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Regulatory reform in the Brazilian railway sector and concession valuation – a preliminary assessment

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Summary & Main Preliminary Findings

- In the paper we analyze, from the perspective of a firm that owns a concession, **the potential effects on its value due to possible changes in the Brazilian railway regulation** according to the Logistics Program launched by the Federal Government in 2012.

- The current regulatory model is vertically-integrated while the new model would provide unbundling and a new role for the state-owned company VALEC, which would act as a kind of intermediary, buying the whole capacity from infrastructure owners and offering it publicly to independent operators, assuring rights of way for trains throughout the railway.

- At the same time we try to understand the relationship among the stakeholders involved if changes in the regulatory framework occur - firms, the government and final consumers, and who would benefit from such changes.

- **Our preliminary results indicate that the "new" model may damage both concessionaires, which shall have diminished the firm value, and the State/government, which shall bear major fiscal costs.**

Overview of the Rail Sector and its role for Brazilian growth

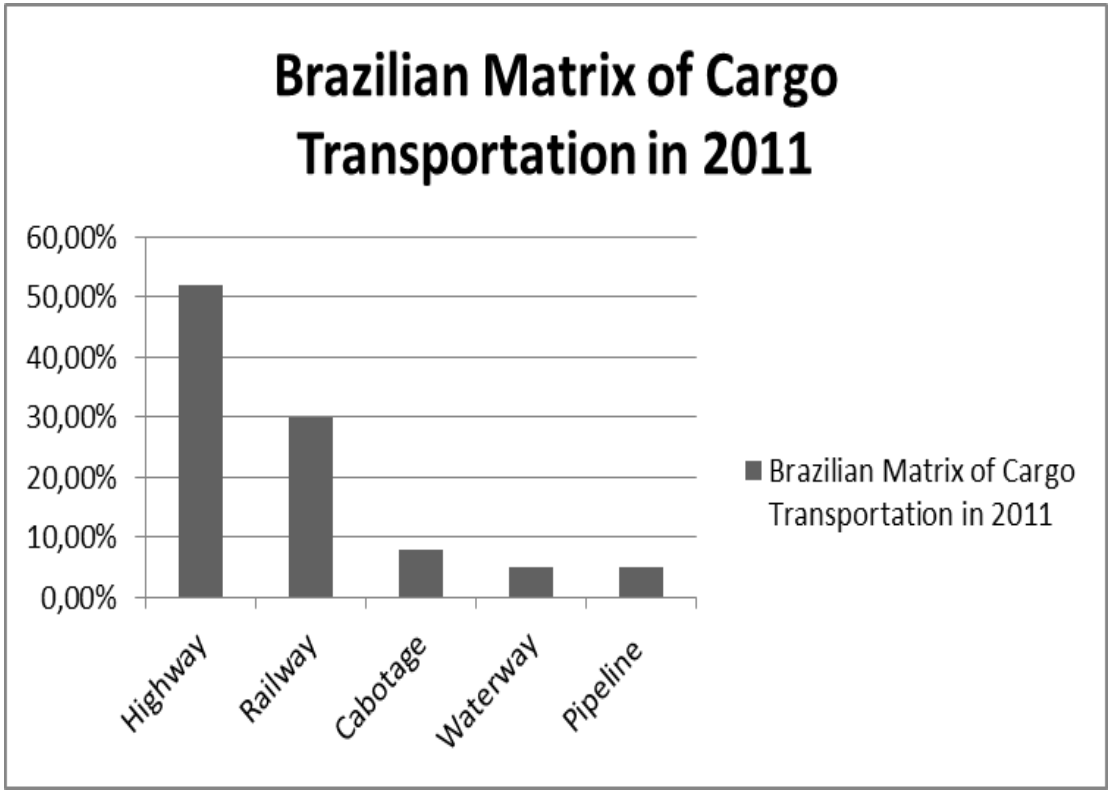
Brazilian GDP has great dependence on primary commodities exportations; this cargo should be captive of railways

Main Exported Products Exported in 2014 (US$ Million)

Products	Value	Δ % (2014/13)	% Share
Soybeans and prods	31,408	1.4	14.0
Ores	28,402	-19.0	12.6
Oil and fuel	25,175	12.4	11.2
Transport material	20,374	-35.5	9.1
Meats	16,891	3.8	7.5
Chemicals	15,051	2.8	6.7
Metallurgic products	14,423	8.8	6.4
Sugar & ethanol	10,357	-24.5	4.6
Machines and equipment	8,671	-3.4	3.9
Paper & pulp	7,218	0.9	3.2
Coffee	6,616	26.1	2.9
Footwear & leather	4,287	10.8	1.9
Electrical equipment	3,965	-7.5	1.8
Precious metals and stones	2,817	-12.1	1.3
Textiles	2,536	7.1	1.1

However, to date the railroad system has a small stake when compared to other means of transportation

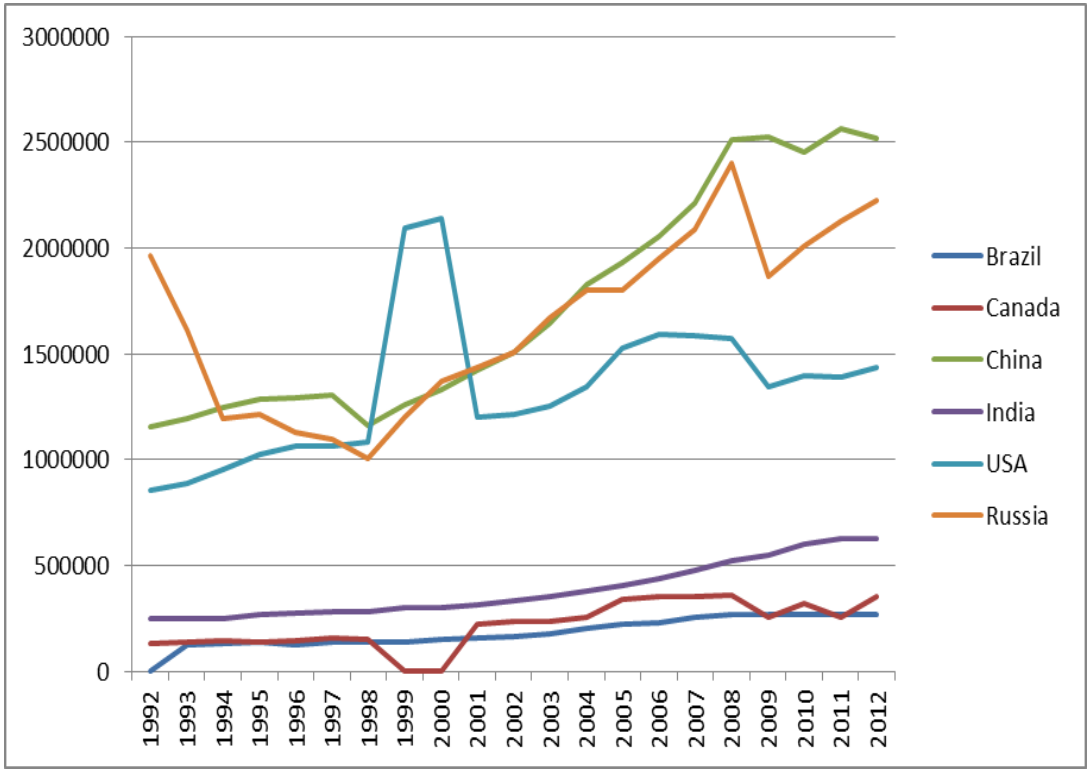
In the **Logistics** Performance Index – LPI 2014 (WB), Brazil stands in the **65th position** among 160 countries analyzed. When it comes to **infrastructure** in general, whereas in 2012 the country was ranked in the 46th position, it dropped to the **54th** in 2014.



Source: PNLT (2012)

Overview of the Rail Sector and its role for the Brazilian growth

Graphic 3 - Railways, goods transported (million ton-km)



Besides the unbalanced Matrix of Cargo Transportation …

Brazil also experiences low network density: **3.9m per km²**.

Brazilian Railway System & the Economy

- ✓ **Until the 80s** - State-investor model.
- ✓ **90s** - privatization program under which the existing railways were divided in different geographic areas and had the exploitation of both infrastructure and services transferred to private companies under concession contracts preceded of public procurement processes.
- ✓ Consortiums have at least one party that is a client of the railroad (Venckovsky, 2005).
- ✓ The national regulatory agency was only set up (2001) after privatization of the railways had taken place (1996-1998).
- ✓ After almost two decades, there is **great evidence that privatization succeeded** in **increasing transportation capacity** in existing railways and significantly **reducing accidents**.
- ✓ However, there was little net expansion.

Brazilian Railway System & the Economy

- **2012** - Launching of the **National Integration Logistics Program (PIL)**, which aimed to boost investments in the railway system by means of **several changes in the regulatory framework**, such as:

i. Unbundling infrastructure and service provision;

ii. Assigning to private parties the duties of construction and operation of new railways under concession agreements/public-private partnerships;

iii. Introducing the figure of Independent Railway Operators, which shall compete for freight clients; and

iv. Having the federal government, through a state-owned company, to purchase all transportation capacity from infrastructure concessionaires and to resell it in the market under public auctions.

- **2015** – Due to regulatory uncertainty and fiscal constraints, it is possible that the **"new model"** will not be implemented. Probability new concessions will be auctioned under the **"old" vertically-integrated model.**

Our Simulations / Case Study

- In order to assess the possible consequences of changes in the regulatory framework to private firms, **we have performed an exercise that calculates the present value (PV)**

(i) Of an existing railway belonging to a real concessionaire today (**Scenario 1**);

(ii) In case the concessionaire becomes an infrastructure provider for VALEC and, through the same economic group, remains as operator (**Scenario 2**); or

(iii) In case the regulatory framework decides to set open access as a general rule without the intermediation of VALEC, allowing competition to be introduced in the railway (**Scenario 3**).

- **Scenario 2 corresponds to the project valuation under the "new model".**

- We are assuming, to make comparisons reasonable, that **railway O&M will remain with the firm (infrastructure provider) as well as services operations – the latter, however, through a new firm belonging to the same economic group.**

- For coming versions of this paper, **we shall perform simulations considering total unbundling and the situation faced by a new concession/project**.

Our Simulations / Case Study

- Case Study based on **"Malha Norte"**, a vertically-integrated railway concession of América Latina Logística (ALL), the largest company in the Brazilian railway sector (publicly traded).

- Model uses **Discounted Cash Flow Method** (**DCF**) and **sensitivity analysis** to evaluate the **Present Value (PV)** of "Malha Norte" under the three scenarios described.

- Scenarios comprise **different assumptions regarding transportation volume, prices, fixed and variables costs**. These assumptions have direct relationship with the underlying situation.

- Revenues dependent on "**pure rail products**", "**agricultural commodities**" and "**intermodal products**".

- Discounted Cash Flow Method is based on **Free Cash Flow to the Firm Model (FCFF)**, combined with **WACC /CAPM** (Weighted Average Cost of Capital / Capital Asset Pricing Model) approach for discount rate estimation.

Main Results

Vertically- Integrated x "Valec" Model

Joint Sensitivity Analysis – Volume Growth x Prices – Scenario 1
Valuation under "old" Vertically- Integrated model

Volume\Tariff	-1,0%	-0,8%	-0,6%	-0,4%	-0,2%	0,0%	0,2%	0,4%	0,6%	0,8%	1,0%
-3,1%	-12.110	-11.505	-10.869	-10.202	-9.501	-8.764	-7.988	-7.171	-6.309	-5.399	-4.439
-2,1%	-9.840	-9.051	-8.220	-7.343	-6.417	-5.439	-4.403	-3.307	-2.145	-912	398
-1,1%	-6.892	-5.843	-4.731	-3.551	-2.299	-969	446	1.953	3.558	5.271	7.100
-0,1%	-2.971	-1.541	-18	1.606	3.340	5.193	7.174	9.295	11.568	14.005	16.622
0,9%	2.379	4.374	6.511	8.802	11.261	13.903	16.743	19.801	23.094	26.645	30.477
1,9%	9.869	12.718	15.786	19.094	22.663	26.517	30.682	35.189	40.068	45.356	51.091
2,9%	20.623	24.783	29.286	34.166	39.457	45.199	51.436	58.217	65.594	73.625	82.375
3,9%	36.432	42.631	49.375	56.717	64.716	73.437	82.952	93.342	104.695	117.107	130.686
4,9%	60.175	69.586	79.868	91.111	103.412	116.880	131.634	147.809	165.550	185.020	206.401
5,9%	96.515	111.031	126.955	144.435	163.632	184.729	207.925	233.443	261.528	292.453	326.523
6,9%	153.038	175.738	200.728	228.254	258.586	292.028	328.915	369.618	414.551	464.173	518.993

Joint Sensitivity Analysis – Volume Growth x Prices – Scenario 2
Valuation under "new" model

Volume\Tariff	-75,0%	-70,0%	-65,0%	-60,0%	-55,00%	-50,0%	-45,00%	-40,0%	-35,0%	-30,0%	-25,0%
0,0%	-25.325	-19.005	-12.684	-6.364	-43	6.277	12.598	18.918	25.239	31.559	37.880
20,0%	-24.459	-16.875	-9.290	-1.706	5.879	13.464	21.048	28.633	36.217	43.802	51.387
40,0%	-23.593	-14.745	-5.896	2.953	11.801	20.650	29.499	38.347	47.196	56.045	64.894
60,0%	-22.727	-12.615	-2.502	7.611	17.724	27.837	37.949	48.062	58.175	68.288	78.401
80,0%	-21.861	-10.485	892	12.269	23.646	35.023	46.400	57.777	69.154	80.531	91.908
100,0%	-20.995	-8.354	4.287	16.928	29.569	42.210	54.851	67.492	80.133	92.774	105.415
120,0%	-20.129	-6.224	7.681	21.586	35.491	49.396	63.301	77.206	91.111	105.016	118.921
140,0%	-19.263	-4.094	11.075	26.244	41.413	56.583	71.752	86.921	102.090	117.259	132.428
160,0%	-18.397	-1.964	14.469	30.902	47.336	63.769	80.202	96.636	113.069	129.502	145.935
180,0%	-17.531	166	17.863	35.561	53.258	70.955	88.653	106.350	124.048	141.745	159.442
200,0%	-16.665	2.296	21.258	40.219	59.180	78.142	97.103	116.065	135.026	153.988	172.949

- Considering the role of VALEC as the **sole capacity buyer**, the value estimated for the concession reaches R$ 42,210 million.
- **This result is 42% smaller than the scenario where the firm continues to operate vertically integrated**– so, if regulation changes towards unbundling and with VALEC as intermediary, the firm would be seriously impaired.
- For example, in a situation where **volume doubles and prices drop exactly a half** – implying in the same level of revenues, the concession's value becomes significantly small due to the impacts on variable costs, which are sensitive to the volumes, not revenues.

Main Results

Vertically- Integrated x Open Access

Joint Sensitivity Analysis – Volume Growth x Prices – Scenario 1
Valuation under "old" Vertically- Integrated model

Volume\Tariff	-1,0%	-0,8%	-0,6%	-0,4%	-0,2%	0,0%	0,2%	0,4%	0,6%	0,8%	1,0%
-3,1%	-12.110	-11.505	-10.869	-10.202	-9.501	-8.764	-7.988	-7.171	-6.309	-5.399	-4.439
-2,1%	-9.840	-9.051	-8.220	-7.343	-6.417	-5.439	-4.403	-3.307	-2.145	-912	398
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-0,1%	-2.971	-1.541	-18	1.606	3.340	5.193	7.174	9.295	11.568	14.005	16.622
0,9%	2.379	4.374	6.511	8.802	11.261	13.903	16.743	19.801	23.094	26.645	30.477
1,9%	9.869	12.718	15.786	19.094	22.663	26.517	30.682	35.189	40.068	45.356	51.091
2,9%	20.623	24.783	29.286	34.166	39.457	45.199	51.436	58.217	65.594	73.625	82.375
3,9%	36.432	42.631	49.375	56.717	64.716	73.437	82.952	93.342	104.695	117.107	130.686
4,9%	60.175	69.586	79.868	91.111	103.412	116.880	131.634	147.809	165.550	185.020	206.401
5,9%	96.515	111.031	126.955	144.435	163.632	184.729	207.925	233.443	261.528	292.453	326.523
6,9%	153.038	175.738	200.728	228.254	258.586	292.028	328.915	369.618	414.551	464.173	518.993

Joint Sensitivity Analysis – Volume Growth x Prices – Scenario 3
Valuation under "competition"

Volume\Tariff	-50,0%	-45,0%	-40,0%	-35,0%	-30,0%	-25,0%	-20,0%	-15,0%	-10,0%	-5,00%	0,0%
-50,0%	-11.689	-8.529	-5.369	-2.208	952	4.112	7.272	10.433	13.593	16.753	19.913
-45,0%	-9.893	-6.416	-2.940	536	4.013	7.489	10.965	14.441	17.918	21.394	24.870
-40,0%	-8.096	-4.304	-511	3.281	7.073	10.866	14.658	18.450	22.242	26.035	29.827
-35,0%	-6.299	-2.191	1.917	6.026	10.134	14.242	18.351	22.459	26.567	30.676	34.784
-30,0%	-4.503	-78	4.346	8.770	13.195	17.619	22.043	26.468	30.892	35.316	39.741
-25,0%	-2.706	2.034	6.775	11.515	16.255	20.996	25.736	30.477	35.217	39.957	44.698
-20,0%	-909	4.147	9.203	14.260	19.316	24.373	29.429	34.485	39.542	44.598	49.655
-15,0%	887	6.260	11.632	17.004	22.377	27.749	33.122	38.494	43.867	49.239	54.611
-10,0%	2.684	8.372	14.061	19.749	25.438	31.126	36.815	42.503	48.191	53.880	59.568
-5,0%	4.480	10.485	16.489	22.494	28.498	34.503	40.507	46.512	52.516	58.521	64.525
0,0%	6.277	12.598	18.918	25.239	31.559	37.880	44.200	50.521	56.841	63.162	69.482

- The presence of a **new competitor** will affect more the concession's PV when compared to scenario 2 (VALEC), reaching R$ 29,429 million.
- In some scenarios, **the best decision for the firm is to abandon the concession** – this is the case if a very large competitor enter the market and get a share of 50%,with price war dropping prices in 35%.
- Also, if we experience a **growth lower than expected, which is a very reasonable possibility**, a drop of 40% in price would be enough to turn the concession economically inviable.

Concluding Remarks / Questions

- According to the scenarios and simulations performed, we conclude that, **from the point of view of a private concessionaire**, the **potential change in regulation may lead to a decrease in the concession's PV, being a negative incentive to already-existing entrepreneurs or to newcomers when compared to vertically-integrated schemes**.

- It is clear that, under some specific scenarios, the change may benefit the firm; **however, these scenarios are potentially associated with higher costs to VALEC and, hence, to the Brazilian government**.

- In the paper we emphasize the firm´s point of view. **There are, at least two other visions about regulatory changes involved**: VALEC (government) and final consumers (society). Some **important questions** remain:
  - ✓ Is the unbundling scheme proposed by the new model likely to foster investments in the railway system and lower logistics costs?
  - ✓ Would the current vertically-integrated model coupled with open access rules be capable of reaching the same or better results than the envisaged the new model?

- As **future extensions** to the discounted cash flow model used, we **have Monte-Carlo Simulation and Real Options Approach**, which are methods that capture the effects of less probable scenarios and managerial flexibility, which may be included in concession agreements as risk-sharing mechanisms.

Thank you!

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