

# Financial intermediation, lender equity and project finance debt mandates

Lkhagvajav Altansukh, Andrew Ferguson\*,

*University of Technology Sydney*

Luiz Fernando Distadio, *Griffith University*

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## *Abstract*

*We study market reactions to mining developers announcing project finance debt mandates. We document a significant mean (median) 3-day abnormal return of 4.3% (2.77%) and a 5.18% (1.3%) reduction in abnormal return volatility, consistent with information transfer from private lenders to equityholders and reduction in asymmetric information. Thus, the daily market reactions are stronger for debt mandate announcements than for project finance approvals consistent with a greater reduction in information asymmetry and/or the 'retention of the option to wait'. Cross-sectional tests indicate that debt mandates where lenders hold equity positions in the borrower experience higher abnormal returns, suggesting lender equity conveys important signals of information asymmetry reduction for borrowers in project finance.*

*Keywords: Debt mandate, project finance, lender equity, information asymmetry.*

*\* Corresponding author: Andrew Ferguson, UTS Business School, University of Technology Sydney, PO Box 123 Broadway NSW 2007, Australia.*

*Phone: +61 2 9514 3565*

*Fax: +61 2 9514 3669*

*Email address: Andrew.Ferguson@uts.edu.au*

## *Introduction*

Recent data from Refinitiv suggests global project finance (PF) loans in 2020 totalled USD277.6 billion from 901 deals, a decline of 11% compared to the 2019 record amount of USD296.6 billion from 816 deals in 2019. The 2019 figure followed an increase of 5% on 2018 (USD \$282.7 billion (871 deals) which itself was another record. Despite these record levels of PF deals, there is relatively little empirical work on different aspects of PF. A recent study, Ferguson and Lam (2021) (FL, hereafter), has taken advantage of a unique setting in the Australian mining industry ‘*where Australian Securities Exchange (ASX) listed companies own the project companies that hold rights to mineral projects*’ (p.2). They investigate market reactions to PF loan approvals. The objective of this study is to extend work on aspects of capital market reactions to PF loan announcements, to consider the market reactions to an important related event in the PF loan cycle, the debt mandate.

To our knowledge, no other study has considered capital market reactions to debt mandate announcements, with prior US work confined to considering potential moral hazard issues associated with analysts of investment banks winning debt and equity underwriting mandates (Ljungqvist, Marston and Wilhelm, 2006). The focus of Ljungqvist et al. (2006) however is more on the analyst forecast behaviour preceding the debt or equity mandate, as opposed to the process and implications of mandating. Despite the literature void, there is reason to believe debt mandate announcements should be of interest to capital markets researchers. This is because of the sequencing of events in a typical PF loan agreement, where the mandate precedes announcements of the project finance approval (see Appendix A). Thus, in terms of information flow to the capital market, debt mandates potentially resolve more in terms of information asymmetry than a loan approval. The limited descriptive evidence available appears to support this conjecture. For example, FL, Table 5 reports for the sample of 45 debt mandates, the average 3-day CAAR is 4.14% compared to a more modest 3-day

CAAR of 2.61% for loan approvals. To the extent that debt mandating exists more broadly than just the PF context, this may explain why more recent studies of market reactions to bank loan announcements with larger samples have produced mixed results (Fery et al. 2003; Gonzalez 2011; Maskara and Mullineaux 2011).

Like FL, we take advantage of a high information asymmetry setting (Mining Exploration Entities or MEEs) to consider market reactions to announcements of debt mandates. MEEs comprise a significant proportion (around 25% of publicly listed companies in Australia (Bui, Ferguson and Lam, 2020)). The MEE setting is ideal to test whether debt mandates are informative to the equity market, since our sample comprises listed firms in a homogenous industry characterised by substantial information asymmetry, where, most MEEs have no prior borrower track record.<sup>1,2</sup>

We consider a number of questions in relation to PF debt mandate announcements. First, we aim to provide the first evidence of capital market reactions to borrowers announcing PF debt mandates. Theories of adverse selection (Myers and Majluf (1984), Nachman and Noe, (1994) suggest ‘managers will prefer debt to equity financing when they have a substantial amount of private information’. The MEE project life cycle depicts sequential disclosure of mineral resources accompanied by economic feasibility studies. However, managers retain private information in relation to undisclosed geological perspectivity (Bui et al, 2020). Thus, the MEE setting is, consistent with these prior theories, both high in information asymmetry (Leland and Pyle, 1977) and rich in private information. Further, the setting is typified by low

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<sup>1</sup> There are situations where a MEEs obtain ‘seed’ loans from a lender for the completion of a feasibility study or pilot plant construction or a ‘bridge’ loan for either project acquisition finance or pre-construction activity prior to the approval of the PF loan facility. In addition, the MEE setting features the unique provision of small loans from directors to fund early-stage greenfields exploration activities.

<sup>2</sup> As ASX listed companies, announcements by MEEs are publicly available on a timely basis under the ASX continuous disclosure requirements, enabling PF debt mandate announcement dates to be precisely identified (see example in Appendix B).

analyst coverage (Brown, Feigin and Ferguson, 2014) and a lack of prior track record of PF lending to the MEE (Diamond, 1991, Botsch and Vanasco, 2019). Apart from any prior mezzanine (seed) or bridging loans, debt mandate announcements provide the first opportunity for the capital market to assimilate screening effort by banks.

Secondly, Leland and Pyle (1977) postulate that the very existence of financial intermediation is likely due to information asymmetry. MEEs are high in information asymmetry owing to the presence of small firms, highly technical geological information and high frequency of corporate failure (Shah and Thakor 1987). Consequently, debt mandates convey important signals of private information regarding project quality (Diamond 1991). We investigate whether MEEs' PF debt mandates are associated with a reduction in information asymmetry as measured by abnormal return volatility. We also test the conjecture that debt mandates will result in larger market reactions compared to PF loan approvals, as at the mandate stage, the level of contractual engagement by the borrower is lower than for a PF loan approval. This effectively means that the debt mandate announcement has the benefits of information asymmetry reduction without the loss of the option to wait. The option to wait is extinguished when loan documentation is completed, soon after the loan approval is provided (Appendix A).

Thirdly, we examine whether unique lender characteristics in the Australian setting contribute to our understanding of market reactions to debt mandate announcements. In particular, we observe lenders taking equity positions in some MEE borrowers, a practise banned in the US. We envisage that in a high information asymmetry setting, the willingness of a bank to take an equity position in the borrower serves as a vote of confidence in the underlying project quality and mitigates bargaining problems (Mahrt-Smith, 2006). Accordingly, we expect to observe a positive market reaction where financial intermediaries own equity in the borrower.

Last, we re-examine the role of both specialist PF lenders and non-bank lenders in the MEE setting. Interestingly, despite the information asymmetry present in the setting, FL, 2021 find little in the way of either specialist or non-bank lender capital market reactions consistent with prior studies of bank loans (Preece and Mullineaux, 1994, Billett, Flannery and Garfinkel, 1995). However, the non-bank test, in FL, 2021 is constrained by a small sample size (13 deals). By extending the sample period and identifying more debt mandate announcements, we are able to re-examine any non-bank lender effects with a larger sample size (Denis and Mihov, 2003).

The presence of government affiliated lenders is another unique feature of the setting where governments in resource rich countries have built specific policy platforms in an attempt to mitigate moral hazard by effectively co-investing in mining projects. A good example is the well-known Canadian Flow-Through-Share Scheme. In Australia, respective state governments provide competitive exploration incentives, refundable tax credits for exploration and for mine developers, support in financing projects from government affiliated bodies like the Northern Australian Infrastructure Fund (NAIF) and Export Finance Australia. We explore the increasing importance of these government affiliated lenders in mitigating the information problem in relation to PF.

Using the event study methodology, we find that announcements of PF debt mandates are associated with both positive and significant stock price reactions and significant reductions in information asymmetry. On a descriptive level, these returns effects are significantly greater than market reactions to PF loan approvals documented in FL, 2021, suggesting debt mandates are an important signal of private information. In a pooled cross-sectional regression analysis, we find that abnormal returns are higher where the mandates are associated with lenders taking equity positions in the borrower. However, consistent with FL,

2021, no significant wealth effects observed for projects financed by specialist or non-bank lenders.

The remainder of this paper is structured as follows. Section 2 discusses the background literature and develops empirical predictions. Section 3 outlines the sample and research design. Section 4 presents the primary empirical results. Sections 5 and 6 conduct additional analysis and further tests. Section 7 summarizes and concludes.

## **1.0 Sample and Data**

### **1.1 Phases of a Project Finance Loan**

The key phases of a PF loan are detailed in Appendix A, with the process of obtaining a typical PF loan for a mine developer (project sponsor) in the mining industry commencing with the appointment of a financial advisor (FA). The role of the FA is to prepare a ‘bank memorandum’, which is essentially a marketing document promoting a mining developers (project sponsors) bankable feasibility study outcomes to potential lenders.<sup>3</sup> The bankable feasibility study contains estimates of project economic parameters such as capex, throughput and output rates, mine life assumptions, cash costs and commodity price assumptions. Based on these project valuation parameters, lenders are invited to submit ‘indicative term sheets’, which outline the specifics of the quantum of credit a lender may offer, the loan term, the loan pricing, security and recourse provisions and ‘post-completion’ covenants. In other words, the indicative term sheet is a summary of the terms and conditions of a potential PF facility.

After receipt of all indicative term sheets, the borrower or project sponsor, with input from the financial advisor then ‘mandates’ a preferred lender (or lenders in the case of syndicates)

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<sup>3</sup> Philip Cornwell, Richard Gordon and Ben Farnsworth; (see web-link accessed 08/12/2019; <https://www.allens.com.au/globalassets/pdfs/insights/banking-finance/papmar15.pdf>).

who then proceeds with detailed loan documentation and extensive borrower due diligence. The lender due diligence includes detailed input from independent technical experts or advisers in relation to the mineral deposit in question including any fatal flaws in engineering, construction, mining or geopolitical risks. The due diligence (screening) process is extensive as it is often the case that the mining industry borrower seeking project finance has no prior credit history (Diamond, 1989). That is because MEEs who make discoveries and then conduct feasibility studies (See Appendix B) are in most cases all equity financed prior to obtaining credit approval from the banks credit committee (Myers and Majluf, 1986)<sup>4,5</sup>.

Following the lenders credit committee approval and provision of a 'letter of offer' to the borrower, there are normally conditions precedent to be satisfied, which for mining developers normally includes required equity raisings to be conducted and any revenue protection (hedging) measures to be completed including the possible acquisition of political risk insurance by the borrower. Following the completion of all condition's precedent, loan drawdowns are able to commence, which will often involve multiple tranches, where the drawdown of subsequent loan tranches is conditional on satisfactory progress in relation to construction and development milestones and timelines. It is important to note that debt mandates are usually associated with project finance loans, but in some cases can be disclosed for lenders providing loans for project acquisitions, for bridging finance (often to cover pre-development costs or for paying deposits on long-lead time capital equipment orders), or for oil and gas drilling campaigns. Thus, whilst the mandate process is likely to

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<sup>4</sup> For a detailed discussion of what is involved in Bank memorandum's refer to 'A typical debt mandate' by Castle Partners Investment Bank. (see web-link accessed 08/12/2019; <https://www.castlepartners.com.au/services/a-typical-debt-mandate.html>).

<sup>5</sup> In most cases Mining Exploration Entities (MEEs) are all equity financed prior to project development, but it is possible they have accessed loans from directors, engaged in convertible note issues (that typically result in equity issues), or have accessed minor mezzanine or seed loans from banks for completion of bankable feasibility studies which may or may not involve pilot plant construction.

have PF related idiosyncrasies, there is likely to be similarities with corporate finance lending more broadly (Lungqvist et al. 2006).

## **1.2 Data sources**

The sample consists of PF debt mandate announcements made on the ASX over the period from 1995-2021, extending the sample coverage by 7 years . Like FL, 2021, two primary sources are used to obtain mandate announcements (Morningstar Datanalysis Premium and Factiva). A sample of 194 debt mandates is obtained filtering on Energy and Materials Global Industry Classification (GICS) sectors. Useable stock returns data are obtained for 184 announcements (Table 1).

[Insert Table 1 here]

## **1.3 Debt mandates by year, commodity, and host country**

The distribution of debt mandates over time is shown in Table 2. Descriptive statistics in Table 2 indicate small numbers of mandates (5 or less) prior to 2005-2006 when a large spike occurs (14 and 10 in each year, respectively). The greatest number of mandates occurs over 2011-2012 (14 and 16, respectively) consistent with a period known as the ‘mining boom’. By underlying commodity, precious metals (which are predominately gold projects) accounts for 54 mandates or 29.3% of the sample, with 53 (28.8%) of mandates awarded for projects being non-ferrous (base) metals mandates and 41 mandates (22.3% of the sample) observed for speciality metals which includes some ‘battery metals’ such as lithium, graphite and rare earths. Oil and Gas projects comprise 15 or (8.2%) of the sample.

[Insert Table 2 here]

Of the 184 mandates, 42.9% are for projects located in Australia, whilst 57.1% are for off-shore projects (Table 3). The larger mandate sample has a slightly more international focus



compared to FL, 2021 who report 59.1% of their loan approvals being for domestic projects (40.9% offshore). This change may in part reflect the recent growing willingness of Australian project sponsors to seek projects internationally in the ‘critical minerals’ domain.

[Insert Table 3 here]

#### **1.4 Lender participation**

Bank lender participation in debt mandate announcements is documented in Table 4, Panel A. Many similarities exist between these mandate award descriptives and those PF loan approvals reported in Table, 3, Panel A in FL, 2021. For example, Macquarie Bank is associated with the largest number of total mandates (18), with 10 as a sole or lead arrangers and 8 as a syndicate participant or is involved in 9.8% of mandates. Rothschild/Investec is the second largest lender with 11 sole or lead arranger and 2 syndicate participations. Having the same total number of mandates is Standard Bank with 4 sole or lead arranger roles and 9 syndicate participations. An interesting feature of Table 4 is the absence of any significant presence of Bank of Scotland. However, Bank of Scotland was the third largest originator of project finance approvals. This highlights the non-binding nature of mandate awards.<sup>6</sup>

Table 4, Panel B depicts non-bank lender participation. We document a total of 17 mandates awarded to government-affiliated financial institutions (16 sole arrangers and 1 syndicate participation). There are 12 mandates in total provided to investment funds (11, 1), 4 non-syndicated mandates awarded to industry partners (mining companies), 3 mandates awarded to equipment suppliers (2,1) and 2 to commodity traders (2,0). The increased incidence of

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<sup>6</sup> Using recently hand collected mandate data, of the 115 sample constituents in FL (2021), we identify 46 releasing debt mandate announcements. Of these 46, 6 have mandates that involve the reversal of a prior mandate and the re-mandate of an alternative financier. A further 4 mandate awards are reversed at the financing stage (the ultimate project financier is different to the mandated financier). Lastly, 15 (32.6%) of the most recent mandate awards have a change in the syndicate participants (either adding further syndicated financiers, deleting a mandated financier or report another change in the composition of financiers) at the PF stage.

government affiliated lenders, this is likely due to recent growing concerns about future critical metals supply.

[Insert Table 4 here]

### **1.5 Mandate characteristics**

We report characteristics of debt mandates in Table 5. The average number of lenders in each mandate is 1.41 with the median being a sole mandate (FL, 1.58,1). The loan size is disclosed by 110 mandate announcers, with the average loan size being \$AUD180.65million (FL, \$107m). The median loan size, is much smaller (\$64.39m) (FL, \$53m). For the 110 mandates disclosing loan amount, the loan amount scaled by total assets has a mean (median) of 7.09 (1.86) (FL, 2.31, 1.24). The increase in relation to FL is likely to reflect three factors. Firstly, the mandate award might be scaled back by the lender, when the credit approval is ultimately provided. Secondly, more recent mandates, especially for some critical metals projects reflects significant project cost inflation in recent times. Lastly, it is possible that the 74 mandates not disclosing loan amounts are smaller, thus the descriptive statistics for this measure are biased upwards.

It is observed that 18.5% of the sample are re-mandates. That is, a mandate is either renewed, or a mandate is subsequently awarded to another lender. 19.6% of projects involve joint ventures, which is slightly less than the 27.8% reported in FL, 2021. Foreign projects account for 57.1% of the sample compared with 40.9% in FL, 2021. Syndication occurs in 31.5% of mandates, similar to 35.7% in FL, 2021. Lender equity is observed in 7.1% of debt mandates. This is slightly lower than the 23.5% observed in FL, 2021, but is likely to reflect that at the mandate stage, less is owing to the bank in terms of arrangement fees, which are often waived by the bank in return for common stock or options in the borrower. Hedging is required in 19.6% of mandates compared to 40% in FL, 2021, but this likely again reflects the

preliminary stage of negotiation of the mandate vis a vis the loan approval and the fact that the output of a number of recent specialty metals projects are unhedged.

There is disclosure of 43 (20.7%) of mandates accompanied by a financial advisor. Burnvior Corporate Finance is the clear market leader in terms of financial advisory roles disclosed in 7 debt mandates. Noah's Rule, Optimum Capital, Rothschild and SMS Financial Services each are disclosed in 3 debt mandate announcements. In terms of specialist lenders, Macquarie bank is the leading bank in terms of mandates (10%), (FL, 21.7%). The Top 3 banks have 20.7% of mandate awards (FL, 42.6%).

[Insert Table 5 here]

### **1.6 Borrower characteristics**

In terms of borrower characteristics, firms awarding debt mandates have mean (median) total assets of \$64.15 million (\$29.69 million) compared to \$71.9 million (\$41.5 million) in FL, 2021 (Table 5, Panel B). In terms of market capitalization, firms awarding mandates have a mean market capitalization of \$141.3 million (\$57.36 million) compared to \$198 million (\$100 million) in FL, 2021. This is intuitive since the debt mandate precedes the loan approval and a small number of firms with lower quality projects may award mandates, but not get final bank credit committee approved offers of project finance. The revenue to total assets ratio has a mean (median) of .09 (0), similar to FL, 2021, (.06,.01) reflecting the fact that MEEs are largely pre-revenue generation.

MEEs balance sheet consists of cash and deferred exploration expenditure accounted for under IFRS 6 (Ferguson, Kean and Pundrich (2020). MEEs awarding debt mandates have a mean (median) cash to total assets of .27 (.19), almost identical to FL, 2021 (.28, .20). All the debt ratios exhibit means (medians) close to zero and are very similar to those reported in FL, 2021. The mean (median) accumulated losses are \$-31.59 million (\$-18.57 million) reflecting

persistent loss-making of MEEs during the pre-project development phases (FL, 2021, Appendix A).

The mean number of shares held by the Top 20 shareholders is 61% (FL, 63%), reflecting the lower level of institutional ownership of these entities due to their high-risk nature. On average, CEO's own a mean (median) of 4% (1%) of the issued capital of the MEE which is the same as in FL, 2021. Combined, the CEO and other directors own a mean (median) 13% (7%) of the issued capital compared to 11% (7%) in FL. This is intuitive as CEO and director shareholding is likely to be diluted after the debt mandate as many PF loan agreements require an equity issue as a condition precedent to loan approval (the equity component). Finally, the sample comprises 7.1% of oil and gas constituents reflecting the relative mix of mining and oil and gas listed participants in Australia, which is the reverse of the pattern in the US (Distadio, Ferguson and Lam, 2023).

## **2. Market Reactions to debt mandates**

### **2.1 Stock price responses**

#### **2.1.1 Empirical prediction**

FL (2021) describe in detail the high information asymmetry setting for MEEs. They also summarize an extensive literature pertaining to the benefits of bank loans. In the interests of brevity, in such a setting, bank loans will benefit MEEs which are characterised by a lack of monitoring (Diamond 1984), a poor information environment (Dhaliwal, Khurana, and Pereira 2011), high information asymmetry (Boyd and Prescott 1986), low analyst coverage (Best and Zhang 1993, Brown, Feigin and Ferguson, 2014), high risk (Diamond 1991), and small firm size (Fama 1985). These are all characteristics of MEEs (Bui, Ferguson, and Lam 2021, FL, 2021, Distadio and Ferguson, 2021).

Banks also provide screening benefits due to private information, which as suggested, is likely to be important for MEEs (Leland and Pyle 1977, Ross (1977). Banks also provide ex-post monitoring (Diamond 1991; Faulkender and Petersen 2006; Mester, Nakamura, and Renault 2007) which is part of the certification role in the PF literature and is to reduce potential moral hazard problems (Esty and Megginson 2003). An interesting case is loan initiation where screening is conducted for the first time and a more unambiguous quality signal vis a vis subsequent loans (Diamond 1991).<sup>7</sup> Further, in the PF context, banks are argued to signal contract enforceability, particularly in countries with high-risk legal and political systems (Esty and Megginson 2003). For these and other reasons PF theorists suggest PF loans should exhibit positive market reactions (John and John (1991). Ferguson and Lam (2021) provide evidence supporting these conjectures in relation to their empirical tests of market reactions to PF loan approvals. We expect that debt mandates as a signal of bank screening that precedes the bank loan approval will have beneficial implications for a reduction in information asymmetry and lead to positive market reactions.

Mining projects are richly endowed with embedded options (Brennan and Schwartz, 1985). One key option parameter is the timing of project development or the option to wait (Paddock, Siegel, and Smith 1988). In mining projects, this option to wait is likely to be important to the project sponsor owing to the long project development lead times and the presence of cyclical commodity prices. For example, FL, 2021 compare the mining project life cycle with the biotechnology drug development process, each of which lasts decades (Robinson and Stuart, 2007), Lerner Shane and Tsai (2003). For projects that can last up to 30 years pre-development,

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<sup>7</sup> Prior studies have examined the information content of new loans and loan renewals, but not loan initiations. For example, Lummer and McConnell (1989) classify a “new” loan as a firm that arranges a loan with a new bank where the firm has no prior credit history, stating: “Except for five cases, all of the firms in our sample that announce new credit agreements had some prior bank financing in place, albeit with a different bank”. This approach has been adopted in subsequent studies, such as Slovin, Johnson, and Glascock (1992), who state: “New credit agreements with new banks are classified as initiations, even if other bank debt may exist.” In other words, moving from an environment of no bank monitoring to one with bank monitoring in our setting is arguably more informative than an existing borrower obtaining a new (additional) loan from another bank.

optimal timing of the development decision is likely to be significant. Other studies like Ingersoll and Ross (1992) suggest project valuation is highly sensitive to future interest rate movements, whilst McDonald and Siegel (1986) suggest managers of projects should wait to invest until such time as the present value of the project exceeds a certain benchmarks in terms of capital investment. Whilst we know very little about the precise investment hurdles in PF loans, profitability benchmarks or heuristics likely exist. We infer this due to a number of project finance loan approvals referring to ‘standard’ debt / equity or capital structure ratios used in relation to project capital expenditure.

Bernanke (1983) discusses the option to wait from an information arrival perspective, suggesting deferral of investment decisions is optimal if improved information allows managers to make better decisions. The importance of information arrival in the mining industry extends beyond information on interest rates to changes in the underlying commodity price and other factors such as political uncertainty (Ferguson, Hu and Lam, 2022). The key distinction then between the award of the debt mandate and the subsequent loan approval is effectively the loan approval marks the beginning of the formal contractual relationship with the bank, whilst the debt mandate is simply selection of a preferred financier, with less in the way of contractual commitment and enforceability. This means that at the debt mandate stage, the option to wait still exists and is retained by the borrower, while at the PF approval stage, the option is, or soon after when loan documentation is complete, extinguished. This leads us to predict that the market reaction to the debt mandate will be both positive and of a greater magnitude than the market reaction to the subsequent loan approval.

Thirdly, we examine whether unique lender characteristics in the Australian setting contribute to our understanding of market reactions to debt mandate announcements. In particular, we observe lenders taking equity positions in some MEE borrowers, a practise banned in the US. Mahrt-Smith (2006) develops a theoretical model showing that a small equity stake held by a

bank can have beneficial effects. Mahrt-Smith (2006) suggests lenders taking equity in borrowers reduces the ability of the lender to extract rents from the borrower. This is argued to be particularly the case for small firms, who are likely to suffer from weaker client bargaining (FL, 2021). Using a small sample of debt mandates awarded to lenders having equity stakes in borrowers, we test whether any beneficial effects of lender-equity is observed and thus contribute to the ongoing debate in corporate finance circles about removing lender-equity restrictions.

Last, we examine the role of both specialist PF lenders and non-bank lenders in the MEE setting. Interestingly, despite the information asymmetry present in the setting, FL, 2021 find little in the way of either specialist or non-bank lender capital market reactions consistent with prior studies of bank loans (Preece and Mullineaux, 1994, Bellet, Flannery and Garfinkel, 1995). However, the FL (2021) non-bank test is constrained by a small sample size (13 deals). By extending the sample period we are able to re-examine any non-bank lender effects with a larger sample size (Denis and Mihov, 2003). The presence of government affiliated lenders is another unique feature of the setting. To mitigate information asymmetry in the MEE sector, governments around the world have built specific policy platforms in an attempt to mitigate moral hazard by effectively co-investing in mining projects.<sup>8</sup>

### *2.1.2 Announcement return measure*

Stock price reactions to firms' announcements of debt mandates are calibrated by computing daily abnormal stock returns surrounding loan announcements as follows:

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<sup>8</sup> One well-known Canadian Flow-Through-Share Scheme. In Australia, respective state governments provide competitive exploration incentives, refundable tax credits for exploration and for mine developers, support in financing projects from government affiliated bodies like the Northern Australian Infrastructure Fund (NAIF) and Export Finance Australia. We explore the increasing importance of these government affiliated lenders in mitigating the information problem in relation to debt mandating.

$$AR_{i,t} = \ln \left[ \frac{P_{i,t}}{P_{i,t-1}} \right] - \ln \left[ \frac{P_{m,t}}{P_{m,t-1}} \right], \quad (1)$$

where  $AR_{i,t}$  is the abnormal (market-adjusted) return of firm  $i$  on day  $t$ ,  $P_{i,t}$  is the closing stock price of firm  $i$  on day  $t$ , and  $P_{m,t}$  is the closing value of ASX's All Ordinaries Index  $m$  on day  $t$ .<sup>9,10</sup> The cumulative abnormal return ( $CAR$ ) for firm  $i$  is the summation of the daily abnormal returns over the event window  $(q, s)$ , calculated as:

$$CAR_i(q, s) = \sum_{t=q}^s AR_{i,t} \quad (2)$$

For each announcement type, we average  $CAR_i$  across the sample firms to obtain a cumulative average abnormal return ( $CAAR$ ). We expect  $CAAR(q, s)$  to be positive and significant, implying PF loans are value enhancing.

### 2.1.3 Results

Table 6, Panel A, reports evidence on share price reactions to firms making various types of PF loan announcements. For the full sample of 184 debt mandate announcements over a the standard event window  $(-1, 0, 1)$ , we observe an average (median) cumulative abnormal return of 4.31% (2.77%), significant at the 1% level using both parametric (BMP) and non-parametric (CZ rank) tests.<sup>11</sup> For alternative event windows of  $(0, 1)$  and  $(-1, 0)$  we report mean (median) abnormal returns of 4.62% (1.84%) and 3.21 (1.61%) respectively, again both parametric and non-parametric tests statistics are significant at the  $p < .01$  level in each case. The daily abnormal return on  $(-1)$  has a mean (median) of  $-.0025$  ( $-.001$ ) respectively, which indicates the absence of any information leakage. Overall, this univariate result provides strong support for assertions that PF debt mandate announcements are associated with positive abnormal returns.

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<sup>9</sup> All prices are adjusted for changes in the basis of quotation, such as dividends on the ex-dividend day and, more likely in this setting, capital reconstructions.

<sup>10</sup> The All Ordinaries Index is a market capitalization-weighted index comprising the largest 500 ASX-listed companies and represents over 99% of market capitalization of the ASX. For robustness, we also use the "Small Ordinaries Index" as an alternative benchmark for computing abnormal returns (see Table 5).

<sup>11</sup> The BMP test is a parametric test based on standardized residuals corrected for event-induced changes in volatility (Boehmer, Masumeci, and Poulsen 1991). The CZ rank test is the Corrado and Zivney non-parametric rank test corrected for event-induced volatility of rankings (Corrado and Zivney 1992).



[Insert Table 6 here]

For robustness, we repeat the event studies by replacing the All Ordinaries Index used in our primary tests with the Small Ordinaries Index.<sup>12</sup> The results using the Small Ordinaries Index (Table 6, Panel B) are very similar, albeit slightly stronger, suggesting our results are not sensitive choice of return benchmark.

Table 7 reports subsample results of stock price responses based on certain loan, lender and project characteristics. In Panel A, we firstly stratify the sample into loans from bank and non-bank lenders. Univariate tests of both the mean and median CAR show that loans with bank lenders and non-bank lenders show no difference in mean (median) abnormal returns. Panel B compares loans granted by specialist (top three lenders in terms of number of PF deals in the sample) vis-à-vis non-specialist lenders. Again, no significant differences in abnormal returns are detected. Panel C contrasts loans for mandate announcements disclosing a financial advisor and those that do not. Consistent with results in Panels A and B, Panel C shows, no difference between debt mandate announcements disclosing financial advisors and those that don't. Lastly, in Table 6, Panel D, we report evidence of debt mandates where there is evidence of prior mezzanine (seed) loans or bridging finance prior to the debt mandate announcement. Again, there is no significant difference in returns partition the sample on this basis.

[Insert Table 7 here]

In summary, analysis of univariate results indicates debt mandate announcements result in positive abnormal returns consistent with our first empirical prediction. Likewise, the descriptive statistics indicate that the returns around debt mandate announcements are materially larger than those for PF loan approvals reported in FL, 2021, consistent with our second conjecture. Subsample results indicate no difference in stock price reactions between

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<sup>12</sup> The S&P/ASX Small Ordinaries Index is commonly used as a benchmark for ASX-listed small capitalization stocks.

sample partitions based on banks versus non-banks, specialists versus non-specialists, disclosure of financial advisors versus non-disclosure advisors or the presence of lender prior track-record.

## **2.2 Information asymmetry proxy**

### *2.2.1 Information asymmetry and financial intermediation*

Theories of financial intermediation explain the role of banks in reducing information asymmetry. For example, Leland and Pyle (1977) suggest that information asymmetry may be the primary reason why intermediaries exist. Campbell and Kracaw (1980) and Best and Zhang (1993) argue that an important function of financial intermediaries is to produce information. Diamond (1984) posits that banks possess private information which, when conveyed to the market through loan approvals, lowers the borrower's information asymmetry.

The notion of bank loans being associated with a reduction in the borrower's information asymmetry is consistent with Fama (1985), who asserts that many organizations pay periodic monitoring fees for lines of credit from banks even though they frequently remain unused. The sole purpose of maintaining the loans is to provide positive signals about the firm's private information. The presence of bank debt in a firm's capital structure is seen to lower information asymmetry and attenuates IPO under-pricing (James and Wier 1990; Slovin and Young 1990), negative share price response to SEOs (Slovin, Sushka, and Hudson 1990), as well as the cost of debt capital for bond issuances (Datta, Iskandar-Datta, and Patel 1999; Dailami and Hauswald 2007; Buscaino et al. 2012). If banks help mitigate information asymmetry, a reduction in the borrower's bid-ask spread after a PF loan announcement is expected.

### *2.2.2 Proxy for information asymmetry*

We proxy for the change in the borrowers' information asymmetry in the period surrounding a PF loan announcement as the abnormal (mean-adjusted) change in the bid-ask spread in the same manner as Ferguson and Lam (2021):

$$SPREAD_{i,t} = \left[ \frac{(AskPrice_{i,t} - BidPrice_{i,t})}{1/2(AskPrice_{i,t} + BidPrice_{i,t})} \right] \quad (3)$$

$$ESPREAD_i(p, q) = \frac{\sum_{t=p}^q SPREAD_{i,t}}{(q-p+1)} \quad (4)$$

$$ASPREAD_{i,t} = SPREAD_{i,t} - ESPREAD_i(p, q), \quad (5)$$

where  $SPREAD_{i,t}$  is the daily bid-ask spread for the stock of firm  $i$  on day  $t$ , calculated as the difference between the closing ask price ( $AskPrice_{i,t}$ ) and closing bid price ( $BidPrice_{i,t}$ ) divided by the closing mid-point price.  $ESPREAD_i$  is the average daily bid-ask spread for the stock of firm  $i$  over days  $p$  to  $q$  in the pre-event window, where  $p$  and  $q$  are set as  $t - 100$  and  $t - 15$ , respectively.  $ASPREAD_{i,t}$  is the abnormal bid-ask spread, calculated as the difference between  $SPREAD_{i,t}$  and  $ESPREAD_i$ . We construct a cumulative abnormal spread (CAS) measure for firm  $i$  by summing up the abnormal daily spread over the event window ( $q, s$ ) as follows:

$$CAS_i(q, s) = \sum_{t=q}^s ASPREAD_{i,t} \quad (6)$$

Similar to the abnormal returns, we construct a cumulative average abnormal spread (CAAS) by averaging  $CAS_i$  across firms for each announcement type. We predict that  $CAAS(q, s)$  should be negative and significant, implying a reduction in information asymmetry as a result of firms' announcements of PF loans.

### 2.2.3 Results

Table 8 reports bid-ask spread responses to debt mandate announcements where we observe a mean (median) -5.18% (-1.3%) reduction in 3-day CAAS, significant at  $p < 0.01$  (both BMP test

and CZ rank test).<sup>13</sup> This suggests PF loan announcements by MEEs are generally associated with a reduction in bid-ask spread, our proxy for information asymmetry.

[Insert Table 8 here]

### 3. Factors Influencing Wealth Effects of Project Loan Approvals

To provide insights on the cross-sectional variation of the abnormal returns surrounding announcements of PF debt mandates, we employ a pooled OLS regression approach and specify the regression model as follows:

$$\begin{aligned} CAR_i = & \beta_0 + \beta_1 LenderEq_i + \beta_2 Specialist_i + \beta_3 NonBank_i + \beta_4 JV_i + \beta_5 GPU_i + \\ & \beta_6 Advisor_i + \beta_7 LogCRBVol_i + \beta_8 Remandate_i + \beta_9 Oil\ and\ Gas_i + \\ & \beta_{10} Volatility_i + \beta_{11} Log(MCap)_i + \beta_{12} AccLoss/TA_i + \beta_{13} Top20_i + \\ & \beta_{14} MgntShdg_i + \varepsilon_i, \end{aligned} \quad (7)$$

where the dependent variable  $CAR_i$  is the 3-day cumulative abnormal return for firm  $i$ , calculated as per Equation (2). For testing the effect of lender equity we include  $LenderEq$ .  $LenderEq$  is a binary variable with a value of one if it is disclosed within the PF loan announcement or prior fiscal year annual report that the lenders own shares, warrants or options in the borrower, and zero otherwise. A positive association is predicted between lenders holding equity in the firm and the market reaction on the basis that the lender believes the project has upside potential and may signal lender private information (Leland and Pyle 1977).

In an augmented specification of Equation (7), we construct two proxies of specialist lender in a similar manner to Lin et al. (2012) and FL (2021) in relation to syndication. The lender awarded the greatest number of mandates (Macquarie Bank) is denoted specialist lender ( $SpBank1$ ), whilst a second proxy ( $SpBank3$ ) extends the definition of specialist lender to the top-three banks (Macquarie Bank, Rothschild/Investec). In addition, an  $NonBank$  indicator variable is constructed with a value of one if none of the lenders awarded the mandate are

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<sup>13</sup> Datastream provides bid and ask prices only after 19 June 2001, restricting results to a sample of 211 PF announcements.

classified as a commercial bank, and zero otherwise. We refer to *SpBank1*, *SpBank3* and *NonBank* collectively as “lender identity” proxies. If the specialist banks are superior in screening and monitoring loans, a positive coefficient on *Spbank1* and *SpBank3* is expected. In further tests of lender identity, given the larger number of *NonBank* lenders compared to FL (2021), we partition this category into a number of sub-categories; *Mining*, denoting mining industry participants, *Government* denotes nonbank lenders affiliated with respective governments and lastly *Investment\_Fund* refers to nonbank lenders who are investment funds. We include *AcctLoss/TA* to control for project sunk costs. The larger the spend on the project pre-development, the more likely the project is an older, better known project or one with more exploration and feasibility studies conducted. In terms of project level controls, we include *GPU* and *JV* in the model specification.

We include several firm-level controls in the regression model. *Log(MCap)* measures firm size and is computed as the natural logarithm of the borrower’s market capitalization five days before the loan announcement. We expect firm size to have a negative relation with abnormal returns. Smaller firms are likely to have higher levels of information asymmetry and benefit more from signals of successful financing (Fama 1985; Diamond 1989; Slovin, Johnson, and Glascock 1992). In addition, the same amount of extra value created would translate into a smaller percentage gain for larger firms. *Volatility* is measured as the standard deviation of daily stock returns in the 12 months preceding the announcement date of a loan. Stock volatility is a measure of total firm risk, proxying for investors’ perception of the uncertainty regarding the expected future cash flows of the MEE. Firms with higher volatility would benefit more from the debt mandate, which helps to lower the uncertainty surrounding future project funding. Thus, we expect a positive association between stock volatility and announcement returns. *Top 20* is the percentage shareholding of the top-20 shareholders in the MEE. Large shareholders play a significant monitoring role in the corporate governance structure of firms

to mitigate agency problems (Claessens et al. 2002).<sup>14</sup> We expect a positive association between top-20 shareholding and announcement returns. *MgmtShdg* is the percentage shareholding of the corporate insiders (directors and CEO). A higher percentage of insider shareholding implies a better alignment of management incentives with the interests of the shareholders and therefore a positive association with abnormal returns is expected. As suggested by Leland and Pyle (1977), a manager's investment in a project serves as a signal of project quality. In addition, we control for price changes in the commodities market by including *LogCRBVol*, computed as the return on the Thomson Reuters/Core Commodity CRB Index over the 12 months immediately preceding the PF loan announcement and we predict positive commodity price changes are associated with higher abnormal returns. We include two disclosure related variables. *Advisor* indicates the presence of a financial advisor disclosed in the debt mandate announcement. Lastly, we include the variable *Remandate* to control for debt mandate announcements preceded by another debt mandate (i.e., a mandate reversal), or a mandate which is itself renewed.

The model specification in Equation (7) and the augmented model with lender identity are estimated using a pooled OLS regression procedure with robust standard errors (Petersen 2009) to correct for potential industry and time clustering.

### 3.5 Cross-sectional results

Table 9 presents OLS regression results for the determinants of market reactions to PF debt mandate announcements. The dependent variable used is the 3-day cumulative abnormal return,  $CAR(-1, 1)$ .

[Insert Table 9 here]

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<sup>14</sup> The 'Top 20' shareholders is a mandatory filing to be included in ASX-listed companies' annual reports.

Column 1 reports regression results for the baseline model. The model reports an adjusted  $R^2$  of .092, with the  $F$  statistic significant at  $p < .01$ . The coefficient on *Volatility* (proxying for total firm risk) is positive (0.424) and significant at  $p < 0.05$ , indicating high-risk firms have stronger market reactions. *Oil & Gas* is the dummy variable controlling for energy constituents. The *Oil Gas* dummy is negatively signed (-0.046) and significant at the  $p < .01$  level, suggesting mandates for energy projects perform significantly worse. The other control variables including *Joint Venture*, *Advisor*, *Remandate*, *Log(MCap)*, *AccLoss/TA*, *MgmtShdg* and *Top 20* are, however, not significant in explaining the cross-sectional variation in the announcement *CAR*. Including GPU in the model (column 2) makes no difference to overall results.

In terms of test variables, the coefficient on *Lender\_Equity* in Columns 1-3 remains positive (0.047, 0.045 and 0.046, respectively) and significant at the 5% level. This suggests that debt mandates where lenders hold equity in the project sponsor exhibit stronger market reactions, consistent with a reduction in bargaining power of the bank and lower information asymmetry (Mahrt-Smith, 2006).

Columns 3–7 exhibit results for testing our lender identity proxies (specialist banks and nonbanks). The effect of specialist lender is assessed by including *SpBank1* and *SpBank3* in the model. However, the estimated coefficients on both *SpBank1* (Column 3) and *SpBank3* (Column 4) are insignificant, indicating no support for the reputation or certification effects. In contrast, the absence of any difference in terms of announcement *CAR* for the specialist lenders is more consistent with the market or bargaining power argument (Stomper 2006; McCahery and Schwienbacher 2010, FL, 2021). These results may suggest that any positive lender reputation effect is offset by market awareness of tougher loan terms imposed by larger specialist banks.

When the lender type variable *NonBank* is added to the model (unreported), the estimated coefficient is not significant. This result indicates that debt mandates issued to non-bank

lenders are associated with market reactions no different to loans issued by banks, consistent with prior studies (Preece and Mullineaux 1994; Billett, Flannery, and Garfinkel 1995, FL, 2021). Results partitioning *Nonbank* into three sub-groups being *Mining*, *Government* and *Investment\_Fund* are shown in columns 5-7. *Mining* are mining companies, whilst *Government* denotes nonbank lenders affiliated with respective governments. Lastly, *Investment\_Fund* refers to nonbank lenders who are investment funds. When separately including *Mining* in the model, the coefficient is positive (0.152) and significant at the  $p < .05$  level (Column 5). This is perhaps unsurprising as larger mining companies may bring other forms of technical and operational expertise to a project, without the bargaining problems associated with banks and commodity traders (Distadio and Ferguson, 2022). We next sequentially add *Government* and *Investment\_Fund* in columns 6-7, however both the coefficients on these two *NonBank* proxies are insignificant. Overall, these regression results are, with the exception of mining industry participants, not consistent with specialist bank nor nonbank lender effects on debt mandate announcement returns. Results in models reported in columns 3-7 show that controlling for both specialist and non-bank lender effects have no effect on the significance of *Lender\_Eq*.

#### **4. Additional Analysis**

##### *Inclusion of loan size*

FL (2021) include *LoanTA*, measured as loan amount divided by total assets to control for the relative size of the PF loan. However, loan amount is only disclosed in 110 mandate announcements. We control for loan by including a dummy variable, *Loan Disclosure*, to control for this disclosure of the loan amount as a separate term in the model specification in (7). As reported in Table 10, adding a control variable controlling for loan amount disclosure does not alter primary results.

##### *Adding back bridge loans*



In further additional tests in Table 11, we include 5 projects, where the debt mandate announcement is for a bridging loan as opposed to a project finance facility. When re-running primary results in Table 9 including smelter projects, we observe no change in our primary results, with the exception that the coefficient on *Investment\_Fund* is negative (-0.033) and significant at  $p < .05$  level. This could indicate that firms unable to obtain bank loans are forced to rely on other sources which could subject the borrower to tougher loan terms.

#### *Adding back smelter projects*

In further additional tests in Table 12, we include 4 projects, where the debt mandate announcement is for a smelter project as opposed to a mine. When re-running primary results in Table 9 including smelter projects, we observe no change in our primary results, with the exception that the coefficients on both *JV* and *Log(MCap)* are now negative and significant at the  $p < .10$  level. This suggests projects that are joint ventures and larger project sponsors result in lower abnormal returns around debt mandate announcements.

#### *Price sensitivity of announcements, announcement noise*

A small number of debt mandates (21) are not labelled as price sensitive by the Australian Securities Exchange (ASX). Most announcements are stand-alone announcements in a sense that the announcements occur separate to the filing of quarterly activities reports for MEEs. Only 10 mandates are announced within quarterly activities reports. We re-run primary analysis by pooling non-price sensitive announcements with announcements in quarterly reports and add a separate dummy variable ‘*Noise*’ to the model specification in (7). This dummy variable is negatively signed as expected and significant at  $p < .05$  level. When adding this variable to the model as reported in Table 13, *Investment\_Fund* and the *Log(MCap)* are negative and significant at  $p < .05$  and  $p < .10$  levels respectively. Further, *LenderEq* weakens slightly and is significant at the  $p < .05$  level in 4 of 7 primary models.

#### *Borrower Track Record*

Project finance sponsors can obtain small ‘seed’ or mezzanine loans earlier in the mine development life cycle normally for the purposes of conducting what are known as bankable feasibility studies (BFS). The BFS normally takes around a year to complete and is quite expensive for MEE’s who can obtain small seed loans of between \$1m-4m for these purposes. A number of seed loans are written by Macquarie Bank and other bank lenders, but investment funds have recently begun to engage with project sponsors at this stage of the mine life cycle. Ostensibly, this means the MEE’s banking relationship can start before the PF debt mandating (Diamond, 1991). Where seed loans are present, we would expect much of the screening benefits and information asymmetry reduction to be priced at the seed or mezzanine announcement date and so would expect a negative co-efficient on *Track\_Record* at the debt mandate announcement stage. Consistent with expectations, unreported analysis shows *Track\_Record* has a negative coefficient, significant at the  $p<.05$  level. There is no change to the strength of the *LenderEq* co-efficient. *JV* is negative and significant at the  $p<.10$  level in 2 of 7 models, whilst *Investment\_Fund* is negative and significant at the  $p<.10$  level.

### *Hedging*

Hedging requirements play a less important role at the debt mandate stage compared to the PF approval phase with a smaller number of observations discussing hedging requirements in mandate award announcements. However, we add a separate control variable to the primary model in (7) to control for required hedging in Table 14. The coefficient on *Hedging* is negative and significant at the  $p<.01$  level in 2 of 7 models, and at  $p<.05$  level in 4 of 7 models. *LenderEq* remains significant as previously discussed, while *Investment\_Fund* and *Log(MCap)* has a negative coefficient and is significant at the  $p<.10$  level.

### *Disclosure of lender identity*

We identify a number of debt mandates where lender identity is not disclosed. We re-run primary analysis in Table 9 two ways. Firstly, we delete observations where lender identity is not disclosed (7 observations) resulting in a final sample of 175. Secondly, we re-run primary analysis in Table 9 including a separate dummy variable for no lender disclosed. In both cases, the primary results in Table 9 are unchanged.

#### *Other tests*

*Syndic* is a binary variable taking the value of one if the loan is syndicated, and zero otherwise. A loan is classified as syndicated if there is more than one lender participating in the PF deal (Lin et al. 2012). *Offtake* is a binary variable that equals one if an offtake agreement is either proposed or in place and disclosed in the PF announcement, and zero otherwise. We expect a positive association between the presence of an offtake agreement and the market reaction to the announcement of the loan as there is a guaranteed purchaser of the mine production output.<sup>15</sup>

## **5. Conclusion**

Mine development is a high information asymmetry setting. Using a hand-collected sample of debt mandates announced by Australian MEEs, we provide evidence showing these announcements convey important information to the capital markets. On a descriptive level, Debt mandates are shown to exhibit abnormal returns of greater magnitude than PF loan approvals. This is an interesting finding given the differing level of contractual completeness in different stages of the PF loan cycle. Debt mandates are similar to memorandum of understandings or MOU's and are therefore less concrete than credit committee approved offers of PF or loan approvals. This contractual incompleteness provides benefits of

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<sup>15</sup> Offtake agreements often involve counterparties providing technical and even financial support to the mine developer during the construction process, suggesting similarities to collaborative alliances in the biotech sector. They are more common for base metals projects and other commodities with very specific end users and outputs requiring further processing.

information asymmetry reduction whilst preserving the option to wait, of great value to mining developers. Differential market reactions exhibited at different stages of the PF loan cycle is an interesting finding in the corporate finance literature.

To our knowledge, we conduct the first empirical tests in the corporate finance literature on an interesting feature of PF loans, being the presence of lenders taking equity in the holding company project sponsors. Lender equity has been controversial in the banking industry, with a moratorium on such practise in the US (Mahrt-Smith, 2006). Mahrt-Smith (2006) however provides a theoretical model suggesting lender equity reduces the bargaining power of the bank, resulting in beneficial loan pricing for the borrower. Marhrt-Smith argues that this is particularly the case for small firms. We empirically test the benefits of lender equity in small firms where bargaining is a feature of the setting (FL, 2021). Lender equity is shown to result in stronger market reactions, consistent with Marht-Smith (2006).

Lastly, our evidence suggests specialist banks do not show any difference in market reactions to other lenders. Likewise, there are no consistent non-bank lender effects, even partitioning between a number of non-bank lenders including government affiliated lenders.

We acknowledge the following potential limitations of our study. Firstly, the number of debt mandates where lenders take equity in project sponsors is relatively small. This may be addressed in future study where PF samples increase. Further, this study is subject to generalizability limitations in the form of a small sample of small-sized firms, confined to the development stage in the mining industry in Australia. These limitations notwithstanding, our findings suggest that further discussion of moratoriums on lenders taking equity positions in borrowers could be considered.

**Table 1 – Sample selection**

<b>Description</b>	<b>Firms</b>	<b>Projects</b>	<b>Announcements</b>
All debt mandate announcements (1995-2021)	149	156	194
Less: observations with missing stock prices	8	7	10
Final sample	141	149	184

**Table 2 – Debt mandates frequency over time**

<b>Year</b>	<b>Energy</b>	<b>Ferrous</b>	<b>Non-ferrous</b>	<b>Precious</b>	<b>Specialty</b>	<b>Various</b>	<b>Total</b>	<b>%</b>	<b>Cum. %</b>
1994	0	0	0	1	0	0	1	1%	1%
1995	0	0	1	2	0	1	4	2%	3%
1996	0	0	0	1	0	0	1	1%	3%
1997	0	0	1	1	0	0	2	1%	4%
1998	0	0	2	0	0	0	2	1%	5%
1999	0	0	1	0	0	1	2	1%	7%
2000	0	0	1	0	0	0	1	1%	7%
2001	1	0	1	3	0	0	5	3%	10%
2002	0	0	0	1	0	1	2	1%	11%
2003	0	0	0	4	0	1	5	3%	14%
2004	0	0	2	2	1	0	5	3%	16%
2005	2	0	3	5	2	2	14	8%	24%
2006	1	0	3	1	2	3	10	5%	29%
2007	0	1	2	3	1	1	8	4%	34%
2008	0	0	3	5	1	2	11	6%	40%
2009	0	0	3	5	1	0	9	5%	45%
2010	1	1	3	1	0	1	7	4%	48%
2011	2	0	5	4	2	1	14	8%	56%
2012	5	0	4	3	3	1	16	9%	65%
2013	0	0	4	2	0	1	7	4%	68%
2014	0	0	2	3	0	0	5	3%	71%
2015	1	0	3	3	5	0	12	7%	78%
2016	2	0	0	0	0	0	2	1%	79%
2017	0	0	2	2	2	1	7	4%	83%
2018	0	0	4	1	5	1	11	6%	89%
2019	0	0	2	0	10	0	12	7%	95%
2020	0	0	1	1	6	1	9	5%	100%
<b>Total</b>	<b>15</b>	<b>2</b>	<b>53</b>	<b>54</b>	<b>41</b>	<b>19</b>	<b>184</b>	<b>100%</b>	<b>-</b>

This table reports the distribution of debt mandate announcements per commodity type across the sample period 1994–2020.

**Table 3 – Debt mandates project location**

<b>Country</b>	<b>Energy</b>	<b>Ferrous</b>	<b>Non-ferrous</b>	<b>Precious</b>	<b>Specialty</b>	<b>Various</b>	<b>Total</b>	<b>%</b>
Argentina	1	0	0	0	1	0	2	1.1%
Australia	4	2	20	21	21	11	79	42.9%
Botswana	0	0	1	1	0	0	2	1.1%
Brazil	0	0	2	2	1	0	5	2.7%
Burkina Faso	0	0	1	1	0	0	2	1.1%
Cameroon	0	0	2	0	0	0	2	1.1%
Chile	0	0	4	0	0	0	4	2.2%
China	1	0	0	1	0	0	2	1.1%
Congo	0	0	4	0	0	0	4	2.2%
Denmark	0	0	2	0	0	0	2	1.1%
Egypt	0	0	0	2	4	0	6	3.3%
Ghana	0	0	0	3	0	0	3	1.6%
Indonesia	0	0	5	3	0	0	8	4.3%
Malaysia	0	0	3	1	0	0	4	2.2%
Mongolia	2	0	0	0	0	0	2	1.1%
Others	1	0	4	3	5	2	15	8.2%
Papua New G.	0	0	0	5	1	0	6	3.3%
Philippines	0	0	0	4	0	5	9	4.9%
Senegal	0	0	0	3	1	0	4	2.2%
South Africa	3	0	0	2	0	0	5	2.7%
Spain	1	0	0	0	1	0	2	1.1%
Tanzania	0	0	0	0	4	0	4	2.2%
United Kingdom	1	0	0	0	1	0	2	1.1%
United States	1	0	2	0	1	0	4	2.2%
Vietnam	0	0	1	2	0	1	4	2.2%
Zambia	0	0	2	0	0	0	2	1.1%
<b>Total</b>	<b>15</b>	<b>2</b>	<b>53</b>	<b>54</b>	<b>41</b>	<b>19</b>	<b>184</b>	<b>100.0%</b>
	<b>8.2%</b>	<b>0.01%</b>	<b>28.8%</b>	<b>29.3%</b>	<b>22.3%</b>	<b>10.3%</b>	<b>100%</b>	

This table reports the distribution of debt mandates in the sample per commodity type and project host country.

**Table 4: Identification of lender participants in debt mandates**

<b>Lender</b>	<b>Non-syndicated loans</b>	<b>Syndicated loans</b>	<b>Total</b>
Macquarie Bank	10	8	18
Standard Bank	4	9	13
Rothschild/Investec	11	2	13
Commonwealth Bank/Bankwest	8	4	12
KfW IPEX-Bank	4	5	9
RMB Resources Limited	5	4	9
Barclays	5	3	8
ANZ	5	2	7
China Development Bank	3	4	7
Credit Suisse	2	5	7
Société Générale	1	6	7
BNP Paribas	2	4	6
Nedbank	3	3	6
NAB National Australia Bank	1	3	4
Caterpillar Financial	0	3	3
Deutsche Bank AG	2	1	3
HSBC	1	2	3
International Finance Corporation	2	1	3
Standard Chartered Bank	0	3	3
WestLB AG	1	2	3
Westpac	1	2	3
African Export-Import Bank	0	2	2
Banco Santander	0	2	2
Bayerische Hypo-und Vereinsbank	1	1	2
CIB	0	2	2
European Investment Bank	0	2	2
ICBC	0	2	2
ING Bank	0	2	2
Merrill Lynch	2	0	2
Rand Merchant Bank	2	0	2
UniCredit	0	2	2
ABN AMRO	1	0	1
	86	113	199
<b>B. Nonbanks</b>			
Government-affiliated organisations	16	1	17
Investment fund	11	1	12
Industry partner	4	0	4
Equipment supplier	2	1	3
Commodity trader	2	0	2
	35	3	38

This table reports the identity of the lenders that participated in the sample of debt mandates. Panel A reports all commercial bank lenders, with each bank individually listed together with the number of deals they were involved in and their role as either sole lender/lead arranger (non-syndicated) or joint lender (syndicated). Panel

B reports the details for nonbank lenders, which are classified into government-affiliated financial institutions, investment funds, commodity trading houses, industry partners, and equipment suppliers. Since multiple lenders can participate in a debt mandate (i.e., a syndicated loan), the total number of participations by all lenders exceeds the total number of debt mandates in the sample.



**Table 5 - Debt mandate and firm characteristics**

<i>A: Debt mandate characteristics</i>	N	%Yes	Mean	Median	SD	Min	Max
Number of lenders	165		1.41	1.00	0.82	1.00	6.00
Loan amount (A\$ m)	110		180.65	64.39	382.24	1.92	2557.55
Loan/Total assets	110		7.09	1.86	17.94	0.10	109.63
GPU	184		7.32	7.33	1.24	4.33	9.50
GPU_LAW	184		4.40	5.00	1.35	2.00	6.00
GPU_INV	184		9.59	10.00	2.07	5.00	12.00
GPU_GOV	184		7.95	7.50	1.84	4.50	11.00
Remandate	184	18.5%					
Joint venture	184	19.6%					
Foreign	184	57.1%					
Syndication	184	31.5%					
Lender equity	184	7.1%					
Hedging	184	19.6%					
Advisor	184	21.7%					
Nonbank lender	184	20.7%					
Specialist bank 1 (Macquarie)	184	10.0%					
Specialist bank 3 (Top 3 banks)	184	20.7					
<b><i>B: Firm characteristics</i></b>							
Volatility	184		0.06	0.05	0.05	0.02	0.46
CRB Commodity price volatility	183		0.04	0.03	0.15	-0.37	0.38
Total assets (A\$ m)	184		64.15	29.69	95.02	0.01	724.13
Market capitalization (A\$ m)	183		141.43	57.36	223.46	0.74	1071.28
Total revenue/Total assets	184		0.09	0.00	0.20	0.00	0.97
Cash/Total assets	184		0.27	0.19	0.24	0.00	0.97
Short-term debt/Total assets	184		0.04	0.00	0.19	0.00	1.71
Long-term debt/Total assets	184		0.03	0.00	0.10	0.00	0.53
Total debt/Total assets	184		0.07	0.00	0.21	0.00	1.71
Accumulated losses (A\$ m)	184		-31.59	-18.57	44.29	-279.30	44.99
Accumulated losses/Total assets	184		-1.79	-0.57	4.09	-30.84	0.34
Top 20	180		0.61	0.61	0.16	0.26	0.93
CEO shareholding	184		0.04	0.01	0.09	0.00	0.76
Director shareholding	184		0.09	0.04	0.18	0.00	1.59
CEO & Director shareholding	184		0.13	0.07	0.24	0.00	2.12
Oil and gas	184	7.1%					

**Table 6 – Sponsor firm stock price return to debt mandate announcements**

<b>Variable</b>	<b>N</b>	<b>Positive %</b>	<b>Mean</b>	<b>Median</b>	<b>SD</b>	<b>Min</b>	<b>Max</b>	<b>BMP test</b>	<b>CZ rank test</b>
CAR[0, 1]	184	68.5	0.0462	0.0184	0.0900	-0.1712	0.4092	7.7416***	5.2391***
CAR[-1, 0]	184	64.0	0.0321	0.0161	0.0856	-0.1720	0.3814	4.1625***	3.3705***
CAR[1, 1]	184	66.3	0.0431	0.0277	0.0971	-0.1659	0.4187	5.384***	3.9097***
AR(-1)	184	47.8	-0.0025	-0.0010	0.0494	-0.1585	0.2173	-0.7137***	-0.4723***
AR(0)	184	69.0	0.0359	0.0198	0.0810	-0.0952	0.4634	6.2400***	5.483***
AR(1)	184	54.4	0.0105	0.0035	0.0727	-0.2241	0.2626	2.6227***	2.2144***

This table reports the stock price reactions to firms making debt mandate announcements. (Cumulative) abnormal returns AR (CAR) based on the market-model approach are winsorised at 1% and 99%. If an announcement is made after trading hours, the next available trading day is considered as the announcement day ( $t_0$ ). BMP test is a non-parametric test based on standardised residuals corrected for event-induced changes in volatility (Boehmer, Masumeci, and Poulsen 1991). CZ rank test is based on Corrado and Zivney's (1992) non-parametric rank test corrected for event-induced changes in volatility. \*, \*\* and \*\*\* indicate significance at the 10%, 5% and 1% levels, respectively.

**Table 7 – Sponsor firm stock price return to debt mandate announcements by hedging and political risk**

*A. Hedging vs. no hedging required*

Variable	Hedging required				No hedging required				Two-sample t test
	N	%Positive	Mean	Median	N	%Positive	Mean	Median	
CAR[0, 1]	36	72.2	0.0165	0.0073	148	67.6	0.0359	0.0217	-1.5157
CAR[-1, 0]	36	63.9	0.0254	0.0151	148	64.2	0.0512	0.0225	-1.7880*
CAR[1, 1]	36	61.1	0.0193	0.0114	148	67.6	0.0489	0.0341	-1.6906*
AR(-1)	36	58.3	-0.0060	0.0016	148	45.3	-0.0017	-0.0018	-0.5258
AR(0)	36	63.9	0.0226	0.0057	148	70.3	0.0392	0.0213	-1.6057
AR(1)	36	58.3	0.0028	0.0032	148	53.4	0.0124	0.0038	-0.7667

*B. High vs low government policy risk*

Variable	High political risk				Low political risk				Two-sample t test
	N	%Positive	Mean	Median	N	%Positive	Mean	Median	
CAR[0, 1]	88	67.1	0.0241	0.0111	96	69.8	0.0395	0.0214	1.2123
CAR[-1, 0]	88	59.1	0.0428	0.0177	96	68.8	0.0492	0.0275	0.4787
CAR[1, 1]	88	63.4	0.0372	0.0277	96	68.8	0.0485	0.0300	0.7882
AR(-1)	88	45.4	-0.0047	-0.0010	96	50.0	-0.0005	-0.0006	0.5746
AR(0)	88	64.8	0.0305	0.0083	96	72.9	0.0409	0.0294	0.8780
AR(1)	88	64.8	0.0127	0.0108	96	44.8	0.0086	-0.0040	-0.3802

This table reports subsample results of the stock price reactions to firms making debt mandate announcements. (Cumulative) abnormal returns AR (CAR) based on the market-model approach are winsorised at 1% and 99%. Panel A reports market reactions by debt mandates with and without hedging required. Panel B compares debt mandates for projects hosted by countries with high vs. low political risk based on the median of the country political risk compiled by PRS Group Inc. for three components: government stability, investment profile, and law and order. The two-sample t-test is for testing the difference in mean CAR. \*, \*\* and \*\*\* indicate significance at the 10%, 5% and 1% levels, respectively.

**Table 8 – Bid-ask spread response to debt mandate announcements**

<b>Variable</b>	<b>N</b>	<b>Positive %</b>	<b>Mean</b>	<b>Median</b>	<b>SD</b>	<b>Min</b>	<b>Max</b>	<b>BMP test</b>	<b>CZ rank test</b>
CAS[0, 1]	184	38.6	-0.0492	-0.0175	0.1256	-0.8104	0.0823	-6.3403	-8.5701***
CAS[-1, 0]	184	41.3	-0.0397	-0.0114	0.1133	-0.6061	0.0803	-4.4526	-6.8721***
CAS[1, 1]	184	43.5	-0.0518	-0.0130	0.1433	-0.7477	0.1114	-4.7120	-7.7890***
AS(-1)	184	41.3	-0.0028	0.0065	0.0473	-0.2725	0.0653	-0.4832	-1.0030
AS(0)	184	63.6	-0.0363	-0.0133	0.0912	-0.6101	0.0509	-6.6239***	-6.6893***
AS(1)	184	51.1	-0.0126	-0.0012	0.0518	-0.2435	0.0776	-3.1132***	-3.4292***

*This table reports the stock price reactions based on abnormal bid-ask spread to firms making debt mandate announcements. (Cumulative) abnormal bid-ask spreads AS (CAS) based on the market-model approach are winsorised at 1% and 99%. If an announcement is made after trading hours, the next available trading day is considered as the announcement day ( $t_0$ ). BMP test is a non-parametric test based on standardised residuals corrected for event-induced changes in volatility (Boehmer, Masumeci, and Poulsen 1991). CZ rank test is based on Corrado and Zivney's (1992) non-parametric rank test corrected for event-induced changes in volatility. \*, \*\* and \*\*\* indicate significance at the 10%, 5% and 1% levels, respectively.*

**Table 9 – Determinants of market reactions to debt mandate announcements**

VARIABLES	(1)	(2)	(3)	(4)	(5)	(6)	(7)
SpBank1			0.001 (0.02)				
SpBank3				-0.005 (0.01)			
Mining					0.151** (0.06)		
Government						0.029 (0.02)	
Investment Fund							-0.031* (0.02)
GPU		0.002 (0.00)	0.002 (0.00)	0.002 (0.00)	0.004 (0.00)	0.002 (0.00)	0.002 (0.00)
JV	-0.029 (0.02)	-0.029 (0.02)	-0.029 (0.02)	-0.029 (0.02)	-0.024 (0.02)	-0.029 (0.02)	-0.028 (0.02)
LenderEq	0.048** (0.02)	0.047** (0.02)	0.047** (0.02)	0.048** (0.02)	0.051** (0.02)	0.046** (0.02)	0.055*** (0.02)
Advisor	-0.012 (0.01)	-0.012 (0.01)	-0.012 (0.01)	-0.012 (0.01)	-0.008 (0.01)	-0.013 (0.01)	-0.009 (0.01)
LogCRBVol	0.031 (0.03)	0.032 (0.03)	0.032 (0.03)	0.034 (0.04)	0.022 (0.03)	0.033 (0.04)	0.032 (0.03)
Remandate	-0.018 (0.03)	-0.018 (0.03)	-0.018 (0.03)	-0.018 (0.03)	-0.014 (0.03)	-0.019 (0.03)	-0.021 (0.03)
Oil and Gas	-0.047*** (0.01)	-0.049*** (0.01)	-0.049*** (0.01)	-0.048*** (0.01)	-0.047*** (0.01)	-0.052*** (0.01)	-0.048*** (0.01)
Volatility	0.344** (0.17)	0.345* (0.18)	0.346* (0.18)	0.341* (0.18)	0.333** (0.16)	0.306* (0.16)	0.361* (0.19)
Log(MCap)	-0.005* (0.00)	-0.005 (0.00)	-0.005 (0.00)	-0.005 (0.00)	-0.004 (0.00)	-0.005 (0.00)	-0.005 (0.00)
AccLoss/TA	-0.001	-0.001	-0.001	-0.001	-0.000	-0.001	-0.001

	(0.00)	(0.00)	(0.00)	(0.00)	(0.00)	(0.00)	(0.00)
Top 20	-0.001	0.003	0.003	0.003	-0.006	0.008	0.002
	(0.04)	(0.04)	(0.04)	(0.04)	(0.03)	(0.04)	(0.04)
MgntShdg	-0.021	-0.019	-0.019	-0.019	-0.015	-0.024	-0.020
	(0.02)	(0.02)	(0.02)	(0.02)	(0.02)	(0.02)	(0.02)
Constant	0.111*	0.089	0.088	0.092	0.058	0.089	0.098
	(0.06)	(0.07)	(0.07)	(0.07)	(0.07)	(0.08)	(0.07)
Observations	183	183	183	183	183	183	183
Adjusted R <sup>2</sup>	0.092	0.088	0.083	0.083	0.154	0.100	0.093

This table presents the estimated coefficients from the regression of the two-day cumulative market-model abnormal return  $CAR[-1, 0]$  for the pooled sample of debt mandates. *GPU* is based on the median of the country political risk (lower measure means higher risk) compiled by PRS Group Inc. for three components: government stability, law and order, and investment profile. *SpBank1* (*SpBank3*) is a binary variable for the top one (three) industry specialist bank lender(s) based on the greatest number of deals participated (1 = specialist bank lender, 0 = otherwise). *Mining* is a binary variable for non-bank lender operating in the materials industry. *Government* is a binary variable for non-bank lender affiliated to government. *Investment Fund* is a binary variable for non-bank lender classified as an investment fund. *JV* is a binary variable for projects with multiple sponsor firms (1 = yes, 0 = no). *LenderEq* is a binary variable for lender equity ownership (1 = yes, 0 = no). *Advisor* is a binary variable for financial advisor (1 = yes, 0 = no). *LogCRBVol* is natural logarithm of return on the Thomson/CoreCommodity CRB Index in the year prior to the debt mandate announcement. *Remandate* is a binary variable for projects with past debt mandates (1 = yes, 0 = no). *Oil and Gas* is a binary variable for project sponsors operating in the oil and gas industry (1 = yes, 0 = no). *Volatility* is natural logarithm of standard deviation of daily stock returns in the preceding 12 months. *Log(MCap)* is natural logarithm of market capitalization. *AccLoss/TA* is the total accumulated loss in the year prior to the debt mandate announcement scaled by total assets. *Top 20* is percentage shareholding of the top 20 shareholders. *MgntShdg* is percentage shareholding of directors and CEO. All continuous variables are winsorised at 1% and 99%. Standard errors clustered by firms are reported in parentheses. \*, \*\* and \*\*\* indicate significance at the 10%, 5% and 1% levels, respectively.

**Table 10 – Further results with loan size**

VARIABLES	(1)	(2)	(4)	(3)	(5)	(6)	(7)
SpBank1			0.002 (0.02)				
SpBank3				-0.005 (0.01)			
Mining					0.164*** (0.06)		
Government						0.030 (0.02)	
Investment Fund							-0.029* (0.02)
Loan Disclosure		0.009 (0.01)	0.009 (0.01)	0.009 (0.01)	0.019 (0.01)	0.011 (0.01)	0.007 (0.01)
GPU		0.003 (0.00)	0.003 (0.00)	0.003 (0.00)	0.004 (0.00)	0.003 (0.00)	0.002 (0.00)
JV	-0.029 (0.02)	-0.026 (0.02)	-0.026 (0.02)	-0.026 (0.02)	-0.019 (0.02)	-0.026 (0.02)	-0.026 (0.02)
LenderEq	0.048** (0.02)	0.048** (0.02)	0.047** (0.02)	0.049** (0.02)	0.053** (0.02)	0.047** (0.02)	0.055*** (0.02)
Advisor	-0.012 (0.01)	-0.013 (0.01)	-0.013 (0.01)	-0.013 (0.01)	-0.009 (0.01)	-0.014 (0.01)	-0.010 (0.01)
LogCRBVol	0.031 (0.03)	0.034 (0.03)	0.034 (0.03)	0.037 (0.04)	0.026 (0.03)	0.036 (0.04)	0.034 (0.03)
Remandate	-0.018 (0.03)	-0.016 (0.03)	-0.016 (0.03)	-0.016 (0.03)	-0.010 (0.03)	-0.018 (0.03)	-0.019 (0.03)
Oil and Gas	-0.047*** (0.01)	-0.051*** (0.01)	-0.051*** (0.01)	-0.051*** (0.01)	-0.051*** (0.01)	-0.054*** (0.01)	-0.050*** (0.01)
Volatility	0.344** (0.17)	0.349* (0.18)	0.350* (0.18)	0.345* (0.18)	0.340** (0.17)	0.309* (0.17)	0.363* (0.19)
Log(MCap)	-0.005* (0.005)	-0.005 (0.005)	-0.005 (0.005)	-0.005 (0.005)	-0.004 (0.004)	-0.005 (0.005)	-0.005 (0.005)

	(0.00)	(0.00)	(0.00)	(0.00)	(0.00)	(0.00)	(0.00)
AccLoss/TA	-0.001	-0.001	-0.001	-0.001	-0.000	-0.001	-0.001
	(0.00)	(0.00)	(0.00)	(0.00)	(0.00)	(0.00)	(0.00)
Top 20	-0.001	0.002	0.001	0.002	-0.009	0.007	0.001
	(0.04)	(0.04)	(0.04)	(0.04)	(0.03)	(0.04)	(0.04)
MgntShdg	-0.021	-0.017	-0.016	-0.016	-0.010	-0.022	-0.018
	(0.02)	(0.02)	(0.02)	(0.02)	(0.02)	(0.02)	(0.02)
Constant	0.111*	0.082	0.082	0.085	0.042	0.081	0.093
	(0.06)	(0.07)	(0.07)	(0.07)	(0.07)	(0.08)	(0.07)
Observations	183	183	183	183	183	183	183
Adjusted R <sup>2</sup>	0.092	0.086	0.080	0.081	0.161	0.099	0.090

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**Table 11 – Further results adding bridge loans**

VARIABLES	(1)	(2)	(4)	(3)	(5)	(6)	(7)
SpBank1			-0.005 (0.01)				
SpBank3				-0.001 (0.02)			
Mining					0.150** (0.06)		
Government						0.027 (0.02)	
Investment Fund							-0.033** (0.02)
GPU		0.002 (0.00)	0.002 (0.00)	0.002 (0.00)	0.003 (0.00)	0.002 (0.00)	0.002 (0.00)
JV	-0.029 (0.02)	-0.028 (0.02)	-0.029 (0.02)	-0.029 (0.02)	-0.024 (0.02)	-0.028 (0.02)	-0.027 (0.02)
LenderEq	0.047** (0.02)	0.046** (0.02)	0.047** (0.02)	0.047** (0.02)	0.051** (0.02)	0.045** (0.02)	0.055*** (0.02)
Advisor	-0.011 (0.01)	-0.011 (0.01)	-0.011 (0.01)	-0.011 (0.01)	-0.007 (0.01)	-0.012 (0.01)	-0.008 (0.01)
LogCRBVol	0.033 (0.03)	0.033 (0.03)	0.035 (0.04)	0.033 (0.03)	0.023 (0.03)	0.034 (0.03)	0.033 (0.03)
Remandate	-0.019 (0.03)	-0.018 (0.03)	-0.018 (0.03)	-0.018 (0.03)	-0.014 (0.03)	-0.020 (0.03)	-0.021 (0.03)
Oil and Gas	-0.038*** (0.01)	-0.039*** (0.01)	-0.039*** (0.01)	-0.039*** (0.01)	-0.037** (0.02)	-0.042*** (0.02)	-0.039*** (0.01)
Volatility	0.334* (0.17)	0.335* (0.18)	0.330* (0.18)	0.334* (0.18)	0.322* (0.16)	0.297* (0.16)	0.352* (0.19)
Log(MCap)	-0.006* (0.00)	-0.005* (0.00)	-0.006* (0.00)	-0.005* (0.00)	-0.004 (0.00)	-0.006* (0.00)	-0.006* (0.00)
AccLoss/TA	-0.000	-0.000	-0.000	-0.000	-0.000	-0.000	-0.001

	(0.00)	(0.00)	(0.00)	(0.00)	(0.00)	(0.00)	(0.00)
Top 20	0.002	0.006	0.006	0.006	-0.004	0.010	0.004
	(0.04)	(0.04)	(0.04)	(0.04)	(0.03)	(0.04)	(0.04)
MgntShdg	-0.021	-0.019	-0.018	-0.019	-0.015	-0.024	-0.020
	(0.02)	(0.02)	(0.02)	(0.02)	(0.02)	(0.02)	(0.02)
Constant	0.121**	0.100	0.103	0.100	0.071	0.101	0.110
	(0.06)	(0.07)	(0.07)	(0.07)	(0.07)	(0.08)	(0.07)
Observations	188	188	188	188	188	188	188
Adjusted R <sup>2</sup>	0.082	0.078	0.073	0.073	0.142	0.088	0.084

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**Table 12 - Further results adding smelter projects**

	(1)	(2)	(3)	(4)	(5)	(6)	(7)
SpBank1			0.001 (0.02)				
SpBank3				-0.006 (0.01)			
Ind Partner					0.152** (0.06)		
Gov Affiliated						0.030 (0.02)	
Inv Fund							-0.022 (0.02)
GPU		0.002 (0.00)	0.002 (0.00)	0.002 (0.00)	0.004 (0.00)	0.002 (0.00)	0.002 (0.00)
JV	-0.032* (0.02)	-0.031* (0.02)	-0.031* (0.02)	-0.031* (0.02)	-0.027 (0.02)	-0.031* (0.02)	-0.031* (0.02)
LenderEq	0.048** (0.02)	0.047** (0.02)	0.046** (0.02)	0.048** (0.02)	0.051** (0.02)	0.046** (0.02)	0.052** (0.02)
Advisor	-0.011 (0.01)	-0.011 (0.01)	-0.011 (0.01)	-0.011 (0.01)	-0.007 (0.01)	-0.013 (0.01)	-0.009 (0.01)
LogCRBVol	0.032 (0.03)	0.032 (0.03)	0.032 (0.03)	0.035 (0.04)	0.022 (0.03)	0.034 (0.03)	0.032 (0.03)
Remandate	-0.016 (0.03)	-0.016 (0.03)	-0.016 (0.03)	-0.016 (0.03)	-0.012 (0.03)	-0.018 (0.03)	-0.018 (0.03)
Oil and Gas	-0.047*** (0.01)	-0.049*** (0.01)	-0.049*** (0.01)	-0.049*** (0.01)	-0.047*** (0.01)	-0.052*** (0.01)	-0.049*** (0.01)
Volatility	0.246** (0.12)	0.248** (0.12)	0.248** (0.12)	0.244** (0.12)	0.240** (0.11)	0.224** (0.11)	0.253** (0.13)
Log(MCap)	-0.006** (0.00)	-0.005* (0.00)	-0.005* (0.00)	-0.006* (0.00)	-0.004* (0.00)	-0.006* (0.00)	-0.006* (0.00)
AccLoss/TA	-0.001	-0.001	-0.001	-0.001	-0.000	-0.001	-0.001

	(0.00)	(0.00)	(0.00)	(0.00)	(0.00)	(0.00)	(0.00)
Top20	-0.001	0.003	0.003	0.003	-0.007	0.007	0.001
	(0.04)	(0.04)	(0.04)	(0.04)	(0.03)	(0.04)	(0.04)
MgntShdg	-0.020	-0.017	-0.017	-0.017	-0.013	-0.023	-0.018
	(0.02)	(0.02)	(0.02)	(0.02)	(0.02)	(0.02)	(0.02)
Constant	0.126**	0.103	0.102	0.106	0.072	0.102	0.111
	(0.05)	(0.07)	(0.07)	(0.07)	(0.07)	(0.07)	(0.07)
Observations	187	187	187	187	187	187	187
Adjusted R <sup>2</sup>	0.084	0.080	0.074	0.075	0.146	0.094	0.080

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**Table 13 - Further results controlling for noise effects**

VARIABLES	(1)	(2)	(4)	(3)	(5)	(6)	(7)
SpBank1			0.006 (0.01)				
SpBank3				-0.000 (0.01)			
Mining					0.146** (0.06)		
Government						0.025 (0.02)	
Investment Fund							-0.033** (0.02)
Noise		-0.033** (0.01)	-0.034** (0.01)	-0.033** (0.01)	-0.028** (0.01)	-0.030** (0.01)	-0.035** (0.01)
GPU		0.003 (0.00)	0.003 (0.00)	0.003 (0.00)	0.004 (0.00)	0.002 (0.00)	0.002 (0.00)
JV	-0.029 (0.02)	-0.024 (0.02)	-0.024 (0.02)	-0.024 (0.02)	-0.021 (0.02)	-0.025 (0.02)	-0.023 (0.02)
LenderEq	0.048** (0.02)	0.042* (0.02)	0.041* (0.02)	0.042* (0.02)	0.047** (0.02)	0.042* (0.02)	0.050** (0.02)
Advisor	-0.012 (0.01)	-0.015 (0.01)	-0.015 (0.01)	-0.015 (0.01)	-0.010 (0.01)	-0.015 (0.01)	-0.011 (0.01)
LogCRBVol	0.031 (0.03)	0.042 (0.04)	0.042 (0.04)	0.042 (0.04)	0.032 (0.03)	0.042 (0.04)	0.043 (0.04)
Remandate	-0.018 (0.03)	-0.018 (0.03)	-0.018 (0.03)	-0.018 (0.03)	-0.014 (0.03)	-0.020 (0.03)	-0.021 (0.03)
Oil and Gas	-0.047*** (0.01)	-0.043*** (0.01)	-0.043*** (0.01)	-0.043*** (0.01)	-0.042*** (0.01)	-0.047*** (0.01)	-0.043*** (0.01)
Volatility	0.344** (0.17)	0.333* (0.17)	0.336* (0.17)	0.333* (0.17)	0.323** (0.16)	0.300* (0.16)	0.350* (0.18)
Log(MCap)	-0.005* (0.005)	-0.005* (0.005)	-0.005* (0.005)	-0.005* (0.005)	-0.004 (0.004)	-0.006* (0.006)	-0.006* (0.006)

	(0.00)	(0.00)	(0.00)	(0.00)	(0.00)	(0.00)	(0.00)
AccLoss/TA	-0.001	-0.000	-0.001	-0.000	-0.000	-0.000	-0.001
	(0.00)	(0.00)	(0.00)	(0.00)	(0.00)	(0.00)	(0.00)
Top20	-0.001	0.008	0.007	0.008	-0.001	0.013	0.007
	(0.04)	(0.04)	(0.04)	(0.04)	(0.03)	(0.04)	(0.04)
MgntShdg	-0.021	-0.017	-0.017	-0.017	-0.013	-0.022	-0.018
	(0.02)	(0.02)	(0.02)	(0.02)	(0.02)	(0.02)	(0.02)
Constant	0.111*	0.100	0.098	0.100	0.069	0.099	0.110
	(0.06)	(0.07)	(0.07)	(0.07)	(0.07)	(0.07)	(0.07)
Observations	183	183	183	183	183	183	183
Adjusted R <sup>2</sup>	0.092	0.104	0.099	0.098	0.164	0.112	0.111

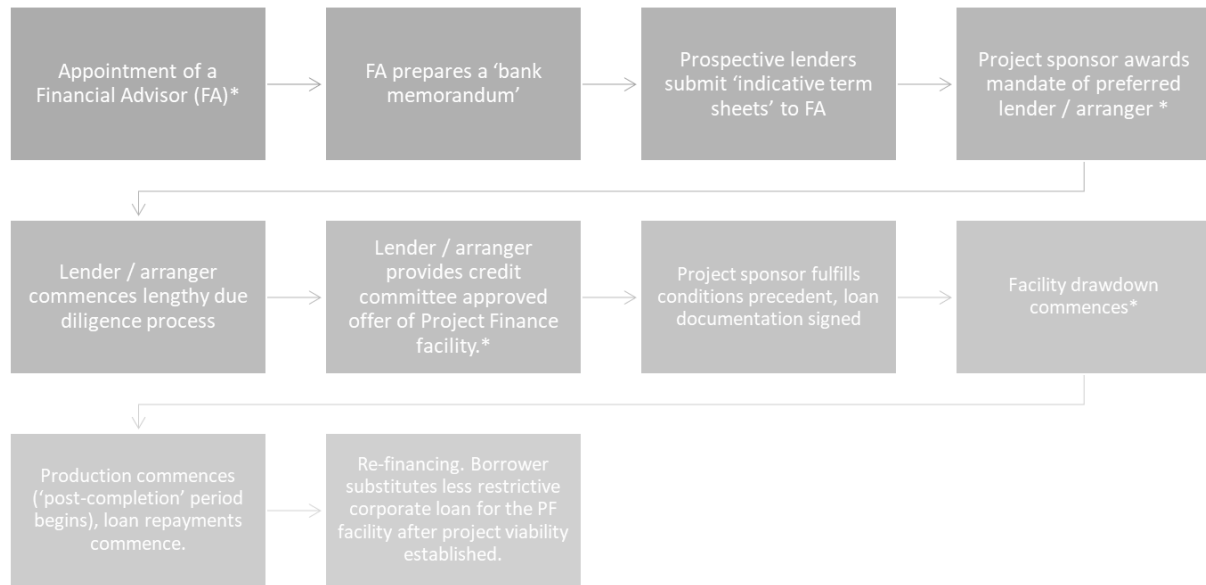
**Table 14 – Further results with hedging**

VARIABLES	(1)	(2)	(3)	(4)	(5)	(6)	(7)
SpBank1			0.019 (0.02)				
SpBank3				0.004 (0.02)			
Mining					0.143** (0.06)		
Government						0.023 (0.02)	
Investment Fund							-0.030* (0.02)
Hedging		-0.032*** (0.01)	-0.037*** (0.01)	-0.033** (0.01)	-0.026** (0.01)	-0.027** (0.01)	-0.032** (0.01)
GPU		0.002 (0.00)	0.002 (0.00)	0.002 (0.00)	0.004 (0.00)	0.002 (0.00)	0.002 (0.00)
JV	-0.029 (0.02)	-0.032* (0.02)	-0.031* (0.02)	-0.032* (0.02)	-0.027 (0.02)	-0.032* (0.02)	-0.031* (0.02)
LenderEq	0.048** (0.02)	0.056** (0.02)	0.054** (0.02)	0.055** (0.02)	0.058*** (0.02)	0.054** (0.02)	0.063*** (0.02)
Advisor	-0.012 (0.01)	-0.013 (0.01)	-0.014 (0.01)	-0.013 (0.01)	-0.009 (0.01)	-0.014 (0.01)	-0.010 (0.01)
LogCRBVol	0.031 (0.03)	0.039 (0.04)	0.040 (0.04)	0.038 (0.04)	0.029 (0.03)	0.039 (0.04)	0.039 (0.03)
Remandate	-0.018 (0.03)	-0.022 (0.03)	-0.021 (0.03)	-0.022 (0.03)	-0.017 (0.03)	-0.022 (0.03)	-0.024 (0.03)
Oil and Gas	-0.047*** (0.01)	-0.054*** (0.01)	-0.055*** (0.01)	-0.054*** (0.01)	-0.051*** (0.01)	-0.056*** (0.01)	-0.054*** (0.01)
Volatility	0.344** (0.17)	0.349** (0.17)	0.358** (0.17)	0.352** (0.17)	0.337** (0.16)	0.317** (0.16)	0.364** (0.18)
Log(MCap)	-0.005* (0.002)	-0.006* (0.002)	-0.005* (0.002)	-0.006* (0.002)	-0.004 (0.002)	-0.006* (0.002)	-0.006* (0.002)

	(0.00)	(0.00)	(0.00)	(0.00)	(0.00)	(0.00)	(0.00)
AccLoss/TA	-0.001	-0.000	-0.000	-0.000	-0.000	-0.000	-0.000
	(0.00)	(0.00)	(0.00)	(0.00)	(0.00)	(0.00)	(0.00)
Top20	-0.001	0.016	0.015	0.017	0.005	0.019	0.015
	(0.04)	(0.04)	(0.04)	(0.04)	(0.03)	(0.04)	(0.04)
MgntShdg	-0.021	-0.025	-0.024	-0.025	-0.020	-0.028	-0.025
	(0.02)	(0.02)	(0.02)	(0.02)	(0.02)	(0.02)	(0.02)
Constant	0.111*	0.102	0.098	0.100	0.071	0.101	0.111
	(0.06)	(0.08)	(0.08)	(0.08)	(0.07)	(0.08)	(0.08)
Observations	183	183	183	183	183	183	183
Adjusted R <sup>2</sup>	0.092	0.105	0.104	0.100	0.163	0.110	0.110



## Appendix A – Phases of a Mining Project Finance Loan



## Appendix B – Example of project finance debt mandate



DANAKALI

Announcement

Thursday, 6 December 2018

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# US\$200m debt finance mandate executed

- Debt finance mandate executed following signing of US\$200M term sheet
- African development financial institutions Afreximbank and AFC will act as Mandated Lead Arrangers

Danakali Limited (ASX: DNK, LSE: DNK) (**Danakali** or the **Company**) is pleased to announce that the Colluli Mining Share Company (**CMSC**) has executed a mandate to provide fully underwritten debt finance facilities of US\$200M to fund the construction and development of the Colluli Potash Project (**Colluli** or the **Project**) in Eritrea, East Africa (**Mandate**). African development financial institutions (**DFIs**) African Export-Import Bank (**Afreximbank**) and Africa Finance Corporation (**AFC**) will act as the Mandated Lead Arrangers. The Mandate follows the signing of a US\$200M non-binding indicative term sheet (**Term Sheet**).

The execution of the Mandate is a critical project financing and execution milestone. Afreximbank and AFC are highly reputable African DFIs with extensive experience in providing project financing to African projects across the continent and were chosen as Mandated Lead Arrangers due to their extensive African project finance experience and the strength of their investor reach. In 2017 Afreximbank was lead / co-lead arranger on 11 syndicated debt transactions totalling over US\$3Bn. In the same period AFC was mandated on over US\$1Bn of transactions.

Once the remaining aspects of due diligence are finalised and preconditions satisfied the Mandated Lead Arrangers will proceed to credit approval and execution of the syndicated loan facility with CMSC (**Facility**). Drawdown will follow after satisfaction of the conditions precedent to be agreed in the Facility. See Appendix A for a Colluli debt funding process overview.

**Chief Financial Officer of Danakali, Stuart Tarrant** said: *“The execution of the Mandate represents a significant milestone for the Colluli project funding. We are very pleased to be partnering with strong, experienced African financial institutions. Initial bank due diligence and subsequent negotiations have significantly advanced the project financing process and built on the finalisation of the binding offtake agreement with EuroChem placing CMSC in strong position to advance the Colluli Project.”*

Endeavour Financial is acting as debt financial adviser to Danakali and CMSC.

## About Afreximbank



Afreximbank is the foremost Pan-African multilateral financial institution devoted to financing and promoting intra- and extra-African trade. The Bank was established in October 1993 by African governments, African private and institutional investors, and non-African investors. Afreximbank's mission is to stimulate a consistent expansion, diversification and development of African trade while operating as a first class, profit-oriented, socially responsible financial institution and a centre of excellence in African trade matters. Afreximbank have won numerous awards for their work.

For more information, visit <https://afreximbank.com/>.

## About AFC



AFC is a private sector-led investment bank and development finance institution created to help mobilise and channel required capital towards driving Africa's economic development. AFC offers a unique value proposition as an Africa-focused multilateral financial institution covering 3 complementary service areas: project development, financial advisory and principal investing. In addition to these core services AFC has significant experience and expertise in project management and will ensure that the objectives of all parties involved are met through careful monitoring of the project from beginning to end. AFC's core mission is to address Africa's infrastructure development needs while seeking a competitive return on capital for its shareholders.

For more information, visit <http://www.africafc.org>.

For more information, please contact:

### Danakali

Seamus Cornelius  
Executive Chairman  
+61 8 6315 1444

William Sandover  
Head of Corporate Development & External Affairs  
+61 499 776 998

### Corporate Broker – Numis Securities

John Prior / Matthew Hasson / James Black /  
Paul Gillam  
+44 (0)20 7260 1000

### UK IR/PR – Instinctif Partners

David Simonson / George Yeomans /  
Sarah Hourahane [danakali@instinctif.com](mailto:danakali@instinctif.com)  
+44 (0)207 457 2020

## Appendix A: Colluli debt funding process overview

### Debt milestones completed

	Date	Area	Detail
✓	Jan-18	Technical reports	• FEED completed and provided to potential debt financiers
✓	Feb-18	Formal kick-off	• Information Memorandum provided to potential debt financiers
✓	Feb-18	Due diligence	• Independent Marketing Report provided to potential debt financiers
✓	Jun-18	Due diligence	• Independent Social & Environmental and Technical Engineer Reports provided to potential debt financiers
✓	Jul-18	Due diligence	• Legal Due Diligence Report provided to potential debt financiers
✓	Jun-18	Offtake	• EuroChem offtake agreement provided to potential debt financiers
✓	Jul-18	Due diligence	• Bank club and Eritrea Government discussions
✓	Sep-18	Project contracts	• DRA Global (DRA) confirmed as preferred EPCM contractor
✓	Dec-18	Term Sheet	• Finalisation and execution of debt funding term sheet
✓	Dec-18	Mandate	• Afreximbank and AFC confirmed as Mandated Lead Arrangers

### Debt milestones remaining

Area	Detail
Project contracts	• Finalisation of contracts with DRA, Inglett & Stubbs International, and preferred mining contractor
Commitments	• Final credit approval from debt financiers
Commitments	• Execution of the Facility Agreement and related documents
Commitments	• Financial Close with conditions precedent met

— — — ENDS — — —

## About Danakali

Danakali Limited (ASX: DNK, LSE: DNK) (**Danakali**, or the **Company**) is an ASX- and LSE-listed potash company focused on the development of the Colluli Potash Project (**Colluli** or the **Project**). The Project is 100% owned by the Colluli Mining Share Company (**CMSC**), a 50:50 joint venture between Danakali and the Eritrean National Mining Corporation (**ENAMCO**).

The Project is located in the Danakil Depression region of Eritrea, East Africa, and is ~75km from the Red Sea coast, making it one of the most accessible potash deposits globally. Mineralisation within the Colluli resource commences at just 16m, making it the world's shallowest potash deposit. The resource is amenable to open pit mining, which allows higher overall resource recovery to be achieved, is generally safer than underground mining, and is highly advantageous for modular growth.

The Company has completed a Front End Engineering Design (**FEED**) for the production of potassium sulphate, otherwise known as **SOP**. SOP is a chloride free, specialty fertiliser which carries a substantial price premium relative to the more common potash type; potassium chloride (or **MOP**). Economic resources for production of SOP are geologically scarce. The unique composition of the Colluli resource favours low energy input, high potassium yield conversion to SOP using commercially proven technology. One of the key advantages of the resource is that the salts are present in solid form (in contrast with production of SOP from brines) which reduces infrastructure costs and substantially reduces the time required to achieve full production capacity.

The resource is favourably positioned to supply the world's fastest growing markets. A binding take-or-pay offtake agreement has been confirmed with EuroChem Trading GmbH (**EuroChem**) for up to 100% (minimum 87%) of Colluli Module I SOP production.

The Company's vision is to bring Colluli into production using the principles of risk management, resource utilisation and modularity, using the starting module (**Module I**) as a growth platform to develop the resource to its full potential.

### Competent Persons Statement (Sulphate of Potash and Kieserite Mineral Resource)

Colluli has a JORC-2012 compliant Measured, Indicated and Inferred Mineral Resource estimate of 1,289Mt @ 11% K<sub>2</sub>O Equiv. and 7% Kieserite. The Mineral Resource contains 303Mt @ 11% K<sub>2</sub>O Equiv. and 6% Kieserite of Measured Resource, 951Mt @ 11% K<sub>2</sub>O Equiv. and 7% Kieserite of Indicated Resource and 35Mt @ 10% K<sub>2</sub>O Equiv. and 9% Kieserite of Inferred Resource.

The information relating to the Colluli Mineral Resource estimate is extracted from the report entitled "Colluli Review Delivers Mineral Resource Estimate of 1.289Bt" disclosed on 25 February 2015 and the report entitled "In excess of 85 million tonnes of Kieserite defined within Colluli Project Resource adds to multi agri-commodity potential" disclosed on 15 August 2016, which are available to view at [www.danakali.com.au](http://www.danakali.com.au). The Company confirms that it is not aware of any new information or data that materially affects the information included in the original market announcement and, in the case of estimates of Mineral Resources or Ore Reserves, that all material assumptions and technical parameters underpinning the estimates in the relevant market announcement continue to apply and have not materially changed. The Company confirms that the form and context in which the Competent Person's findings are presented have not been materially modified from the original market announcement.

### Competent Persons Statement (Sulphate of Potash Ore Reserve)

Colluli Proved and Probable Ore Reserve is reported according to the JORC Code and estimated at 1,100Mt @ 10.5% K<sub>2</sub>O Equiv. The Ore Reserve is classified as 285Mt @ 11.3% K<sub>2</sub>O Equiv. Proved and 815Mt @ 10.3% K<sub>2</sub>O Equiv. Probable. The Colluli SOP Mineral Resource includes those Mineral Resources modified to produce the Colluli SOP Ore Reserves.

The information relating to the January 2018 Colluli Ore Reserve is extracted from the report entitled "Colluli Ore Reserve update" disclosed on 19 February 2018 and is available to view at [www.danakali.com.au](http://www.danakali.com.au). The Company confirms that it is not aware of any new information or data that materially affects the information included in the original market announcement and, in the case of estimates of Mineral Resources or Ore Reserves, that all material assumptions and technical parameters underpinning the estimates in the relevant market announcement continue to apply and have not materially changed. The Company confirms that the form and context in which the Competent Person's findings are presented have not been materially modified from the original market announcement.

### Competent Persons Statement (Rock Salt Mineral Resource)

Colluli has a JORC-2012 compliant Measured, Indicated and Inferred Mineral Resource estimate of 347Mt @ 96.9% NaCl. The Mineral Resource estimate contains 28Mt @ 97.2% NaCl of Measured Resource, 180Mt @ 96.6% NaCl of Indicated Resource and 139Mt @ 97.2% NaCl of Inferred Resource.

The information relating to the Colluli Rock Salt Mineral Resource estimate is extracted from the report entitled "+300Mt Rock Salt Mineral Resource Estimate Completed for Colluli" disclosed on 23 September 2015 and is available to view at [www.danakali.com.au](http://www.danakali.com.au). The Company confirms that it is not aware of any new information or data that materially affects the information included in the original market announcement and, in the case of estimates of Mineral Resources or Ore Reserves, that all material assumptions and technical parameters underpinning the estimates in the relevant market announcement continue to apply and have not materially changed. The Company confirms that the form and context in which the Competent Person's findings are presented have not been materially modified from the original market announcement.

### AMC Consultants Pty Ltd (AMC) independence

In reporting the Mineral Resources and Ore Reserves referred to in this public release, AMC acted as an independent party, has no interest in the outcomes of Colluli and has no business relationship with Danakali other than undertaking those individual technical consulting assignments as engaged, and being paid according to standard per diem rates with reimbursement for out-of-pocket expenses. Therefore, AMC and the Competent Persons believe that there is no conflict of interest in undertaking the assignments which are the subject of the statements.

### Quality control and quality assurance

Danakali exploration programs follow standard operating and quality assurance procedures to ensure that all sampling techniques and sample results meet international reporting standards. Drill holes are located using GPS coordinates using WGS84 Datum, all mineralisation intervals are downhole and are true width intervals.

The samples are derived from HQ diamond drill core, which in the case of carnallite ores, are sealed in heat-sealed plastic tubing immediately as it is drilled to preserve the sample. Significant sample intervals are dry quarter cut using a diamond saw and then resealed and double bagged for transport to the laboratory.

Halite blanks and duplicate samples are submitted with each hole. Chemical analyses were conducted by Kali-Umwelttechnik GmbH, Sondershausen, Germany, utilising flame emission spectrometry, atomic absorption spectroscopy and ion chromatography. Kali-Umwelttechnik (KUTEC) has extensive experience in analysis of salt rock and brine samples and is certified according to DIN EN ISO/IEC 17025 by the Deutsche Akkreditierungsstelle GmbH (DAR). The laboratory follows standard procedures for the analysis of potash salt rocks chemical analysis ( $K^+$ ,  $Na^+$ ,  $Mg^{2+}$ ,  $Ca^{2+}$ ,  $Cl^-$ ,  $SO_4^{2-}$ ,  $H_2O$ ) and X-ray diffraction (XRD) analysis of the same samples as for chemical analysis to determine a qualitative mineral composition, which combined with the chemical analysis gives a quantitative mineral composition.

### Forward looking statements and disclaimer

The information in this document is published to inform you about Danakali and its activities. Danakali has endeavoured to ensure that the information enclosed is accurate at the time of release, and that it accurately reflects the Company's intentions. All statements in this document, other than statements of historical facts, that address future production, project development, reserve or resource potential, exploration drilling, exploitation activities, corporate transactions and events or developments that the Company expects to occur, are forward looking statements. Although the Company believes the expectations expressed in such statements are based on reasonable assumptions, such statements are not guarantees of future performance and actual results or developments may differ materially from those in forward-looking statements.

Factors that could cause actual results to differ materially from those in forward-looking statements include market prices of potash and, exploitation and exploration successes, capital and operating costs, changes in project parameters as plans continue to be evaluated, continued availability of capital and financing and general economic, market or business conditions, as well as those factors disclosed in the Company's filed documents.

There can be no assurance that the development of Colluli will proceed as planned. Accordingly, readers should not place undue reliance on forward looking information. Mineral Resources and Ore Reserves have been reported according to the JORC Code, 2012 Edition. To the extent permitted by law, the Company accepts no responsibility or liability for any losses or damages of any kind arising out of the use of any information contained in this document. Recipients should make their own enquiries in relation to any investment decisions.

Mineral Resource, Ore Reserve, production target, forecast financial information and financial assumptions made in this announcement are consistent with assumptions detailed in the Company's ASX announcements dated 25 February 2015, 23 September 2015, 15 August 2016, 1 February 2017, 29 January 2018, and 19 February 2018 which continue to apply and have not materially changed. The Company is not aware of any new information or data that materially affects assumptions made.

No representation or warranty, express or implied, is or will be made by or on behalf of the Company, and no responsibility or liability is or will be accepted by the Company or its affiliates, as to the accuracy, completeness or verification of the information set out in this announcement, and nothing contained in this announcement is, or shall be relied upon as, a promise or representation in this respect, whether as to the past or the future. The Company and each of its affiliates accordingly disclaims, to the fullest extent permitted by law, all and any liability whether arising in tort, contract or otherwise which it might otherwise have in respect of this announcement or any such statement.

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