



Business Intelligence for Bottleneck-Sensitive International Market Entry Screening

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ABSTRACT

An international expansion team must decide which candidate markets warrant costly commercial due diligence. Regulation-only rankings can overlook the services and operating processes needed to conduct business. We develop a reproducible business intelligence screen using the three published pillars of the World Bank's *Business Ready 2025* for 101 economies. The analysis compares a regulation-led shortlist with a noncompensatory weakest-pillar rule, tests its sensitivity to shortlist capacity and alternative aggregation, and examines a mechanical one-pillar improvement scenario. Public Services is the lowest pillar in 67 economies and Operational Efficiency in 31. Regulation exceeds services by 12.36 points on average (95% bootstrap interval 10.52–14.12). The regulation-led and bottleneck-led top 20 share 11 economies, so nine due-diligence candidates change; their equal-weight and bottleneck-led counterparts share 18. Raising the lowest pillar hypothetically by ten points increases the resulting minimum by 6.63 points on average because another pillar may become binding. The output identifies markets requiring checks of service delivery or operational execution before a site-selection decision. Its rankings are transparent decision rules applied to official scores, not World Bank rankings, investment-return estimates, or evidence of causal reform effects.

Keywords: Business intelligence ▪ Business data analytics ▪ Market entry screening ▪ Decision support ▪ Operational bottlenecks

1. INTRODUCTION

A market entry committee does not need a general statement that one economy is “business friendly.” It needs to know which operating condition could defeat a proposed investment. A well-written commercial code offers little reassurance if permits, utilities, registries, or administrative processes do not deliver reliably. Conversely, a modest rule score need not imply that the practical service interface is equally weak. A one-number screen can hide the particular exposure that managers must test on the ground.

The World Bank's *Business Ready 2025* (B-READY) reports three scores for each of 101 economies: Regulatory Frame-

work, Public Services, and Operational Efficiency [1]. These dimensions support a specific business data analytics question: how many candidates in a capacity-limited market-entry shortlist change when a committee shifts from a rules-led score to an explicitly noncompensatory one? We answer that question for the full published cross-section. We also quantify within-economy gaps, identify the pillar that constrains each profile, test the stability of an equal-weight summary, and calculate a simple one-pillar improvement scenario.

This article does not introduce an official country league table. Its ranks are sample-specific outputs of two decision rules chosen to show the cost of an implicit assumption. A firm might rationally accept compensation between dimensions

for one activity and require a minimum threshold in another. Making that choice visible is the contribution. Neither rule predicts firm performance, and neither describes the quality of a particular project, sector, city, or counterparty.

2. RELATED WORK

Research on business conditions gives strong reasons to separate written requirements from the setting in which firms operate. Fu and Krauss [2] study how business environment quality relates to micro and small enterprise growth; Amoroso et al. [3] find that regional government quality conditions the relationship between regulation and high-growth firms. At the firm level, Tan and Tusha [4] examine regulatory burden together with corruption in Moldova, while Chen et al. [5] show that the relationship among bribery, regulation, and performance can vary across regimes. These findings resist an interpretation of a regulatory score as a direct profit forecast. Their units and outcomes also differ from the national pillar comparison here.

Public service delivery is a separate commercial consideration. In a study of government digitalization, Chen et al. [6] emphasize standardization of public service provision rather than the mere availability of a digital channel. B-READY reflects that distinction in its separate Public Services and Operational Efficiency pillars [1]. The report itself highlights the average public-services shortfall. Our analysis therefore does not present that aggregate gap as a new discovery; it examines its consequences for market shortlists and for specific economy profiles.

Complementarities among conditions are also plausible. In 50 Chinese cities, Xue et al. [7] use a configurational approach to study how combinations of business environment features relate to manufacturing upgrading. Liu and Feng [8] study digital government and corporate investment efficiency using firm data. Such evidence supplies a reason to inspect delivery alongside legal form, but neither result determines a universal weight for a cross-country market-entry screen. For an investor, a weak public interface might be a binding constraint in one industry and an inconvenience in another. The national comparison developed here is a way to disclose that judgment before it is buried in an aggregate score.

A second literature concerns the use of indicators in decisions. Alqararah [9] demonstrate that composite rankings can respond to choices about aggregation and weighting. Liu and Yoon [10] argue for goal-driven integration of analytical data, and Szukits and M6ricz [11] link data-driven decisions to organizational analytical culture. We apply that logic to a narrow, inspectable business choice: a regulation-led first pass versus a screen that takes the lowest of three scores. The business question, not an optimization algorithm, determines the aggregation rule. We report both the agreement and the disagreement between rules, avoiding a claim that one is universally correct.

3. DATA AND VARIABLES

The observation is an economy in the 2025 B-READY report, not a firm or an annual panel. We transcribed the three published pillar scores from Appendix A, Table A1.1, matched the independently ordered economy lists by name, and re-

tained all 101 economies with complete values. Recomputed unweighted means are 66.32, 53.97, and 60.03, matching the report's rounded means. The scores lie on a 0–100 scale. B-READY assesses ten topics using expert questionnaires and firm surveys; its measurement design and economy coverage delimit the conclusions [1]. We use the reported two-decimal values without imputation or further standardization.

4. PROPOSED ANALYTICAL FRAMEWORK

4.1 Decision Scores and Aggregation

For economy i , define the observed pillar vector $\mathbf{x}_i = (R_i, S_i, E_i)$ for Regulatory Framework, Public Services, and Operational Efficiency. A rules-led first pass sorts economies by R_i . To expose the consequence of compensating a low dimension with high ones, we construct a three-pillar mean M_i and a noncompensatory minimum B_i :

$$M_i = \frac{R_i + S_i + E_i}{3}, \quad (1)$$

$$B_i = \min\{R_i, S_i, E_i\}, \quad G_i = M_i - B_i.$$

The gap $G_i \geq 0$ describes how much the average exceeds the weakest measured pillar. The minimum represents a screening preference that a strong score in one dimension cannot offset a weaker one; it does not assert that the minimum is an estimated production function or that the pillars are perfect substitutes under M_i . Neither constructed score is an official B-READY index.

4.2 Ranking and Robustness Audit

For score $Q \in \{R, M, B\}$, descending competition ranks and top- k sets are

$$r_i(Q) = 1 + \sum_{j \neq i} \mathbb{I}(Q_j > Q_i), \quad T_Q(k) = \{i : r_i(Q) \leq k\}. \quad (2)$$

The four chosen cutoffs ($k = 10, 20, 30, 40$) have exactly k members under each rule in these data. We report the rank shift $L_i = r_i(B) - r_i(R)$ and the shortlist displacement

$$D_k = 1 - \frac{|T_R(k) \cap T_B(k)|}{k}. \quad (3)$$

Thus D_k is the fraction of rules-led candidates replaced by a minimum-led shortlist of the same capacity, not a prediction error. We also compare M with B by Spearman rank correlation and top-20 overlap. To audit the mean's dependence on each pillar p , we form $M_{i,-p} = \frac{1}{2} \sum_{q \neq p} x_{iq}$, then recompute its correlation and top-20 overlap against M_i .

For within-economy asymmetry we summarize $R_i - S_i$, $R_i - E_i$, and $E_i - S_i$. Two-sided Wilcoxon signed-rank tests describe directional differences; percentile intervals for the mean differences resample the 101 economy profiles 14,000 times using a fixed random seed. The intervals omit survey-level uncertainty in the original scores. None of these cross-sectional comparisons identifies a causal effect.

4.3 Mechanical Bottleneck Scenario

Let b_i identify the current lowest pillar, breaking any ties in the fixed order R, S, E . A hypothetical δ -point increase in that

pillar alone yields

$$B_i^+(\delta) = \min \left\{ \min(x_{ib_i} + \delta, 100), \min_{q \neq b_i} x_{iq} \right\}, \quad (4)$$

$$\Delta_i(\delta) = B_i^+(\delta) - B_i.$$

We set $\delta = 10$ and recalculate the minimum after the increase; the next-lowest dimension can become binding before all ten points pass through. This exercise isolates the arithmetic of the decision rule. It assigns neither a cost nor a likely reform effect to changing a B-READY score.

5. EMPIRICAL RESULTS

5.1 Pillar Asymmetry

The regulatory mean is 66.32, compared with 60.03 for operational efficiency and 53.97 for public services (Table 1). The within-economy regulation–service difference averages 12.36 points; 94 of 101 economies have a positive difference (Table 2). The signed-rank result is $p < .001$, while the bootstrap interval for the mean is 10.52–14.12. Regulatory scores exceed efficiency by 6.30 points on average, and efficiency exceeds services by 6.06. These are score comparisons, not time-series improvements.

The lowest component is Public Services in 67 economies, Operational Efficiency in 31, and Regulatory Framework in three. Figure 1 plots the paired gaps, average versus minimum, the largest regulatory-to-bottleneck demotions, and the pillar counts in four panels. This distribution matters for business due diligence: a rules-first questionnaire would most often leave service provision for a second examination, even though that provision is the lowest measured dimension in two-thirds of the sample.

The ordering is far from universal, which is why a single correction factor would be misleading. Efficiency is the weakest dimension in Greece, Portugal, Poland, Spain, and the Philip-

pinis, all of which feature prominently in the rank-change audit. For these cases, asking only whether the public-facing service score is acceptable would still miss the measured operating shortfall. Conversely, Canada and New Zealand have regulation as their lowest pillar and improve sharply relative to their regulation-only positions when judged by the minimum, since that lowest score is itself comparatively high. The identity of the constraint matters as much as the size of the average gap.

The average score exceeds the minimum by 8.18 points across economies, with a median gap of 7.73 and a maximum of 19.15. Table 3 identifies the twenty most uneven profiles. The Democratic Republic of Congo's regulatory score is 63.61, but its service score is 26.56; the 19.15-point gap between mean and minimum is the largest. In Montenegro, rules score 75.80 against services at 51.85. These gaps are diagnostics for what to inspect, not estimates of lost revenue.

5.2 Shortlist Stability

A regulation-only top 20 shares 11 economies with the weakest-pillar top 20. Nine candidates change, yielding $D_{20} = .45$ under Equation 3. Across the full sample, Spearman's rank correlation between R and B is .863, and 23 economies move at least 20 positions. Montenegro changes from position 20 to 58, Greece from 2 to 32, and the Philippines from 26 to 59. New Zealand moves in the opposite direction, from 42 to 8, because its regulatory score is itself the minimum but is comparatively balanced with its other scores (Table 4). A rank demotion is a property of the stated business rule, not evidence that a firm's actual entry plan would fail.

The disagreement is most concentrated at the narrowest cutoff (Table 5). Only three of the ten highest-scoring economies under the rules-led screen remain in the bottleneck top ten. The overlap rises to 20 of 30 and 34 of 40. An expansion team with resources for ten market visits would therefore

Table 1. Business environment scores and aggregation exposure across 101 economies

Measure	Mean	Median	Q1	Q3	Minimum	Maximum
Regulatory Framework	66.32	67.32	61.46	73.86	36.04	80.73
Public Services	53.97	57.82	41.12	67.06	15.51	80.22
Operational Efficiency	60.03	59.88	54.19	67.82	35.48	79.25
Equal-weight mean	60.11	61.68	51.97	69.40	32.30	78.24
Weakest pillar	51.93	55.11	41.12	64.10	15.51	75.98
Mean minus weakest	8.18	7.73	4.06	11.58	0.33	19.15

All World Bank pillar scores range from 0 to 100; the last row is the distance between the equal-weight mean and the weakest pillar. The latter is a diagnostic, not an official B-READY indicator.

Table 2. Paired differences across pillars within the same economies

Within-economy contrast	Mean	Median	Positive	Negative	p	Mean 95% interval
Regulation minus service	12.36	11.20	94	7	3.35e-17	[10.52, 14.12]
Regulation minus efficiency	6.30	6.89	75	26	1.82e-10	[4.79, 7.83]
Efficiency minus service	6.06	5.96	67	34	2.55e-06	[3.96, 8.19]

Two-sided Wilcoxon signed-rank p values; percentile intervals resample economies 14,000 times with a fixed seed. Tests describe score differences and do not identify causal effects.

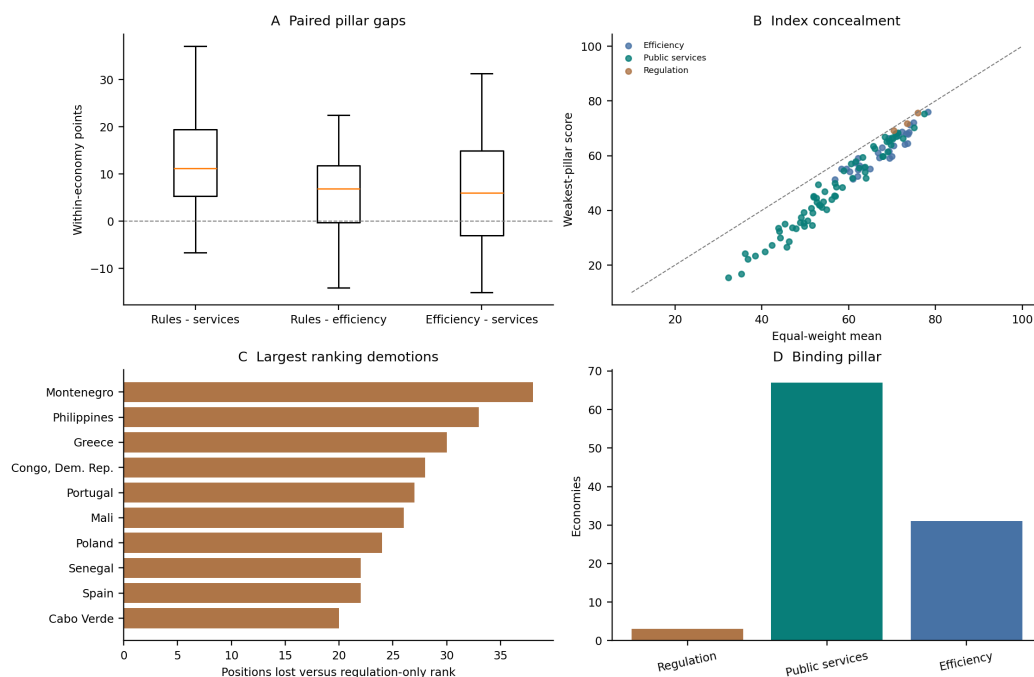


Figure 1. Four views of the three-pillar business environment. Each point and bar is computed from the 101 economies in Table A1.1 of *Business Ready 2025*; panels show descriptive score and rank differences, not firm outcomes.

Table 3. Twenty largest gaps between composite readiness and the weakest pillar

Economy	Rules	Services	Efficiency	Mean	Minimum	Gap	Weakest
Congo, Dem. Rep.	63.61	26.56	46.97	45.71	26.56	19.15	Public services
Equatorial Guinea	44.93	16.84	44.01	35.26	16.84	18.42	Public services
Turkmenistan	50.46	28.60	59.88	46.31	28.60	17.71	Public services
Cabo Verde	63.71	34.54	56.55	51.60	34.54	17.06	Public services
South Sudan	36.04	15.51	45.36	32.30	15.51	16.79	Public services
Congo, Rep.	52.21	24.90	45.03	40.71	24.90	15.81	Public services
Samoa	56.77	34.23	58.31	49.77	34.23	15.54	Public services
Gambia, The	53.97	27.22	45.79	42.33	27.22	15.11	Public services
Chad	51.78	23.40	40.22	38.47	23.40	15.07	Public services
Central African Republic	52.78	22.21	35.48	36.82	22.21	14.61	Public services
Tajikistan	59.81	40.35	64.62	54.93	40.35	14.58	Public services
Madagascar	60.37	33.40	49.95	47.91	33.40	14.51	Public services
Cameroon	58.75	36.30	56.63	50.56	36.30	14.26	Public services
Mali	65.99	35.40	47.51	49.63	35.40	14.23	Public services
Sierra Leone	56.96	30.00	45.61	44.19	30.00	14.19	Public services
Vanuatu	55.85	33.64	51.40	46.96	33.64	13.32	Public services
Lao PDR	50.88	35.62	60.06	48.85	35.62	13.23	Public services
Eswatini	59.70	41.12	60.79	53.87	41.12	12.75	Public services
Seychelles	58.73	39.09	57.35	51.72	39.09	12.63	Public services
Montenegro	75.80	51.85	64.16	63.94	51.85	12.09	Public services

Sorted by mean-minus-minimum. High gaps mark imbalanced scores, not observed supply-chain losses or measured money costs. Source scores are transcribed from *Business Ready 2025*, Table A1.1.

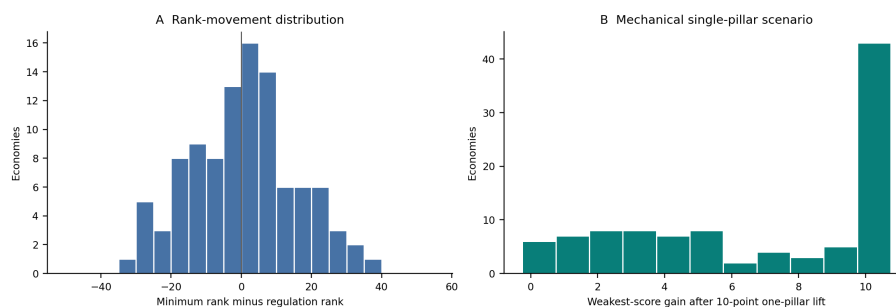


Figure 2. Decision-rule sensitivity and an arithmetic scenario. Panel A shows the distribution of weakest-pillar minus regulation ranks; Panel B shows the increase in the minimum if exactly ten points are added to the current weakest score for each economy, subject to the next-lowest score.

Table 4. Twenty largest changes from regulation-only to weakest-link placement

Economy	Rules	Minimum	Rules rank	Min. rank	Shift	Weakest
Montenegro	75.80	51.85	20	58	+38	Public services
New Zealand	69.22	69.22	42	8	-34	Regulation
Philippines	73.86	51.45	26	59	+33	Efficiency
Greece	79.46	61.64	2	32	+30	Efficiency
Bahrain	67.50	66.89	48	18	-30	Public services
Malaysia	65.61	63.41	59	29	-30	Public services
Congo, Dem. Rep.	63.61	26.56	67	95	+28	Public services
Canada	71.80	71.80	33	5	-28	Regulation
Taiwan, China	69.38	68.03	41	13	-28	Public services
Portugal	77.93	59.74	10	37	+27	Efficiency
Mali	65.99	35.40	58	84	+26	Public services
Türkiye	66.81	62.91	56	30	-26	Efficiency
Tanzania	61.92	55.25	74	49	-25	Efficiency
Poland	79.02	63.63	4	28	+24	Efficiency
Mauritius	64.69	59.48	61	38	-23	Public services
Senegal	67.42	44.00	49	71	+22	Public services
Spain	79.35	64.55	3	25	+22	Efficiency
Bangladesh	53.01	45.14	90	68	-22	Public services
Costa Rica	72.69	55.15	30	50	+20	Efficiency
Cabo Verde	63.71	34.54	66	86	+20	Public services

A positive shift is a drop in position under the weakest-link rule relative to the regulatory score alone. Ranks are among these 101 economies, not official World Bank rankings; ties use the minimum rank.

face a much more consequential modeling choice than a team conducting a broad scan of forty. The weakest-pillar top ten has a median minimum score of 71.53, compared with 66.97 in the regulation top ten; this difference describes the selected sets and is partly mechanical under the criterion used to select them.

The contrast is less dramatic when a committee already uses all three pillars. The equal-weight and minimum ranks have $\rho = .977$; their top-20 sets share 18 economies. Italy and Spain enter the top 20 under the mean only, while Bahrain and Bulgaria enter under the minimum only. Thus the principal instability belongs to the regulatory shortcut, not to all forms of aggregation. Removing one component at a time from the mean retains 20 of its top 20 without regulation, 16 without public services, and 15 without efficiency (Table 6). The latter two dimensions carry distinctive information even when full-sample rank correlations remain high. High correlation by itself is insufficient for a capacity-constrained decision: the identity of a few marginal candidates can matter even if their positions move little across the complete list.

The 101-economy comparison also separates a substantial score disparity from a material shortlist error. The largest mean-minus-minimum gaps in Table 3 occur mainly in economies well outside the regulatory top 20. They are operationally relevant for a firm considering those particular markets, but they do not explain every top-20 replacement. A shortlist can change because a candidate is close to the cutoff, because its weakest pillar is unusually low relative to peers, or because another candidate is balanced despite an unremarkable regulatory score. Table 4 records both directions of movement so that the analysis does not select only

unfavorable cases. In practice, a committee should review the three original scores for every marginal market, rather than treat the rank shift itself as a risk measure.

5.3 Bottleneck Improvement Scenario

Raising the current minimum by ten points increases the new minimum by an average of 6.63 points (median 7.87). Forty-two economies realize the full ten-point change; in 39, the gain is below five points because another pillar becomes the new constraint. Figure 2 shows the resulting distribution. This substitution effect is relevant to a staged audit: once the first service bottleneck is relieved, operating efficiency or regulatory clarity may become the limiting dimension. It is not a claim that a ten-point intervention is feasible or that all three scores use equal resources.

6. DISCUSSION

The results support a particular workflow for cross-market business intelligence. A committee can start with the three source scores and specify minimum tolerances according to its activity: service-dependent logistics, for example, may give a different weight to operational execution than a firm whose main exposure is a license. It can then review economies that enter one shortlist but not the other, and commission local checks on the relevant permits, utilities, registries, and processes. A high R_i with a low S_i calls for investigation of service delivery; a low E_i calls for investigation of how procedures work in practice. The analysis does not assign sector thresholds or recommend entering any named economy.

Table 5. Shortlist agreement at four due-diligence capacities

Capacity k	Shared	Replaced	Agreement (%)	Median minimum, rules list	Median minimum, bottleneck list
10	3	7	30	66.97	71.53
20	11	9	55	66.47	68.52
30	20	10	67	66.28	67.57
40	34	6	85	65.22	66.42

Equal-size lists are drawn from the same 101-economy cross-section. Replaced equals k minus shared; medians are weakest-pillar scores in each selected set, not financial returns.

Table 6. Component-removal sensitivity of the equal-weight index

Component removed	Rank correlation	Top-20 retained	Top-20 changed
Regulatory Framework	0.987	20	0
Public Services	0.973	16	4
Operational Efficiency	0.977	15	5

Each leave-one-component-out score is the mean of the other two pillars; association compares its rank with the three-pillar mean rank. This is a robustness audit of the constructed average.

This workflow permits a useful division of labor. Analysts can document the shortlist rule and calculate how sensitive it is to a few reasonable alternatives. Commercial specialists can then examine whether the weak national pillar maps to their actual bottleneck, using contract-level service standards, local processing times, and operational interviews. Investment decision makers can compare those findings with cost, demand, and risk estimates. The national scores organize scarce inquiry; they cannot replace a project valuation. If the business tolerates compensation across conditions, the mean may be the more relevant initial summary. If one unavailable process could prevent operations, the minimum offers a conservative screening question.

The interpretation is deliberately bounded. B-READY is a country-level, cross-sectional measurement system covering the economies in its 2025 rollout; it is not a representative sample of all world economies or a panel capable of isolating reform effects. The three pillar scales are intended for comparison within the framework, but a minimum rule imposes a managerial preference for noncompensation. Reported rank changes depend on the candidate universe, ties, and this choice of rule. A project may face city-specific constraints absent from national scores, and no revenue, return, or failure data were joined to the pillars. The bootstrap describes variation over the observed economy profiles, not uncertainty in each official score. These limits are material when a numerical screen enters an investment committee pack.

7. CONCLUSION

This study turns multidimensional business-environment data into a transparent decision-support screen for international expansion. In the 101-economy comparison, a regulation-led top 20 replaces nine candidates selected by the weakest-pillar rule; an equal-weight three-pillar shortlist replaces two. A business intelligence report should therefore show each candidate's three source scores, lowest pillar, aggregation gap, rank movement, and shortlist sensitivity rather than present a single unexplained priority number. These outputs direct

scarce due-diligence resources toward the service or execution condition most likely to require local verification. They do not establish market profitability or an optimal location: investment approval still requires sector-specific process evidence, demand and financial forecasts, and firm-level risk assessment.

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