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Dow Chemical By Kai Draaisma Laurens de Blij Diedrik Oost Eva Sloff Lesley Flohil 13-11-2012 Duisenberg School of Finance Executive summary 1.

Summary of Facts. With an annual revenue of \$20. 2 billion Dow held the leading market position worldwide in ethylene and polyethylene (exhibit 1b). To consolidate all of Bahia Blanca's polyethylene activity under Dow's control a three-stage plan was developed. The first stage involved taking control of PBB, the second stage involved acquiring Polisor's two polyethylene plants, and the third stage involved building a new ethylene cracker.

To determine a proper risk premium Dow had to consider possible country risks. Currency and government policy risk may have had an impact because of possible future crises and changing government policies relevant to foreign investments. Furthermore, because of the ending of the convertibility law Dow also had to consider a possible exchange-rate risk. Dow created a holding company, Dow Investment Argentina, to invest in the project, then they had to decide whether they will use general corporate funds or raise debt for the PBB bid.

2. Statement of problem . 1General analysis Rational for Acquisition of PBB Dow Chemical's corporate strategy is to look for horizontal- and vertical integration, achieve technological leadership and gain international presence. Dow will benefit from a more integrated production process by lowering their cost of production. PBB will also create stable supplies of ethane for Dow allowing them to achieve operating rates near 100%. Cracking ethane in the region will result in lower operating risk for Dow meaning the supply/input risk for the production of Polyethylene.

An increase in the production output of Dow will allow them to benefit from economies of scale. Overall Dow will gain technology leadership and operational excellence from adding PBB to their company and enhance them with a cost leader position in the market required to compete with the government-subsidized chemical complexes. Risk measurement In this section we provide a brief risk analysis. Table 1 is designed to give a compact overview of the different risks, possible mitigating actions and whether the risks are integrated in the cash flow or discount rate.

Not every risk was applicable in the acquisition of PBB. The risk that influenced our cash flows the most is the currency risk caused by a possible liquidity crisis in Argentina. Argentina has experienced eight major currency crises (tijd/reference) and there is a risk of a new currency crisis in the future. When this happens, Dow will not be able to sell its output to the home country and will have to increase its export. Revenue de We have also taken into account that the convertibility law that now provides stability could eventually stop. This will also have a significant impact on inflation.

Operating risk is the second risk with a large impact on projected cash flows. This is mostly the risk of not meeting the full operating capacity. For the first 3 years we keep the operating rate of the plant at 65% and from 1995 we increase the operating rate by 5% each year. Other risks had less of an impact on our cash flows. Information risk was less of an issue because Dow was already present in Argentina and PBB was important to the government of Argentina. Corporate Governance risk in Argentina is not expected to have a significant additional impact on cash flows.

This risk is already included in the discount rate for similar projects in the US.

Table 1: Risk overview| Risk| Mitigating actions| Cash Flow (CF) or Discount rate (DR)| Corruption risk| 1. Have a large bank loan from a national bank. 2. Government stake of 49% here is a mitigating factor | DR| Expropriation risk| Same actions as for corruption risk| CF (tax wil increase 5%)| Operating risk (only post/ completion risks)| n/a| CF| Sovereign risk| Through the convertibility law, the peso has been anchored to the USD to prevent hyperinflation. | DR| Currency/ Foreign exchange risk| 1.

Dow is a well diversified investor, therefore this should be mitigated. 2. Buy put options on the Arg peso. | CF| Corporate Governance risk| Give shares to management to align incentives. | DR| Repatriation risk| Current political climate is stable, not likely that Arg will impose limits on fund outflows. | DR| Information Risk| Dow Chemical already has presence in Argentina, therefore are more likely to receive high quality information. | n/a| Adjusted discount rate All risks that are not used for adjusting cash flows are integrated in the adjusted discount rate.

These risks include but are not limited to corruption risk, information risk, hyperinflation, sovereign risk, repatriation risk and other residual risks. These risks are partly mitigated, however all the different risks combined constitute a premium which we will add on to the the given discount rate for similar projects in the US of 8%-10%. A reasonable assumption for the combined premium will be []. The auumed premium results in a discount rate of [] which we will use in our further valuation. 4. Recommendation Bidding decision

Competing bidders need to comply with certain covenants (exhibit 6). Competitors Perez Companc S. A. and Copesul do not comply with the requirements of having a statement of net worth of at least 5 billion. Even if the two companies would merge they do not meet the requirements. This makes Dow the sole bidder for PBB. This has a profound impact on the internal valuation. Appendix 1 Risk Information risk. When you are doing a cross-border valuation you have to take into account that there may be information risk.

This includes the risk of outside investors getting the wrong information because of poor disclosure in the financial statements. However since Dow entered Argentina in 1957 we assume they are familiar with the market and accounting rules, therefore information risk for this project is low as Dow chemical has already collected country experience in Argentina via Dow Quimica. Because this is difficult to quantify we have taken this into account in our discount rate. Corruption risk. The risk of corruption includes the illegal payments and favors outside the rule of law.

Corruption exists to some extent in all countries, but there are large differences across countries. According to the Global Corruption Index by Transparency international, the level of corruption for Argentina in 1995 was given a 5.24 out of a possible score of 10. This gave them a ranking of 24 out of 42 countries surveyed. All of which were assumed to be developed countries. However, Dow somehow secured itself thanks to PBB's importance and the Argentine government's intention to keep 49% which is an advantage and not a disadvantage.

The Argentine government will also appreciate the jobs being created in the later project stages, if successful, and a good relationship with the government will likely also be beneficial when discussing with YPF about long-term ethane supply. Mitigation: Part of this risk can be mitigated by taking a loan in Argentina to finance the project as the government will not want Dow to default on their debt resulting in an overall bad outcome for Argentina's economic situation. Furthermore part of this risk is mitigated as the government has a stake in the company so it is also in their interest to keep the company strong.

Currency risk: As Argentina has experienced 8 major currency crises in the past there is the risk of a new currency crisis occurring in the future. Even though the convertibility law took away some of the risk, Dow will still have to bear in mind that when a crisis happens, they will not be able to sell their output to the home country and will have to increase its export. This risk is taken into account in the cashflows. Expropriation risk. Political instability or expropriation is small as the company has had a stable democratic government past 12 years.

However, changes in the policy of the government will cause a risk for Dow and their foreign investments. At that moment there were no restrictions on borrowing abroad and there were no limits imposed on payments of foreign loan principal and interest. If something changes in this regulations it may have an effect on the acquisition of Dow. For this reason we will also include this risk in our discount rate. Furthermore the government has no limits on cash flows going out of their country but can eventually decide to do so.

We consider the risk of the government taking over the company to be low as the production of polyethylene and deriving ethylene from hydrocarbon crackers is complex. This is a process for skilled people and not just anyone can therefore run the company properly. The risk of expropriation is therefore low. As the production of ethylene and derivatives such as polyethylene is a highly complicated process, requiring large capital investment and a high operating leverage, not many companies will be able and willing to take over the business.

Furthermore as Polyethylene is a commodity product that trades globally with a narrow price range. Mitigation: Dow can decrease the risk exposure by taking on a loan in Argentina to finance their project. This will decrease the risk exposure as Dow can only default on their debt when the government decides to raise taxes, which will not lead to a company default. Foreign Exchange Rate Risk. Foreign Exchange rate risk will be low because of Dow Chemical's international presence and the assumption that shareholders are sufficiently diversified. The convertibility law which ensured a fixed Argentine peso and U.

S. dollar at exactly one already decrease the foreign exchange rate risk. However we need to take into account the risk that the convertibility law might come to an end. Mitigation: The risk can be decreased by setting up binding financial contracts with the government to make sure the deal will happen. Furthermore Dow could decide to place a put option on the peso to protect themselves when the peso collapses. Operating risk Pre-completion:

as the project is already completed there is no risk concerning the technology risks or other completion risk.

Post-completion: we have included the post-completion risk in our cashflows as we run the risk of not meeting the full operating capacity. For the first 3 years we keep the operating rate of the plant at 65% and from 1995 we increase the operating rate by 5% each year. As the company provides their own input this risk does not need to be taken into account. Operating risk would likely matter but we handled that risk by adjusting down our cashflows in stage 1 so we do not take it into account for adjusting our cost of capital

Sovereign risk Political events such as wars, labor strikes, terrorism and changes in laws can happen in any country you work with and therefore needs to be taken into account. Since it is hard to quantify this risk we have handled it through the discount rate. Appendix 2 | | Source: Erb, Harvey Viskanta, ' Political risk, Economic risk and Financial risk', Fuqua School of Business Working Paper No. 9606, 1996. | ----- [1]. For broader explanation of the different risks see Appendix 1 [2].

According to the Global Corruption Index by Transparency international the level of corruption for Argentina in 1995 was given a 5.24 out of a possible score of 10. This gave them a ranking of 24 out of 42 countries surveyed. All of which were developed countries more or less. Source: http://archive.transparency.org/policy_research/surveys_indices/cpi/previous_cpi [3]. See Appendix 1 for an explanation of the mitigating factors of the before mentioned risks [4]. This conclusion was reached by taking the ' total

assets' as net worth on the financial statements of Perez on Copesul (exhibit 8a &8b).