

Chain Reaction Research is a collaborative effort of:  
Aidenvironment  
Climate Advisers  
Profundo

1320 19<sup>th</sup> Street NW, Suite 400  
Washington, DC 20036  
United States  
www.chainreactionresearch.com  
info@chainreactionresearch.com

Authors:  
Tim Steinweg, Aidenvironment  
Gerard Rijk, Profundo  
Matt Piotrowski, Climate Advisers

With contributions from:  
Sarah Drost, Aidenvironment  
Marco Tulio Garcia,  
Aidenvironment  
Repórter Brasil

# Carrefour May Face Financial Risks from Deforestation-Linked Beef Sourcing in Brazil

February 2019

Carrefour SA is a multinational food retailer that holds a majority share in Atacadão SA/Carrefour Brasil, the largest retailer in Brazil. Carrefour's size makes it a major buyer of Brazilian beef and may expose it to deforestation risks, as cattle contributes to deforestation in the Brazilian Amazon. This report analyses Carrefour's deforestation risk exposure based on samples collected through store visits. Chain Reaction Research (CRR) visited 48 Carrefour supermarkets in five Brazilian cities, and inspected 480 randomly selected frozen beef products. Data from the product labels establishes supply chain links between Carrefour supermarkets and slaughterhouses located in the Legal Amazon.

## Key Findings

- **Carrefour Brasil, the largest retailer in Brazil, held a 14 percent market share, with 2018 gross sales of USD 15.4 billion.** Carrefour's large presence in the retail sector makes it a major buyer of Brazilian beef. Carrefour's 30 supermarkets within the Legal Amazon may face elevated deforestation risks.
- **Carrefour has committed to eliminating deforestation from its products by 2020.** The scope and implementation of Carrefour's deforestation and beef policy is limited to unprocessed beef products. The policy does not apply to processed or frozen beef products. Carrefour recognizes that tracing and monitoring of indirect suppliers remains a critical challenge. Carrefour does not publish progress reports or a list of its beef suppliers.
- **Thirty-five percent (168 products) of beef products sampled originated from slaughterhouses located within the Legal Amazon.** Eleven products (2.3 percent) were linked to high-risk slaughterhouses operated by JBS, Marfrig Global Foods and Mercúrio Alimentos.
- **CRR found that Carrefour sources more of its beef products from the Legal Amazon (35 percent) than its competitor Cencosud (23 percent). However, Carrefour is linked to significantly less high-risk suppliers (Carrefour: 2.3 percent of all samples, Cencosud: 7 percent).** As Carrefour has a zero-deforestation policy, unlike Cencosud, reputational risks from peer comparison studies are relatively low. However, any failure to meet its 2020 target of deforestation-free beef supply chains could impact Carrefour's reputation.
- **Deforestation-related beef in the supply chain may instigate civil society/consumer campaigns. Such action could adversely affect net revenues.** The value impact may equal to 4 to 10 percent of Carrefour Brasil's market capitalisation. Due to the importance of the Brazilian activities for Carrefour's global operations, this amount translates into 3 to 7 percent of Carrefour SA's market cap. The Norwegian State Pension Fund, Deutsche Bank and BNP Paribas hold small positions in Carrefour and have their own forest policies.

## Carrefour is a leading retailer in Brazil and major buyer of beef

**Carrefour SA is a multinational food retailer with headquarters in France.** Its stores are in France, Spain, Italy, Belgium, Poland, Romania, Brazil, Argentina, China and Taiwan. The company's various services offer fresh produce, local products, consumer goods and non-food products. In addition, the company is involved in banking, insurance, property development and franchise activities. Carrefour operates 12,300 stores globally and generated net revenues of USD 92 billion in 2017 (in 2018, gross revenues, including VAT, were USD 100 billion. Net revenues' numbers are not yet available).

**Carrefour SA holds a majority share in Atacadão SA/Grupo Carrefour Brasil (Carrefour Brasil, CRFB3), the entity that operates the various Carrefour formats in Brazil.** Figure 1 shows the ownership structure of Carrefour Brasil.

**Figure 1: Carrefour Brasil Ownership Structure**

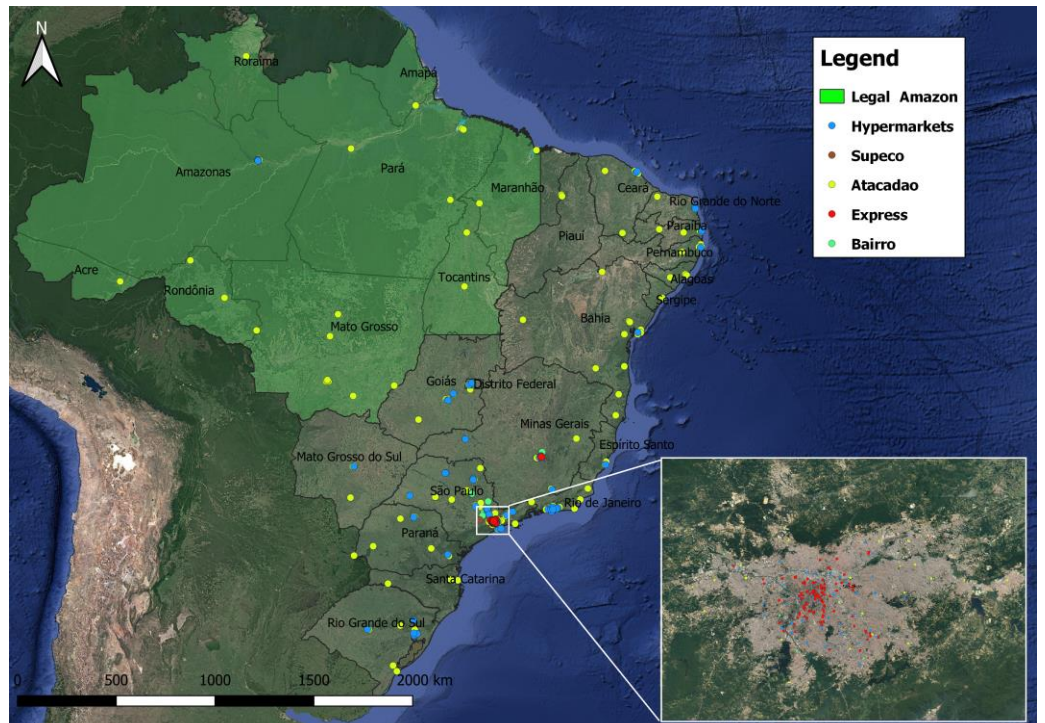
Source: [Carrefour Brasil](#)



**Carrefour Brasil is the largest retailer in Brazil, holding a 14 percent market share in 2017. In 2018, gross sales (including VAT) were USD 15.4 billion.** Carrefour Group opened its first hypermarket in Brazil in 1975. End 2018, Carrefour Brasil had 435 stores in all 27 Federal Units of Brazil (Figure 2). In total, it runs 100 hypermarkets (Carrefour Hypermarket), 49 supermarkets (Carrefour Bairro), 120 convenience stores (Carrefour Express), and 166 wholesale stores (Atacadão).

**Figure 2: Carrefour Stores in Brazil, October 2018**

Source: Chain Reaction Research



\* This figure was drafted on the basis of lists of supermarkets on the websites of the Carrefour store divisions in October 2018. The numbers may slightly differ from the situation at the time of publication or from the totals presented by Carrefour [elsewhere](#).

**Atacadão, the company's Brazilian wholesale store division, is rapidly expanding.** Atacadão gross sales increased 10.2 percent in 2018 due to faster expansion. It opened 20 new store units last year, compared to 10 to 12 previously. The expansion is in line with the Group's 2022 Transformation Plan to accelerate the Atacadão "Cash & Carry" format. Carrefour Brasil plans to invest BRL 1.8 billion (USD 443 million) in store openings in Brazil in 2019.

**Carrefour Brasil, as the largest retailer, is a major buyer of Brazilian beef.** It sells 24,000 tons of unprocessed beef in its Brazilian stores each year. Carrefour Brasil's role in the beef supply chain consists of buying fresh and frozen beef, either from slaughterhouses/meatpackers or from distributors/wholesalers, and then selling to consumers in its stores.

### **Sourcing Beef from the Brazilian Amazon Requires Extra Vigilance**

**Beef products that originate from the Legal Amazon have an elevated risk of being linked to deforestation, as cattle ranching is a major driver of Amazon deforestation.** Carrefour and other retailers may be exposed to deforestation risks through the beef they source from meatpackers that operate slaughterhouses within the Legal Amazon. Supply sheds of these slaughterhouses have seen high rates of deforestation.

**As of 2017, there were 128 active slaughterhouses in the Legal Amazon.** Fifty-five percent of these slaughterhouses are licensed under Federal inspection (SIF), allowing them to sell products across state borders. The remaining 45 percent, under State inspection (SIE), are limited to sell products only within the state of production.

**Forty-nine percent of the Amazon slaughterhouses have signed legally binding Terms of Adjustment of Conduct (TACs) with Brazil's federal government. Through these agreements, they have committed to buying cattle from only ranches free of**

**deforestation since 2009.** The Brazilian Federal Public Prosecution Service (MFP) can carry out sanctions without court intervention against signatories that do not follow TACs. Compared to SIF slaughterhouses, fewer SIE slaughterhouses have signed TACs. While TACs offer a promising instrument for curbing deforestation, signatories may still have to contend with risks associated with deforestation, such as leakage of products from non-TAC signatories.

**Carrefour Brasil has 30 supermarket operations in nine Amazon states (Figure 3).** Carrefour’s presence in the Amazon allows the company to legally source beef from slaughterhouses with SIE and SIF licenses.

State	Atacadão	Carrefour	Total
Amazonas	3	5	8
Mato Grosso	8		8
Pará	4		4
Rondônia	3		3
Maranhão	2		2
Tocantins	2		2
Acre	1		1
Amapá	1		1
Roraima	1		1
<b>Total</b>	<b>25</b>	<b>5</b>	<b>30</b>

**Figure 3: Carrefour Stores in the Legal Amazon**

Source: CRR/Repórter Brasil

### Carrefour has a robust zero-deforestation and beef policy

**Carrefour has committed to eliminating deforestation from its products by 2020.** Carrefour’s Forestry Policy includes Brazilian beef as one of its four key raw materials, in addition to palm oil, soy and pulp and paper. In its Beef Sourcing Policy, the company’s target is to verify that 100 percent of its fresh Brazilian beef sold in Carrefour Brazil complies with five key criteria to prevent farms from producing meat in:

- Deforested areas;
- Areas under an environmental embargo;
- Protected areas;
- Indigenous lands;
- Areas using illegal labour.

Through a geo-referencing tool, developed in partnership with Agrotools, "data provided by beef suppliers will be crossed with public criteria in order to identify any non-compliance with the five criteria that have been introduced."

**Carrefour SA also announced the Act for Food program in 2018**, with nine actionable commitments. By improving food quality, the company seeks to bolster its supply chain transparency. Carrefour’s new plans are particularly important to the beef market in Brazil and will likely build on previous initiatives in the country. Such

initiatives include the USD 1.5 million investment in the sourcing of sustainable beef and the Mato Grosso initiative. This latter program seeks to restore degraded land and protect forests in the Cerrado and Amazon regions of Brazil. A platform is included in which ranchers and farmers can register their sustainable practices to connect with corporate procurement officers and strive to meet zero-deforestation commitments.

**The scope and implementation of Carrefour's deforestation and beef policy is limited to unprocessed beef products. Therefore, it does not apply to processed or frozen beef products. As a result, only about half of Carrefour's beef distribution in Brazil falls under its zero-deforestation policy.**

**Carrefour recognizes that tracing and monitoring of indirect suppliers remains a critical challenge.** Cattle commonly move between various locations during their lifespan before reaching slaughterhouses. Thus, cattle may be raised on recently deforested pastures before moving to a compliant ranch. Meatpackers generally lack effective tracking systems to monitor and control their indirect supply chains. Carrefour has committed to *"supporting additional initiatives aimed at indirect supplier monitoring."*

**Carrefour does not publish progress reports for its deforestation policies, nor does the company publish a list of its beef suppliers.**

### Samples show the origin of frozen beef in Carrefour's stores

In order to assess whether Carrefour's zero deforestation beef policy is adequate to mitigate its exposure to deforestation risks in its beef supply chain, CRR sampled **480 frozen beef products found in Carrefour-operated stores**. Each of these samples contained the name, location and tax identification number of the supplying meat processor (Figure 4).

**Figure 4: Photo of Beef Label with Tax Identification Number (CNPJ), Brand Name, and SIF registration**

Source: Repórter Brasil



Samples were randomly collected during visits to 48 Carrefour-owned supermarkets in November 2018. The sample includes frozen beef products sold in five different Brazilian cities, including Manaus, located within the Legal Amazon. CRR selected supermarkets from states and municipalities with the highest presence of Carrefour stores.

**CRR assessed deforestation risks for each of Carrefour's suppliers based on the following:**

1. Whether the suppliers are located in the Legal Amazon;
2. Whether the suppliers have signed TACs;

3. Whether the suppliers have high risk of deforestation within their cattle supply shed.

The latter is based on a [2017 Imazon study](#) that ranked slaughterhouses' exposure to deforestation risks based on the characteristics of buying zones. The slaughterhouses most exposed to risks had supply sheds that included:

1. Embargoed areas;
2. Recent deforestation;
3. A risk of future deforestation.

### Thirty-five percent of sampled beef products originate from the Legal Amazon

**Thirty-five percent (168 products) of the beef samples originated from slaughterhouses located within the Legal Amazon.** Carrefour supermarkets in Manaus (80 products), Rio de Janeiro (40 products), and Brasília (33 products) sourced the most from Legal Amazon slaughterhouses (Figure 5). Fewer products from the Legal Amazon were found in Carrefour supermarkets in São Paulo (13 products) and Belo Horizonte (two products).

**Figure 5: Carrefour Stores with Highest Number of Amazonian Beef Products**

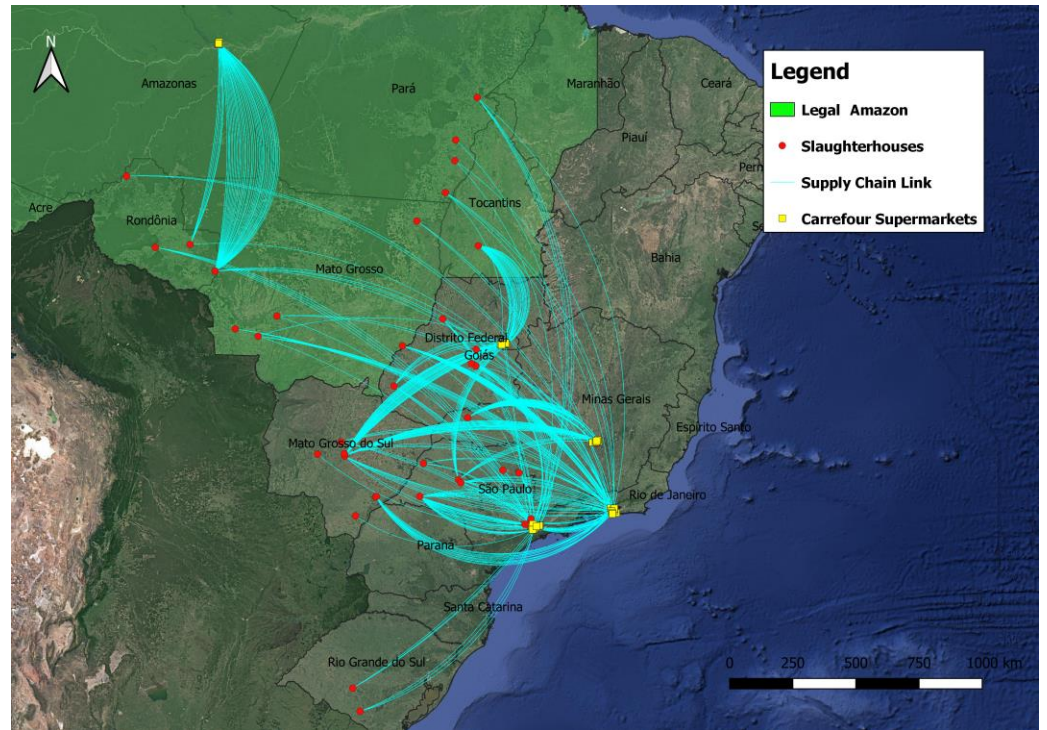
Source: CRR/Repórter Brasil

States	Cities	Total samples	Samples from Legal Amazon
Amazon	Manaus	80	80
Rio de Janeiro	Rio de Janeiro	100	40
Federal District	Brasília	100	33
São Paulo	São Paulo	100	13
Minas Gerais	Belo Horizonte	100	2
<b>Total</b>		<b>480</b>	<b>168</b>

Figure 6 visualizes the supply chain linkages of Brazilian slaughterhouses and Carrefour supermarkets identified through the analysis of 480 Carrefour beef products.

**Figure 6: Locations of Slaughterhouses Supplying to Carrefour**

Source: CRR/Repórter Brasil



**Eleven products link Carrefour with three high-risk Amazon slaughterhouses**

Of the total sample of 480 beef products, 11 products (2.3 percent) originated from high-risk slaughterhouses in the Amazon. Carrefour sourced these products from three meatpacking companies: JBS, Marfrig Global Foods, and Mercúrio. The slaughterhouses are all TAC signatories. Sourcing from slaughterhouses with TACs may still carry large risks because deforestation occurs in their supply sheds.

Seven of the products originate from JBS’s high-risk slaughterhouse facility in **Pimenta Bueno (Rondônia)**. JBS, the largest meatpacker in Brazil and a TAC signatory, has the highest deforestation risk of all meatpackers that operate in the Amazon (Figure 7). Imazon ranked JBS’s slaughter facility in Pimenta Bueno "high" on exposure to deforestation risk, as more than 600,000 ha of its buying zone included embargoed areas, recent deforestation or areas at risk of future deforestation.

**Figure 7: Number of samples products from JBS Facilities**

Source: CRR

Supermarket Store	Very high risk	High risk	Medium risk	Low risk	Very low risk	Total
Carrefour		7	10	25		42
Atacadão			1	32	21	54
<b>Total</b>		<b>7</b>	<b>11</b>	<b>57</b>	<b>21</b>	<b>96</b>

Three other beef products are linked to Marfrig Global Foods’ slaughterhouse in **Mato Grosso (Tangará da Serra)**. In 2012, the State Public Ministry denounced this unit for labor irregularities. The site was also temporarily shut down shortly after the “Carne Fria” (cold meat) operation in 2017. This federal investigation exposed 15

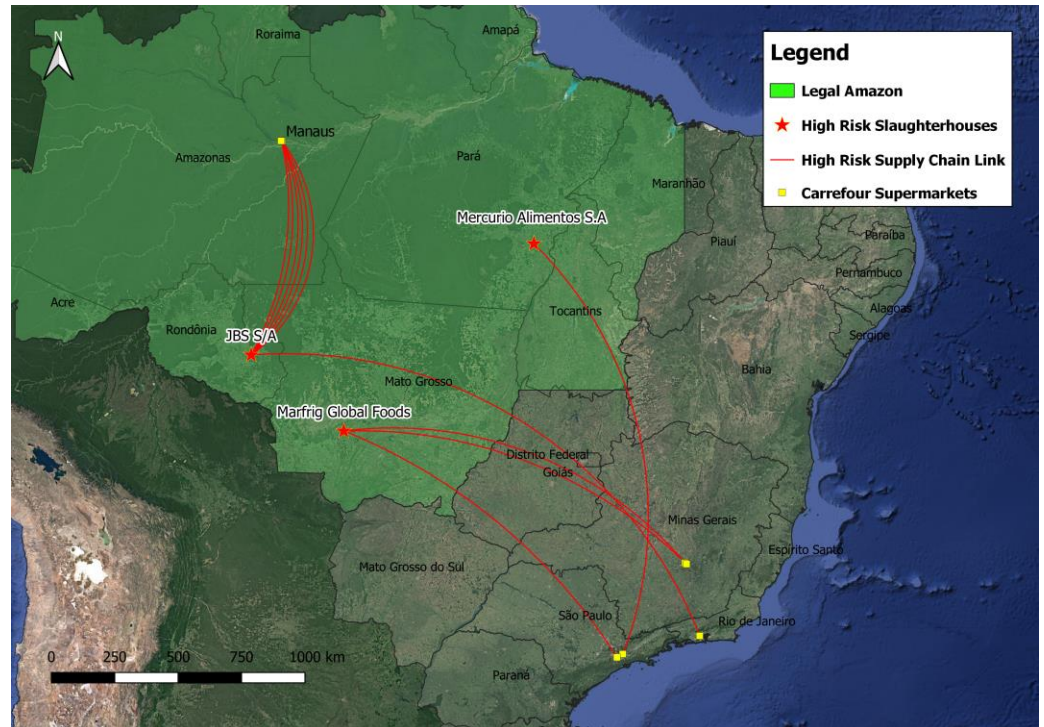
meatpackers and 20 farms that purchased cattle that were grazed on illegally deforested land in Pará.

Finally, one product originates from the **IBAMA fined plant Mercúrio Alimentos S.A in Pará (Xingaura)**. In 2017, **IBAMA**, Brazil's environmental agency, accused Mercúrio's parent company Mafripar of sourcing cattle from embargoed and illegally deforested areas in southwest Pará. Mafripar denied the accusations.

Figure 8 below depicts the locations and supply chain links of these three high-deforestation risk slaughterhouses and Carrefour.

**Figure 8: High Risk Slaughterhouses in the Amazon Supplying to Carrefour**

Source: CRR/Repórter Brasil



### One Low-risk, non-TAC signatory in Carrefour's supply chain

Thirty-one sampled meat products are linked to **Cooperativa dos Produtores de Carne e Derivados de Gurupi** in Tocantins, the only Amazon-based supplier in the sample that did not sign a TAC. All 31 products from this meatpacking plant were found in Carrefour supermarkets in Brasília. Despite not having signed the TAC, this meatpacking plant ranks very low on deforestation risks.

Thirty-seven meat products in Carrefour's stores originated from **JK Distribuidora de Carne Ltda (JK)**, located in Manaus. JK is a distributor that does not operate its own slaughterhouse, and thus represents an intermediary in Carrefour's supply chain. JK's four known suppliers are from Amazonian states Rondônia and Acre. However, they each have a low deforestation risk profile. The products linked to this distributor are therefore considered to have limited impact on deforestation. JK's sourcing manager told CRR that Carrefour does not require its suppliers to have a TAC, and only asks for SIF registration.



## Carrefour may be exposed to reputational risks for any link to high-risk slaughterhouses

In CRR's findings, Carrefour sourced more of its beef products from the Legal Amazon (35 percent) than its competitor Cencosud (23 percent). CRR researched Cencosud in a separate report published in October of last year. Despite the higher percentage of sourcing from the Legal Amazon, Carrefour is linked to significantly less high-risk suppliers (2.3 percent of all samples) than Cencosud (7 percent). As such, Carrefour's exposure to deforestation risks in its beef supply chain appears less pronounced than Cencosud's exposure. As Carrefour has a zero-deforestation policy unlike Cencosud, reputational risks from peer comparison studies are relatively low.

However, any failure to meet its 2020 target of deforestation-free beef supply chains could impact Carrefour's reputation. Its beef purchases could heighten reputational risks should Carrefour be exposed to deforestation in its supply chain. In that context, the three high-risk suppliers identified in this report may jeopardize Carrefour's business relations with clients and consumers.

### Financial Risk Analysis

In this section we analyse the potential financial consequences of the deforestation-related beef in the supply chain of Carrefour Brasil. This analysis focuses on both the Brazilian unit which has a listing in Brazil, and Carrefour SA which has a listing in Paris (France).

The risks for Carrefour Brasil and Carrefour SA can be distinguished as follows:

- Reputation and market access risk
- Financing risks

### Carrefour Brasil: Important to Carrefour SA's financials

In total net revenues, the Brazilian operations total 17 percent to Carrefour's 2017 global revenues (Figure 9). In EBITDA and net profit (before minority deductions), the percentage of contributions from Brazil were even higher at, respectively, 29 percent and 70 percent. In 2018 the net profit contribution is estimated at 51 percent. These calculations abstract from third party contributions.

Moreover, in market capitalization terms, Brazilian activities are relatively important in the global Carrefour SA context. The Brazilian unit's market capitalization is worth more than 50 percent of Carrefour's global market capitalization.

	2015	2016	2017	2018F	2019F
Net revenue	14.3%	15.6%	17.1%	16.5%	18.0%
Gross profit	12.0%	13.3%	15.1%	16.6%	18.0%
EBITDA	19.1%	22.1%	28.9%	25.6%	27.3%
Net profit	18.5%	30.1%	69.6%	51.0%	49.1%
Enterprise Value			36.2%	35.3%	
Market cap			54.3%	68.1%	

Figure 9: Carrefour Brasil as percentage of Carrefour SA for key financial indicators.

Source: Bloomberg 29 January 2019. Note: The calculations abstract from third party contributions

Carrefour Brasil registered growth during the FY2015-17 period. In FY2018, Carrefour Brasil realized a 7.6 percent higher gross turnover in Brazilian Real, mainly due to store openings, but in US Dollar terms it recorded a decline. Revenues and profits are forecasted to recover in FY2019 (Bloomberg consensus estimates; Figure 10) following a recovery in the economy and the Brazilian real.

**Figure 10: Key financials  
Carrefour Brasil**

Source: Bloomberg 29 January 2019

USD million	2015	2016	2017	2018F	2019F
Net revenue	12,626	13,727	15,753	14,435	16,076
Gross profit	2,474	2,744	3,214	2,906	3,218
EBITDA	851	980	1,250	1,015	1,176
Net profit	233	367	543	435	512
Net debt	495	173	-786	-394	-433
Net debt/EBITDA (X)	0.6	0.2	-0.6	-0.4	-0.4
Enterprise Value			8,635	11,125	
Market cap			9,121	10,671	

### Reputational risk has financial impact on Carrefour Brasil, Carrefour SA

**Carrefour Brasil may face reputational risks and could lose customers and market share. As a result, Carrefour SA may feel repercussions.** If Carrefour Brasil becomes subject of civil society/consumer campaigns related to sourcing beef from deforested Amazon areas, the company may suffer reputation damage, at least in the short run. For instance, losing two to five percent of its customers in its Brazilian supermarkets would lead to the following impact on Carrefour Brasil:

- USD 315 to 788 million revenue-at-risk, using the FY2017 as the base revenue;
- USD 64 to 161 million loss of gross profit, assuming the company's gross margin will stay at 20 percent, the average gross margin over the last five years;
- USD 450 to 1,125 million in a discounted cash flow calculation, which equals four to 11 percent of Carrefour Brasil's current enterprise value (Figure 11) and four to 11 percent of its market capitalization.

**Figure 11: Scenarios of financial impact on Grupo Carrefour Brasil if net revenues decline by 2/5%**

Source: Chain Reaction Research. Note: Last two lines in the table: Impact on EV and Market Cap of global Carrefour

	2%	5%
Net revenue impact (USD m)	315	788
Gross margin (%)	20.4%	20.4%
Gross profit impact (USD m)	64	161
Multiplier (x) based on WACC 10%	7	7
DCF value (USD m)	450	1,125
As % of		

Enterprise Value Carrefour Brasil	4.0%	10.1%
Market Cap Carrefour Brasil	4.2%	10.5%
Enterprise Value Carrefour SA/France	1.4%	3.6%
Market Cap Carrefour SA/France	2.9%	7.2%

Given that its Brazilian supermarkets and cash & carry stores are important to Carrefour SA, the French entity could also see financial impacts (see Figure 11, last two lines). If Groupe Carrefour Brasil's reputation value is adversely impacted, there would be a ripple effect felt by Carrefour SA. The value impact for Carrefour SA's Enterprise Value and Market Cap would be in the range of respectively one to four percent and three to seven percent.

### Financing risk is low with lack of financiers with zero-deforestation policies

**Carrefour SA holds 72 percent of the shares of Carrefour Brasil. Remaining shares are held by Peninsula and other investors through the stock market (Figure 12).**

The Brazilian tycoon Abilio Diniz has stakes of 8.9 percent and 7.6 percent, respectively, in Carrefour Brasil and Carrefour SA. In Carrefour Brasil, Norges Bank Government Pension Fund holds a 0.4 percent equity stake. Norges Bank has a policy of avoiding deforestation in its investment activities. HSBC, which has an NDPE policy only for palm oil, has a 0.1 percent stake in Carrefour Brasil.

Shareholder	Country	% of shares
Carrefour SA	France	71.7%
Peninsula FIP (Abilio Diniz)	Brazil	8.9%
Oppenheimer Funds	USA	5.4%
BlackRock	USA	1.1%
Vanguard Group	USA	0.6%
Norges Bank Government Pension Fund Global	Norway	0.4%
Wells Fargo	USA	0.3%
HSBC Holdings	UK	0.1%

**The global entity Carrefour SA carries a high amount of gross debt, mainly in bonds.** Carrefour Brasil has a net cash position in 2017-18, which amounts to USD 394 million at the end of 2018F (Figure 10). By contrast, Carrefour SA/France has a net debt position of USD 4.2 billion in 2018F, and Bloomberg consensus estimates point to USD 3.4 billion by the end of 2019F.

Based on Bloomberg consensus estimates, the net debt/EBITDA ratio of Carrefour SA is forecasted to be 0.79X in 2019F. The ratio has dropped in the last three years from 1.4-1.6X in 2015-2017 (Source: Bloomberg).

**Figure 12: Shareholders of Carrefour Brasil**

Source: Bloomberg 29 January 2019

If Carrefour Brasil's EBITDA is impacted by civil society/consumer campaigns (see scenarios figure 11), Carrefour SA/France could face potential financing risk, given that this unit has a net debt position. However, the impact on the net debt/EBITDA ratio of this unit would likely be minimal. The ratio would increase from 0.79X to 0.81X pro forma 2019E (Figure 13).

USD million	0%	2%	5%
EBITDA 2019 impact	0	-64	-161
Pro forma EBITDA 2019	4,303	4,259	4,162
Net debt	3,386	3,386	3,386
Net debt/EBITDA (x) pro forma	0.79	0.80	0.81

**Figure 13: Impact on Carrefour SA net debt/EBITDA ratio from if Brazilian revenues decline by 2/5%**

Source: Chain Reaction Research

Of the bondholders, Deutsche Bank and BNP Paribas have ESG policies on cattle.

- Deutsche Bank (USD 114 million bonds in Carrefour) says it is committed to stop deforestation. It has signed the New York Declaration on Forests and the Soft Commodities Compact.
- BNP Paribas also has endorsed the Soft Commodities Compact, a joint initiative overseen by the Consumer Goods Forum, and the Banking Environment Initiative. The Initiative's signatories aim to eliminate deforestation from downstream and upstream supply chains no later than 2020. BNP Paribas has purchased USD 44 million in bonds.

	Country	USD amount
Itau	Brazil	267
Allianz SE	Germany	232
Credit Agricole Group	France	142
Grupo Banco do Brasil	Brazil	134
BlackRock	USA	133
Union Investment Lux	Lux	115
Deutsche Bank	Germany	114
Dekabank	Germany	106
BNP Paribas	France	44

**Figure 14: Bondholders of Carrefour SA and Grupo Carrefour Brasil**

Source: Bloomberg 29 January 2019

When combining shareholders and bond/debt holders, only a small percentage of the total financing has ESG policies on deforestation. In combination with the net debt/EBITDA ratio, which is relatively low (at Carrefour SA and even negative for Carrefour Brasil), the WACC (weighted average cost of capital) will not likely be affected materially if investors reduce their holdings.

**Disclaimer:**

This report and the information therein is derived from selected public sources. Chain Reaction Research is an unincorporated project of Climate Advisers, Profundo, and Aidenvironment (individually and together, the "Sponsors"). The Sponsors believe the information in this report comes from reliable sources, but they do not guarantee the accuracy or completeness of this information, which is subject to change without notice, and nothing in this document shall be construed as such a guarantee. The statements reflect the current judgment of the authors of the relevant articles or features, and do not necessarily reflect the opinion of the Sponsors. The Sponsors disclaim any liability, joint or severable, arising from use of this document and its contents. Nothing herein shall constitute or be construed as an offering of financial instruments or as investment advice or recommendations by the Sponsors of an investment or other strategy (e.g., whether or not to "buy", "sell", or "hold" an investment). Employees of the Sponsors may hold positions in the companies, projects or investments covered by this report. No aspect of this report is based on the consideration of an investor or potential investor's individual circumstances. You should determine on your own whether you agree with the content of this document and any information or data provided by the Sponsors.