources and capabilities—when not strategically aligned—may even hinder export engagement. These results challenge conventional interpretations of RBV in service sectors, especially in middle-income countries, and underscore the need for innovation-oriented strategies. For both managers and policymakers, the findings highlight the importance of moving beyond capacity accumulation toward targeted investment in research, talent development, and international market readiness.

Keywords: Capabilities, Exports, Health services, Resource-Based View, Resources, Structural equation modeling.

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1. Introduction

The global trade in health services has become one of the fastest-growing segments of international commerce [1]. According to estimates by the World Trade Organization, the global value of health-related services in world trade has an average annual growth rate since 2005 of 11% [2] driven by rising demand for high-quality care, cost disparities across countries, and the increasing mobility of patients and professionals [2-4]. Medical tourism alone—one of the clearest forms of health service internationalization—attracts over 14 million patients globally each year [4] generating revenues that surpass the combined GDP of several low-income countries.

This growth has transformed healthcare into an economic development lever, especially for emerging economies that can offer competitive prices without compromising on quality. From advanced surgical procedures and fertility treatments to aesthetic and dental care, a wide range of health services now cross borders not through products, but through people. The export of health services thus encompasses not only patient travel, but also telemedicine, professional training, and remote diagnostics, increasingly delivered via digital platforms.

Yet this global expansion is far from equitable. While countries like India, Thailand, and Costa Rica have consolidated robust health export strategies [5] others remain behind. Colombia, for example, possesses a health system that ranks among the best in Latin America in terms of coverage and infrastructure [6] with a healthcare system ranked 22nd globally and among the strongest in Latin America, and coverage reaching 96 % of the population for 2020 [7]. Colombia has achieved only modest participation in the global health export market. Despite hosting world-class clinics in Bogotá, Medellín, and Cali, and offering competitive costs, Colombia accounted for less than 1% of Latin America's health exports in the last decade [8]. What prevents more Colombian healthcare providers from engaging in export activity? Beyond macroeconomic and institutional factors, this study examines whether internal firm-level capacities and resources play a determining role.

While macroeconomic and policy factors are certainly very important, this paper takes a different approach: we focus on the internal conditions of healthcare firms that may explain their limited integration into international markets. We analyze how organizational resources (such as infrastructure, technology, or human capital) and capabilities (such as innovation, marketing, and international promotion) influence export behavior at the firm level. The central research question guiding this inquiry is: What firm-level resources and capabilities determine the export behavior of healthcare providers in Colombia?

This focus is grounded in the RBV of the firm, which posits that sustainable competitive advantage arises from valuable, rare, inimitable, and non-substitutable (VRIO) resources and the capabilities to leverage them [9-12]. In the context of healthcare, these can include both tangible resources (modern equipment, specialized facilities) [13-15] and intangible assets (reputation, professional expertise, international certifications) [16, 17]. Previous studies have highlighted the importance of dynamic capabilities—such as the ability to adapt services to foreign patient expectations—as critical for internationalization [18-20]. However, empirical applications of this framework in emerging-market health sectors remain scarce and fragmented, especially those applying quantitative, multivariate methods to model the direct relationship between internal firm-level variables and export activity.

This study addresses this gap by analyzing the strategic resources and capabilities' role in facilitating or hindering export activity. Drawing on survey data and secondary sources, we apply a combined Structural Equation Modeling (SEM) and binary logistic regression (LOGIT) approach to identify statistically significant factors associated with export behavior of health services firms. In doing so, we contribute to an interdisciplinary understanding of how firms in a highly regulated and socially critical sector navigate global markets under conditions of internal inequality and limited institutional support. Based on RBV literature and prior work on service internationalization [14, 21-24] we propose the following hypotheses:

H_1: Resources have a significant effect on export performance of health services companies in Colombia.

H_2: Capabilities have a significant effect on export performance of health services companies in Colombia.

H_3: The synergy between resources and capabilities has a significant effect on export performance of health services companies in Colombia.

Theoretically, this research extends the RBV framework to a critical and under-researched sector in a developing country context. Empirically, it provides quantitative evidence on the micro-level drivers of service internationalization in healthcare. Practically, it offers policy-relevant insights for supporting the global integration of Colombian health services—a sector with proven capacity to improve national competitiveness, attract foreign income, and enhance the accessibility of advanced care.

The paper is organized as follows: Section 2 describes the research methods; Section 3 presents the results of the SEM and logistic regression models; Section 4 discusses the findings considering broader debates on development, innovation, and healthcare policy; and Section 5 outlines the study's conclusions, limitations, and future research directions.

2. Materials and Methods

2.1. Data Source and Sample

This study draws on a merged dataset constructed from four complementary sources. It combines national survey data, administrative registries, and private sector information. The Survey of Technological Development and Innovation in the Services and Commerce sectors - EDITS VII - 2018-2019 [25] conducted biannually by the National Administrative Department of Statistics (DANE), was the primary source for identifying firm-level resources and innovation-related capabilities. EDIT measures technological development and innovation practices across Colombian firms, following international guidelines from the Oslo Manual [26]. To identify the dependent variable—export activity—we used the

Quarterly Survey of International Trade in Services (MTCES) [27] also administered by DANE. This quarterly survey captures detailed information about the export and import of services, including transaction values, types of services offered abroad, and destinations. Additional firm characteristics were obtained from Compite 360 [28], a private sector platform that consolidates financial, operational, and organizational data. Variables such as firm size, asset structure, and sector classification (based on International Standard Industrial Classification -ISIC- codes) were extracted to validate the sample and enrich the explanatory models. Finally, we used the Special Registry of Health Service Providers (REPS) [29] maintained by the Colombian Ministry of Health and Social Protection, to validate that each firm in the final sample is legally authorized to provide healthcare services in the country.

The final dataset was the result of an intensive matching and standardization process. Company identifiers across the different databases were harmonized, inconsistencies were resolved, and a panel structure was built to analyze firm characteristics in relation to their export behavior. The study population includes all formally registered healthcare service companies in Colombia, as classified by ISIC codes related to human health activities.

The population frame included 3,493 healthcare companies identified through the REPS database. After applying inclusion / exclusion criteria—such as having valid and matching identifiers across databases, full records on EDIT and MTCES variables, and being classified under health-related codes (according to the International Standard Industrial Classification -ISIC) - the final sample consisted of 1,323 healthcare firms. The resulting sample is diverse in size, location, and service offerings, and is representative of the formal healthcare sector in Colombia with export potential.

2.2. Variable Selection and Operationalization

The selection of variables was grounded in an extensive review of the literature on the RBV [11, 12, 30] and the internationalization of service firm [31-33] with a particular emphasis on healthcare services in emerging markets. The objective was to empirically capture constructs related to organizational resources, tangible and intangible, and capabilities, operational, marketing, and innovation-related—that are theorized to influence firms' export performance [14, 34].

The main dataset used was the EDIT Survey, that comprises over 1,300 variables, encompassing firm-level information on R&D investments, innovation processes, human capital development, technological acquisitions, and management practices. From this extensive set, a preliminary screening identified 65 variables that could conceptually relate to the theoretical categories of resources and capabilities. Complementary data were extracted from three additional sources: (1) the Quarterly Sample of Foreign Trade in Services (MTCES), which provided export data (value and occurrence); (2) Compite360, a database which contributed information on firm size and industry classification; and (3) the Special Registry of Health Service Providers (REPS), which helped validate the sector classification of sampled firms.

To reduce the number of variables and ensure empirical robustness, a three-stage filtering process was employed. 1) variables with excessive missing values or insufficient variation were excluded. 2) theoretical mapping was used to align candidate variables with specific constructs based on prior literature [35, 36] 3) exploratory correlation and factor analysis supported the final selection of seven independent variables that showed acceptable variance and conceptual coherence with the RBV framework. These variables are shown in Table 1.

Table 1.
Operational Definitions of Variables Used in the Quantitative Model.

Independent Variables		
Resource or capability	**Explanation**	**Name of the variable**
Investment in Marketing and Sales	As a proxy for market-oriented capabilities and international visibility Narver and Slater [36] this variable reflects the firm's capacity to promote services and build international visibility through expenditure on advertising, branding, and customer outreach.	MERCADT_INV
Investment in Employee Training and Development	Reflecting the firm's commitment to human capital formation and adaptability, it measures the firm's efforts to enhance human capital through staff training, which supports innovation, adaptability, and service quality — key factors in global competitiveness Becker [37]	FORMATION_INV
Investment in Machinery and Equipment.	Indicating technological infrastructure and operational readiness, these variable captures spending on technological and operational equipment necessary for delivering specialized healthcare services, reflecting strategic assets that support competitiveness and export readiness Hitt, et al. [30].	MACHINERY_INV
Investment in Physical Infrastructure (Buildings)	Capturing the scale and specialization of healthcare facilities, it reflects the firm's investment in physical infrastructure, such as hospitals, clinics, or specialized medical facilities, which serve as strategic tangible resources enabling service quality and internationalization potential Grant [38]	BUILDINGS_INV
Investment in Software and Hardware –	Representing digital transformation capacity and information management. This variable captures the firm's expenditures on information technologies, including acquisition of software systems, licenses, computing equipment, and data processing tools essential for	SOFTWARE_HARDWARE_INV

	service delivery and innovation Narver and Slater [36].	

Table 1.
(Continued) Operational Definitions of Variables Used in the Quantitative Model.

Resource or capability	**Explanation**	**Name of the variable**
External R&D Acquisition Investment	Expenditure on externally acquired R&D, reflecting the firm's capacity to integrate external knowledge into its innovation processes [35]. This variable captures the total investment made by the firm to acquire R&D from external sources, including payments for patents, licenses, specialized consulting, and outsourced research services	EXTERNAL_R&D _INV
Internal R&D Investment –	Represents the firm's efforts to generate new knowledge and service innovations internally. It reflects the level of resources dedicated to developing proprietary technologies, improving service delivery, and fostering long-term differentiation strategies. As highlighted by Crossan and Apaydin [35]. internal R&D plays a fundamental role in building dynamic capabilities and sustaining competitive advantage in knowledge-intensive sectors.	INTERNAL_R&D_ INV
Independent Variables		
Concept	Code in the Survey	DANE Label
Exportaciones	This variable indicates whether the firm exported healthcare services during the period studied, serving as a proxy for international performance Sharma and Blomstermo [39]	Exports
Experiencia Exportadora:	Binary variable indicating whether the firm exported healthcare services during the study period (0 = no, 1 = yes) Sharma and Blomstermo [39].	
Control Variables		
Firm size	Measured as the number of employees in the firm, used as a control variable. Larger firms tend to possess more strategic resources for export engagement Bonaccorsi [40] and Escandon-Barbosa, et al. [41]	Size
Economic Sector	To classify firms within the healthcare services sector based on their official economic activity, according to ISIC. This variable was employed to ensure sectoral validity of the sample	Sector

Note: All monetary variables are expressed in Colombian pesos (COP), in millions. The values were obtained directly from the *EDIT* dataset and reflect firm-level annual investment amounts.
Source: Own elaboration based on data from EDITS 2018–2019 DANE [25].

2.3. Model Structure and Construct Definition

To identify the underlying structure of firms' internal strengths, we conducted a Principal Component Analysis (PCA) on seven investment-related variables obtained from the EDIT database. The PCA aimed to reduce dimensionality, address multicollinearity, and build theoretically coherent constructs, following methodological recommendations in the empirical literature [10]. The analysis resulted in two latent constructs. The first, Resources**,** captured tangible and technological assets, including investments in buildings, machinery, and software. The second, Capabilities**,** reflected strategic efforts oriented toward market expansion and internal knowledge development, including investment in marketing and employee training. These constructs were incorporated into a Structural Equation Model (SEM) to assess their effect on firms' export engagement. SEM is particularly suitable for this type of research, as it allows for the simultaneous estimation of multiple relationships among observed and latent variables [10]. This technique was employed to model the conceptual framework based on the RBV, where complex interactions are expected between intangible capabilities, tangible assets, and export outcomes.

SEM was estimated using the maximum likelihood method in SPSS AMOS (version 28). Model fit was assessed using multiple indices, including the Comparative Fit Index (CFI), Root Mean Square Error of Approximation (RMSEA), and the Chi-square/degrees of freedom ratio, following the criteria established by Hu and Bentler [42]. It is important to note that two variables from the EDIT—Internal R&D Investment and External R&D Acquisition—were excluded from the latent constructs due to insufficient reliability (as indicated by Cronbach's alpha and factor loadings). However, given their theoretical and strategic relevance to innovation and export performance, these two variables were retained in the SEM and Logit models as independent exogenous predictors. This approach aligns with previous studies recognizing the standalone influence of R&D on internationalization [35, 39]. Figure 1 illustrates the final model structure, where latent constructs and individual R&D investments jointly predict export behavior.

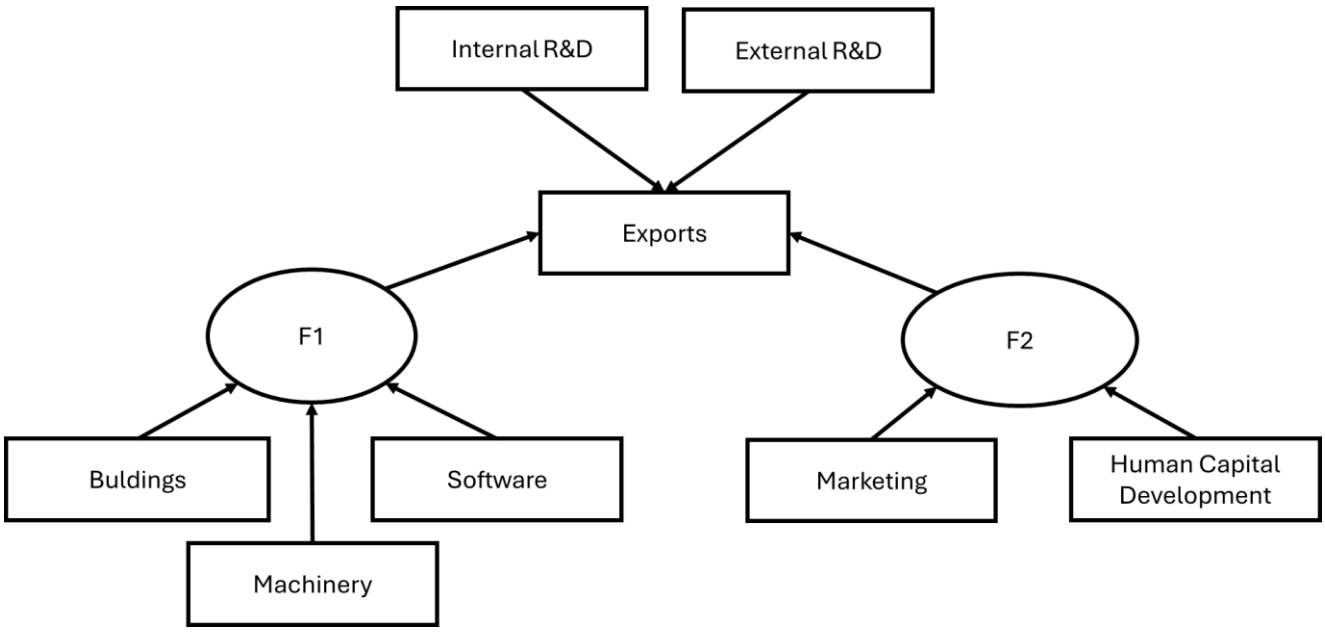

Figure 1.
Conceptual Framework: Resources, Capabilities, and Export Dynamics.
Note: The latent constructs "Resources" and "Capabilities" are estimated in relation to "Exports" via SEM; Internal and external R&D are estimated independently.

We complemented the SEM analysis with a LOGIT model that enabled us to validate the predictive power of the resource and capability constructs on the likelihood of export engagement, while controlling for firm size and economic sector. To predict the probability of a firm engaging in export activities, the dependent variable was export status (0 = non-exporter, 1 = exporter). This model was appropriate to predict factors that increase or reduce the likelihood of export engagement [43]. The use of SEM and logistic regression in tandem is well documented [44, 45]. While SEM offers a deep understanding of structural relationships and mediation effects within a theoretical framework, LOGIT enhances predictive accuracy for export behavior.

3. Results

3.1. Descriptive Analysis

The descriptive statistics of the investment variables provide an overview of how health service firms allocate their resources Table 2. The average investment is highest in machinery (129,376.59 million COP) and internal R&D (230,552.21 million COP)**,** with substantial standard deviations (497,402.46 and 865,941.04 respectively), indicating high variability across firms and the presence of outliers or asymmetries in investment levels. Interestingly, while investment in buildings (55,102.35 million COP**)** is relatively moderate, it is notably lower than machinery, which may reflect the operational nature of many health service providers who do not own property but lease clinical or hospital spaces, focusing instead on equipment acquisition. This pattern aligns with the predominance of service delivery models that emphasize operational flexibility over fixed assets.

Table 2.
Descriptive Statistics of Investment and Export Variables.

Variable	Min value	Max Value	Avg.	S.D.
MACHINERY_INV	0	5.532.586	129.376,59	497.402,46
BUILDINGS_INV	0	6.004.327	55.102,35	425.719,01
SOFTWARE_HARDWARE_INV	0	3.694.950	58.089,41	244.379,70
MERCADT_INV	0	204.259	2.776,96	14.515,45
FORMATION_INV	0	147.621	2.394,67	11.267,01
EXPORTS	0	8.327.587	46.064,02	573.402,09
INTERNAL_R&D_INV	0	3.753.776	9.314,21	119.849,20
EXTERNAL_R&D_INV	0	9.034.202	230.552,21	865.941,04
N= 1323				

Source: Authors' own elaboration based on data from the EDIT 2018–2019. All monetary values are expressed in million Colombian pesos (COP). DANE [25]

At the other end of the spectrum, marketing (2,776.96 million COP) and training (2,394.67 million COP) receive the lowest average investments. These two areas also show low maximum values and relatively small standard deviations, which suggests consistently limited allocation across firms. The low investment in marketing could be symptomatic of domestic market orientation, with few firms targeting international patients

or foreign contracts. Similarly, modest training expenditures may reflect a reliance on pre-existing qualifications or underdeveloped human capital strategies, which could constrain competitiveness abroad. The export variable itself shows a wide standard deviation (573,402.09), indicating that export engagement is highly unequal, with a few firms leading the sector while the majority exhibit little or no export activity, which was reported by approximately 13.2% of the firms.

These results provide an overview of the heterogeneity within the sample, reinforcing the need for multivariate techniques to uncover the structural relationships between firm-level investments and export outcomes [44, 45].

3.2. SEM Results

The SEM analysis revealed significant insights into the effects of internal factors on export performance. Specifically, the investment in internal R&D demonstrated a strong and positive impact on exports ($\beta = 0.917$, $p < 0.001$), emphasizing the strategic importance of in-house innovation for internationalization in the health services sector. Conversely, the latent constructs of Resources ($\beta = -0.310$, $p < 0.001$) and Capabilities ($\beta = -0.110$, $p = 0.010$) exhibited statistically significant but negative effects on exports. The coefficient associated with external R&D investment was negative yet not statistically significant ($\beta = -0.065$, $p = 0.060$), suggesting a more complex or context-specific role.

All path coefficients were estimated using SPSS, and the model demonstrated good overall fit based on SRMR and NFI indices. For comparative validation, a saturated model (where all possible paths are freely estimated) yielded indices of 1.000, as expected, while an independence model (assuming no relationships among variables) returned values close to zero—both outcomes serving as reference points that validate the presence of statistically meaningful relationships in the proposed SEM. Additionally, the analysis of covariances confirmed significant interrelations among several key predictors. A strong positive correlation was observed between internal and external R&D investments ($r = 0.570$), as well as between internal R&D and the latent construct Resources ($r = 0.490$). Positive associations were also detected between Resources and Capabilities ($r = 0.054$) and between Capabilities and internal R&D ($r = 0.300$), suggesting a reinforcing dynamic among firms' strategic investments.

These results underscore the differentiated roles of tangible resources, organizational capabilities, and innovation-specific investments in shaping the export potential of Colombian healthcare firms. Figure 2 illustrates the final SEM structure with standardized path coefficients and significance levels, and the Table 3 shows the Standardized Coefficients of the SEM.

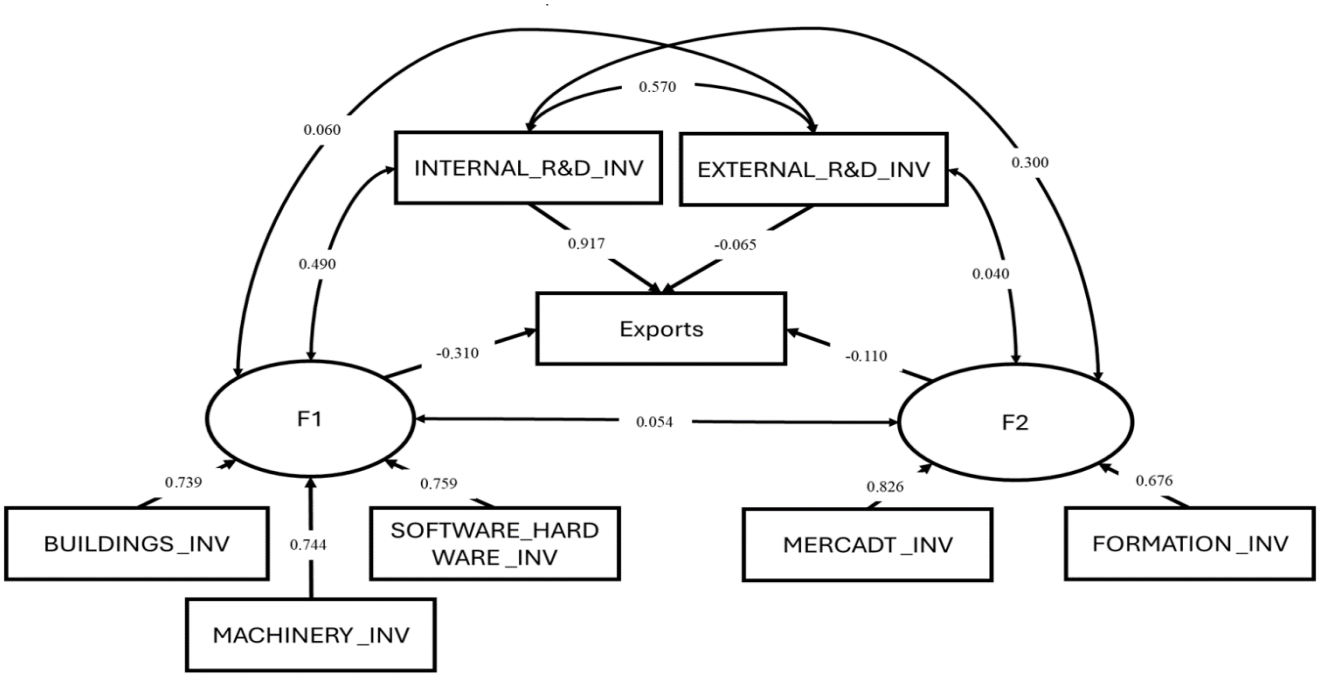

Figure 2.
SEM structure with standardized path.
Note: *All coefficients shown are statistically significant at $p < 0.05$, unless otherwise indicated. Dashed double-headed arrows represent covariances between exogenous variables.
*F1 = Resources (machinery, software, buildings); F2 = Capabilities (marketing, human capital development).
*Model estimated using SPSS AMOS 28.
Source: IBM Corp [46]

Table 3.
Standardized Coefficients of the Structural Equation Model and covariance analysis.

Variables			**R estimated**	**p**
MACHINERY _INV	<---	F1	0.744	0.000
SOFTWARE_HARDWARE _INV	<---	F1	0.759	0.000
BUILDINGS _INV	<---	F1	0.739	0.000
FORMATION _INV	<---	F2	0.676	0.000
MERCADT _INV	<---	F2	0.826	0.000
Exports	<---	F2	-0.110	0.010
Exports	<---	EXTERNAL_R&D_INV	-0.065	0.060
Exports	<---	INTERNAL_R&D_INV	0.917	0.000
Exports	<---	F1	-0.310	0.000
Covariance			Estimated value	p
EXTERNAL_R&D_INV	<->	INTERNAL_R&D_INV	0.570	***
F1	<->	INTERNAL_R&D_INV	0.490	***
F1	<->	EXTERNAL_R&D_INV	0.060	***
EXTERNAL_R&D_INV	<->	F2	0.040	0.910
F1	<->	F2	0.054	***
INTERNAL_R&D_INV	<->	F2	0.300	***

Note: All coefficients are standardized estimates derived from the SEM. Triple asterisks (***) indicate statistical significance at the p < 0.001 level. F1 refers to the latent factor "Resources," and F2 to the latent factor "Capabilities." Arrows (e.g., <---) denote the direction of hypothesized effects. Double arrows (<->) indicate covariance relationships between constructs or variables. Source: Authors' elaboration based on data from EDIT.

3.3. Results from the binary Logistic Regression Model

Given the relatively low proportion of export firms in the dataset (13.2%), a LOGIT was employed to examine the probability of exporting. This approach allows for the identification of statistically significant predictors of export engagement while controlling for other variables. Specifically, the regression was estimated using marginal effects to improve interpretability, given the challenges of interpreting log-odds directly. The logistics estimate the probability that a firm will export (coded as 1) versus not export (coded as 0), based on key predictors. The model is specified as follows:

$$P = 1\ (1 + e^{-y})$$

$$y = \beta_0 + \beta_1 + x_1 + \beta_2 + x_2 + \beta_3 + x_3 + \beta_4 + x_4 + \beta_n + x_n + \cdots + U$$

Where:
y: Linear predictor of the log-odds of exporting
x_1: Capabilities (Factor 2)
x_2: Resources (Factor 1)
x_3: Internal R&D Investment
x_4: External R&D Investment
β_o: Intercept (cutoff point)
U_i: Error term
β_n: Change in the log-probability of exporting associated with a one-unit change in each predictor, holding other variables constant.

To enhance interpretability for a broader audience, the analysis focuses on marginal effects rather than raw log-odds coefficients. Marginal effects represent the change in the probability of exporting associated with a one-unit increase in the explanatory variable, holding other variables constant. This approach, recommended in econometric literature for binary outcomes [47] is particularly useful when variables are expressed in large monetary units, such as Colombian pesos.

Model diagnostics confirmed the robustness and adequacy of the LOGIT regression. First, multicollinearity was assessed using the Variance Inflation Factor (VIF). All VIF values were well below the commonly accepted threshold of 10 (mean VIF = 1.50; maximum = 1.84), indicating that multicollinearity was not a concern and that the estimated coefficients were stable and interpretable. Second, heteroskedasticity was evaluated using the Breusch-Pagan / Cook-Weisberg test. The results ($\chi^2(1) = 2.35$, p = 0.1254) failed to reject the null hypothesis of constant variance, suggesting that the error terms were homoscedastic, thus supporting the reliability of standard errors and statistical inference. Third, autocorrelation was tested via the Durbin-Watson statistics, which yielded a value of 1.95**,** close to the ideal value of 2, indicating no significant serial correlation in the residuals. These results validate the adequacy of the Logit model for analyzing export propensity.

Table 4 displays the marginal effects of the predictors on the probability of a firm being an exporter. The results indicate that: Internal R&D Investment is the strongest positive predictor. Although the magnitude of the marginal effect appears small (7.11e-08), this is due to the unit scale (1 million COP). Interpreted practically, an increase of one million pesos in internal R&D is associated with a non-negligible increase in export probability. On the other side, Capabilities (F2) and Resources (F1) show significant negative marginal effects, suggesting that increases in these dimensions, as captured in the PCA-SEM structure, are associated with a lower likelihood of exporting. External R&D Investment (INV_I+D_EXTERNAS) did not show a statistically significant marginal effect (p > 0.05), indicating a limited role in influencing export status within this sample. With these results shown in Table 4 we can infer that while general resource

accumulation may not directly enhance export behavior, targeted internal R&D investment remains a critical driver for international engagement, and, this emphasizes the critical role of firm-internal innovation processes in enhancing export readiness, while also highlighting the limitations of infrastructure-oriented investments in driving internationalization.

Table 4.
Binary Logistic Regression Results for Export Probability

Variable	dy/dx	Std. Err.	Z	P>z	[95%	C.I.]	X
PC1	-0.0003853	0.00097	-0.40	0.692	-0.002292	0.001521	-9.8e-09
PC2	0.0008362	0.00032	2.61	0.09	0.000209	0.001463	-5.0e-11
INV_EXTERNAL_R&D	7.11e-08	0.00000	-3.16	0.002	1.2e-07	2.7e-08	24373
INV_ INTERNAL_R&D	1.18e-07	0.00000	2.92	0.06	3.9e-08	2.0e-07	3591.8

Note: Coefficients are from a binary logistic regression where the dependent variable is export status (1 = exporter, 0 = non-exporter). Marginal effects represent the change in predicted probability of exporting for a one-unit increase in the predictor. All variables are centered and standardized.

4. Discussion

This study aimed to explore the interplay between internal resources, organizational capabilities, and R&D investment in explaining the export behavior of health services firms in Colombia. The proposed SEM and LOGIC models helped to understand the direct and indirect pathways influencing export probability.

The results exhibit a complex pattern of effects that challenge some established assumptions in the RBV´s view of internationalization. Contrary to expectations, Resources (F1), which included investments in tangible assets such as buildings, machinery, and software, were negatively associated with export probability. This result does not support H1 and suggests that capital-intensive investments may not directly translate into greater international competitiveness in the health services sector. One plausible explanation is that such investments might reflect a focus on domestic operational scaling or infrastructure modernization rather than international expansion.

Similarly, Capabilities (F2), reflecting strategic investments in marketing and human capital development, also showed a statistically significant but negative association with exports, contradicting H2. While these two variables are typically framed as drivers of competitiveness, this result might indicate a misalignment between capability development and export goals, or a possible overinvestment in activities that do not translate efficiently into international value propositions. These findings echo results from studies in other emerging economies, where non-exporting firms often overinvest in capabilities without a clear export strategy [40, 41, 48, 49].

In contrast, internal R&D investment (developing proprietary technologies, improving service delivery, and fostering long-term differentiation strategies), emerged as the strongest positive predictor of export behavior in both the SEM and the Logit models. This finding aligns with recent literature emphasizing the role of firm-level innovation and absorptive capacity in enabling successful internationalization [50-52]. Thus, although H3 - which hypothesized a positive synergy between resources and capabilities - was not supported in its original form, the prominence of internal R&D points to the importance of integrating knowledge-based assets into strategic planning for international markets.

4.1. Implications for Theory and Practice

These findings contribute to the ongoing refinement of the RBV and dynamic capabilities framework in the context of service internationalization. Specifically, they highlight that *not all resources and capabilities are equally export-enabling*. The traditional RBV may overemphasize static asset accumulation [53, 54] whereas our results suggest that strategic investments in R&D and innovation may represent more export-relevant assets, this is also supported by some authors like [55, 56]. Additionally, the lack of synergy between resources and capabilities implies that these two must be aligned strategically rather than simply coexisting.

For policymakers and business leaders, the results underscore the need to shift support mechanisms from infrastructure development toward in-house innovation systems. Export promotion programs may be more effective when tied to R&D grants, innovation training, and capability alignment with international standards. Firms should critically assess whether their resource allocation patterns are truly supporting global competitiveness or merely reinforcing domestic operations.

4.2. International Comparisons and Critical Reflection

These findings resonate with studies from other Latin American countries, such as Brazil and Mexico, where export success in services has been more closely linked to process innovation and niche specialization than to scale or infrastructure investments [57, 58]. In contrast, firms in developed economies often benefit from institutional ecosystems that better align resource endowments with export readiness [59].

Our findings challenge conventional assumptions of the RBV, which posits that firms gain competitive advantage through the accumulation and strategic deployment of valuable, rare, inimitable, and organizationally embedded resources and capabilities [11, 60]. Classical and recent studies alike have consistently emphasized that VRIO resources are central to enhancing competitiveness, including international performance [61, 62]. However, this study raises several questions regarding the alignment between firm strategy and export outcomes in developing economies. The negative effects of both

capabilities and resources on export performance—although counterintuitive from an RBV perspective—may indicate that firms in the Colombian health services sector are accumulating resources and developing capabilities without a coherent internationalization roadmap. In such cases, resource and capability development may not translate into export readiness and may even hinder performance due to misallocation or strategic incoherence.

Our findings challenge conventional assumptions of the RBV, while classical and recent studies alike have consistently emphasized that VRIO resources are central to enhancing competitiveness in the services sector, including international performance [60, 63] our findings suggests that not all resources are export-enabling, and that international competitiveness depends not only on the presence of assets, but on their purposeful configuration and deployment within the context of global markets [64, 65]. The low proportion of exporters in the sample further reflects a structural limitation of the Colombian health services sector, where internationalization remains the exception rather than the rule. This highlights the need for more context-sensitive analyses and qualitative research to understand how firms conceptualize and implement resource-based strategies in environments with limited international exposure.

5. Conclusions

This study examined the influence of internal resources and capabilities on the export performance of health service firms in Colombia, contributing to the broader literature on innovation, competitiveness, and internationalization in emerging markets. Drawing upon the RBV, we hypothesized that both resources and capabilities would positively influence export activity, and that their synergy would amplify this effect. However, the empirical evidence obtained through structural equation modeling, and a complementary binary logistic regression model revealed counterintuitive patterns. We partially confirm the RBV: while internal R&D aligns with VRIO principles and enhances export probability, the general accumulation of resources and capabilities may not be sufficient without strategic orientation toward international markets. This divergence calls for refined theoretical models that better account for the institutional, regulatory, and structural constraints faced by firms in developing countries.

Specifically, internal R&D investments emerged as the most robust positive predictor of export engagement, while broader categories of resources (e.g., physical infrastructure and technology) and capabilities (e.g., marketing and human capital development) were found to have negative or nonsignificant effects on export performance.

Building on these findings, strategic implications emerge both at the firm and policy levels. At the firm level, the main recommendation for managers is to smartly shift investment toward innovation capabilities, international marketing, and human capital development and training by: (1) Fostering innovation through invests in research and development of new services, adopting advanced technologies (e.g., telemedicine, AI-assisted diagnostics), and optimizing patient care processes [35] (2) Developing international marketing capabilities by building strong brands [66], designing targeted communication strategies for foreign markets [67, 68] and establishing distribution channels and strategic alliances to reach international patients [69] (3) Enhancing human capital through continuous training programs for medical and support staff—not only in technical skills, but also in soft skills, foreign languages, and cultural awareness to meet the needs of a diverse international clientele [37] and (4) Leveraging technology not merely as an acquisition of hardware and software, but through the effective integration of digital tools into service management and delivery to improve efficiency and quality [70].

At the policy level, our findings suggest several actionable directions for public decision-makers: (1) Creating incentives for health-related R&D, such as competitive grants or tax exemptions for projects focused on exportable health innovations; (2) Promoting specialized training programs that prepare professionals for the international health market (e.g., medical tourism, international patient management); (3) Facilitating market access through national branding strategies to position Colombia as a health tourism destination [71] fostering bilateral agreements for quality recognition and regulatory standards, and offering internationalization advisory services to firms in the sector; and (4) Improving the regulatory environment by revising and adapting existing laws to support cross-border service provision and technological investment. In practical terms, the results highlight the need for export promotion policies that go beyond traditional support for capacity building. Governments and development agencies should focus on enabling strategic innovation ecosystems, strengthening internal R&D capabilities, and fostering a culture of internationalization from early stages of firm development [72, 73].

5.1. Limitations and Future Research

This research is subject to several limitations. First, the dataset used (EDIT), is cross-sectional and self-reported, limiting causal inference and potentially introducing response bias. Second, the relatively low proportion of exporters in the sample reflects a structural characteristic of the sector but also constrains the generalizability of the findings. Third, while SEM and Logit models provide valuable insights, they are inherently limited in capturing the complex, dynamic interplay of institutional and strategic factors over time.

Future studies could benefit from longitudinal data and qualitative approaches to exploring how firms' strategic decisions evolve in relation to export ambitions. Case studies could illuminate why some resource- and capability-rich firms fail to internationalize. It would also be valuable to compare these patterns across sectors or countries, to identify whether the Colombian case reflects broader trends in Latin America or unique sectoral constraints. Finally, future work should investigate digital capabilities, organizational learning processes, and the role of institutional support as mediators in the resource-export relationship.

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