ARGOS

Argos Valuation Model Assumptions

Value added to society VAS

Model assumptions

The scope of this model is the operation of Cementos Argos in Colombia, Central America, and the Caribbean.

Retained benefit

Calculated by subtracting the income tax, interests and dividends paid by the company from the ebitda. This information is available in our financial statements which can be found in out annual integrated report.

Economic externalities

Salaries & benefits, taxes, interests & dividends

Input data: the payments affectively made during the year to our stakeholders: employees, authorities, financial institutions, investors, and shareholders.

Multiplier: the indirect effect, which we define as the increase in demand and consumption in local economy because of liquidity intake. This effect consists of:

- *GVA (gross value added):* The percentage of initial expenses that are injected into different sector of the economy through the increase of stakeholder consumption and expenditure. The GVA are taken from the OECD's input-output tables.
- *Backward linkages:* the sector's capacity to directly affect other sector through the demand of intermediate consumption of goods.

We take de OECD's input-output tables based on the input-output analysis developed by W.W. Leontief as an interpretation instrument of the interdependencies betweent diverse economic sectors.

Assumptions: We initially calculate the monetization of the economic externalities assuming the local economies are fully efficient with regards to resource and economic impact distribution. Afterwards, we apply a correction for economic inefficiencies to consider external activities related to corruption in the country where we operate and in which we do not participate. We calculate this correction for every country using Transparency International's Corruption Perception Index which reflects the way in which external conditions may affect the company's social value generation.

Social externalities

Health & safety in the workplace (H&S)

Input data: the work-related illnesses and accidents (serious, moderate and fatalities) of our employees.

Multiplier: the social cost of lesions and fatalities according to the Safe Work Australia Study (2015), which estimates the average costs for the employee and the community including rehabilitation expenses and medical attention, administrative expenses and loss of present and future income.

Assumptions: Given that the monetization factors are expressed in 2013 Australian dollars (AUD), we make an exchange rate end GDP adjustments so that they reflect the total costs in each of our regionals. We do not consider the costs that illnesses and accidents represent to the company because we assume these are already reflected in our financial statements.

Talent development

Input data: the number of employees that leave the company and the training hours in the period.

Multiplier: the social return on investment of education for determined training levels.

Assumptions: we monetize using the annual rotation rate and the average training hours of our employees. The effects of talent development become an externality once the employees leave the company and obtain better income in the labor market because of a higher qualification. This approach allows us to monetize these effects as the impacts on the local economy generated by the additional income that the employee receives once she or he gets a new job. Training of employees that remain in the organization translated into higher productivity and efficiency and therefor, its effects are already internalized in our financial statements.

Community investment

Input data: the value of investments made in the following investment lines: housing, community infrastructure, education infrastructure, scholarships, sponsorships and investments in quality education.

Multiplier: the social return on investment (SROI). The details of the SROI's used for each investment lines are the following:
-*Housing:* for Colombia and Central America and the Caribbean we selected an average of our four multipliers from different studies.
-*Community and education infrastructure:* for Colombia we chose Clavijo, et.al. (2014) as a reference.; for the Central America and the Caribbean we took the average multipliers from Brazil, Mexico and Argentina published by Standard & Poors (2015).
-*Scolarships:* we use the return on investment for education from the OECD (2017). For Colombia and Central America and the we used the multiplier for Chile.

Assumptions: we use the SROI to calculate the benefits to the community of a specific project in a determined locality for every invested monetary unit. We apply a specific SROI to each region or country where we operate, we select the closest methodological references, or we make approximations aimed at adjusting to the local reality.

Environmental externalities

GHG emissions

Input data: the gross tones of CO2 emissions scope 1 and 2.

Multiplier: the social cost of carbon (SCC) which reflects the damage to society generated by GHG emissions. We use the estimates from the US environmental protection agency EPA.

Assumptions: each year we include inflations adjustments and a 4% discount rat, which we apply in accordance with the options provided by the source study. Nevertheless, the estimations vary according to the discount rate applied, which determines the current value of future damages. This cost includes affectations to agricultural net productivity, human health, the material damages from the increase of flooding risks and the value of the ecosystemic services lost from climate change.

Atmospheric emissions

Input data: mercury (Hg), sulfur oxide (Sox), nitrogen oxide (NOx) and particulate matter (PM) emissions.

Multiplier: the social cost of atmospheric emissions from TruCost (20139 and the European environmental agency (2009)

Assumptions: this cost includes the impact on human health (approximately 90% of the total cost), the forest and agricultural yields, material corrosion and water acidification.

Because of data availability, we calculate the negative impact of particulate matter emissions (PM) using the cost of PM10 (relates to the particulate size), while the impact of sulfur oxide emissions (Sox) come from SO2. The impact of atmospheric emissions depends on the population density of the areas we operate. Therefore, we use as an assumption the average cost of atmospheric pollutants in the study. Currently the mercury emissions input data scope covers 90% of our operations.

Water

Input data: water consumption and its location due to stress levels, from all out operations, which includes non-consumptive direct use and indirect use (values of recreation, biodiversity, recharge of subterranean waters, waste assimilation)

Multiplier: the social cost that water consumption generates in a specific location according to the Natural Capital at Risk study by TruCost (2013).

Assumptions: this approach assumes that the social cost derived from the use of water varies depending on the level of stress in a determined locations. Therefore, we classify the water sources for our operations by water stress risk, which is defines by the WRI Aqueduct Tool as the relation between the total amount of water taken by the industry, agriculture and the domestic sector ad the total available water in determined basin. The higher the level of water stress risk, the higher the social cost of water.

Biodiversity

Input data: total affected and rehabilitated hectares classified by ecosystem type.

Multiplier: the annual estimated benefits of restauration projects in different ecosystems around the world (TEEB, 2009).

Assumptions: we exclude the areas of our concrete plants, since these were stablished on areas that had been previously constructed and therefore, we assume that no additional impact on biodiversity was generated.

Alternative materials and fuels

Input data: tonnes of alternative materials and fuels used and the tonnes of conventional materials and fuels that were not used in production processes.

Multiplier: the social cost of carbon (SCC), the same multiplier for GHG emissions.

Assumptions: given that the alternative materials and fuels used are waste or subproducts we do not include the negative impacts derived from their production.



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