Employee Entitlements and Secured Creditors: Assessing the Effects of the Maximum Priority Proposal

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ABSTRACT

Corporate failures and consequent default on obligations have, in some circumstances, led to significant losses for employees with accumulated unpaid leave entitlements. The Australian government responded initially to this problem by implementing a government funded compensation scheme. Subsequently it announced a proposal involving legislating for seniority (maximum priority) of entitlements in corporate liquidation which has not been implemented. This paper analyses and provides quantitative estimates of the consequences of changing creditor priority in this manner. Contrary to conventional wisdom and arguments mounted in opposition to such a change, the effect on corporate funding costs would be extremely small. The paper argues that legislation to effect such a change warrants further consideration as a complement to the existing compensation scheme.

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1. Introduction

In the last decade a number of high-profile corporate insolvencies in Australia have highlighted the problems arising from significant unpaid employee entitlements on corporate balance sheets. These included Ansett Airlines, whose collapse left some 16,000 employees with an estimated $670m worth of employee entitlements unpaid (DPL, 2004), OneTel, whose 1,400 employees were owed a total of $19m in accrued entitlements, Australian mining giant Pasminco, insurance company HIH and retailer Harris Scarfe[1]. In 2003, 6661 companies entered external administration (PJCCFS, 2004, p73) and the 4590 business related personal bankruptcies in 2007/8 indicate the failure rate of unincorporated enterprises (ITSA, 2008). It has been estimated that up to 20,000 workers lose their jobs every year because of failed businesses and that, in total, employees would face about $140m a year in unpaid entitlements (DPL, 2004).

The political response to mitigating losses imposed upon employees by business failure has involved a number of steps. First, legislation has accorded employee entitlements priority over other unsecured creditors in the event of corporate insolvency. It has also (under sections 433 and 561 of the Corporations Act) given them priority over creditors with a floating charge over company assets (including a floating charge that has become fixed).[2] Second, taxpayer-funded compensation schemes have been established. Both of these actions are in line with the ILO Convention (No. 173) concerning the Protection of Workers' Claims in the Event of the Insolvency of their Employer (ILO,

[1] Other high-profile insolvencies include Patrick Stevedores, Exicom, the Sizzler Chain, Braybrook Manufacturing, Coogi, Cobar Mines, and National Parts.

[2] Noble (2001) provides an outline of developments in the legal treatment of floating charges. In the UK, a June 2005 House of Lords decision in the case of NatWest v Spectrum Paints reversed an earlier Court of

1992, Campo, 2000), to which Australia is a signatory. Third, consideration has been given to further legislation to give employee entitlements *maximum priority* (above secured creditors) in the event of corporate insolvency. The maximum priority proposal (MPP) was suggested by the Federal government in 2001, but a Parliamentary committee examining corporate insolvency in 2004 recommended its rejection.

A number of arguments have been advanced against the MPP, and a particularly influential one has been the concern expressed that its adverse impact on secured creditors would unduly affect the cost and supply of credit to business. There has, however, been no attempt to rigorously analyze or quantify such effects to substantiate such a view. That is the objective of this paper, in which we adapt well established techniques from finance theory to model changes in credit risk faced by secured creditors, and consequent changes in the cost of debt (credit spreads) to corporate borrowers, arising from the MPP. Using balance sheet data for a range of "typical" Australian listed companies, we demonstrate that the likely impact on credit spreads is generally extremely small. For those firms where a significant effect would occur, this reflects a shifting of credit risk from employees, whose unpaid entitlements place them in a role of involuntary creditors who are uncompensated for bearing credit risk, to institutional lenders better placed to manage and bear such risk. Consequently, we argue that rejection of the MPP, which has been influenced by unsubstantiated concerns about cost of debt effects, is premature.

This finding is also relevant in the broader international context, where a number of different schemes for protecting employee entitlements can be found in different

Appeals decision and ruled that floating charges (involving a requirement that receipts from the company's debtors be placed into an overdraft account at the bank) ranked behind employee entitlements.

countries, and where debate is ongoing regarding an optimal model. Johnson (2006) notes four general approaches: (a) a mandatory insurance scheme paid for by employees and employers such as that operating in China; (b) a bankruptcy maximum priority model (such as the MPP) which can be found in Mexico; (c) a bankruptcy priority model and guarantee fund, whereby some priority is accorded and a government guarantee scheme operates, as is currently the case in Australia and also in Denmark; and (d) a pure guarantee fund model such as operates in Germany.[3] Public policy design aimed at protecting employee entitlements which involves choices between alternatives such as these requires information on the likely consequences of each. This paper contributes to the assembling of such information.

In the following section of the paper, we provide more detail on the nature of employee entitlements, the framework for their protection, and the proposed MPP. We also provide an overview of the arguments advanced in opposition to the MPP. In section 3, we demonstrate how analytical credit risk models, common in the finance literature (and used by the finance sector) can be adapted to assess the likely impact of the MPP on credit spreads. Section 4 presents empirical results from such modeling, using illustrative balance sheet data for typical Australian companies. In Section 5 we provide a robustness check on these results by re-estimating the credit spread effects of the MPP using an alternative (Longstaff-Schwartz, 1995) model of credit risk. Section 6 considers other potential impacts of the MPP on credit markets while Section 7 presents conclusions.

2. Protection of Employee Entitlements and the MPP

[3] Korda-Mentha (2003) also provide information on priority accorded to employee entitlements in a number of countries.

Employee entitlements consist of claims on the employer for amounts such as unpaid wages, unused annual or long service leave entitlements, as well as contingent claims such as redundancy payments which do not accrue until the workers' employment contracts are terminated at the point of insolvency.[4] These amounts and the risk involved can be substantial from the perspective of the employee, particularly since any loss occurring through employer insolvency occurs simultaneously with loss of employment. Through employee entitlements, employees provide (perhaps unwillingly) credit to their employer as a form of working capital at an implicit interest rate unrelated to the credit risk involved (Davis and Burrows, 2003).[5]

For most employers, the amount of funding derived from this source is a relatively small proportion of the total funding of the company. Table 1 provides estimates for an illustrative sample (and average figures for a large sample) of Australian listed companies using 2003 annual report data. While in some cases, the ratio of employee entitlements to secured debt is quite large, this reflects the limited use of secured debt by those companies. As a proportion of total debt and total market value (debt plus equity) of the company, the figure is generally relatively small. For most companies, employee entitlements as a proportion of total market value are less than 3 per cent, although for some enterprises, such as those involved in provision of contract labor services, the proportion is significantly higher. It should be noted that balance sheet figures such as those reported in Table 1 do not include contingent liabilities to employees such as redundancy payments which would be triggered by insolvency.

[4] In Australia, superannuation entitlements of employees participating in a company scheme are protected separately.

Table 2 summarizes the main characteristics of the current priority treatment of creditors in an insolvency. Employee entitlements are treated as a *preferential unsecured creditor*, and there is also a ranking of priority between employee entitlement types.

The protection afforded to employee entitlements by preferential status in liquidation may have little value if the assets of the failed company are significantly less than amounts owed to secured creditors and employees. Reflecting this, the government funded and administered General Employee Entitlements & Redundancy Scheme (*GEERS*) was introduced in 2001[6]. Under this scheme, employees of insolvent firms are eligible to claim from the scheme, payments for unpaid wages, accrued annual and long service leave, pay in lieu of notice and up to eight weeks' redundancy entitlements. Payments are advanced upfront to eligible employees, subject to an annual income cap which in 2006-7 was $98,200. The government then stands in the shoes of employees to claim as a preferential creditor under s560 of the Corporations Act (2001) for the amount advanced. In 2006-07 GEERS payments were $73m to 8624 former employees of 1097 insolvent businesses while only $9.5 million was recovered from the assets of the failed businesses. Although there may be some lag between payments and recoveries, these figures indicate that employee entitlements are subject to substantial credit risk and that inevitably, any shortfalls experienced are subsidised by taxpayers. [7]

[5] Burgess, Lewer and Waring (2006) argue that this role of employees as involuntary providers of finance implies a case for an expanded role of employees in corporate governance arrangements than currently exists.

[6] GEERS replaced an earlier scheme, the Employee Entitlements Support Scheme (EESS), established in January 2000. There is a separate scheme for Ansett employees (SEESA).

[7] The figures for amounts paid out and recoveries in earlier years suggest significant taxpayer costs. $60.3 mill was paid out and $5.1m recovered in 2003-4, with subsequent year figures being $66.6m and $12m in 2004-5, $49m and $26m in 2005-6. (Source: Department of Employment and Workplace Relations, Annual Reports).

The MPP was announced by the Prime Minister on 14 September 2001, and was the subject of further government announcements outlining its intended features. Employee statutory entitlements (ie not including redundancy payments) of large companies would rank ahead of secured creditors in liquidation. Existing secured loans would be "grandfathered" until their maturity, such that the change in priority would apply only to new secured loans. The MPP was only to apply to "large" companies.

Implementation of the MPP was deferred and subjected to review in June 2004 by the Parliamentary Joint Committee on Corporations and Financial Services as part of its stocktake of Corporate Insolvency Laws. Recommendation 42 of the Committee was: "The Committee recommends that the maximum priority proposal not be adopted." (PJCCFS), 2004)

Among the reasons underpinning the Committee's recommendation was an apparent acceptance of views espoused by finance industry representatives about the adverse effects of the MPP on the corporate credit market. A number of submissions to the Committee "were concerned about the impact of the proposal on the availability of credit, commenting that it would lead to a contraction of credit. This point was reiterated numerous times." (PJCCFS, 2004, para 10.38, 175).

3. Credit Risk Modeling and the MPP

The arguments relating to the adverse impact of the MPP on the market for corporate debt are based on the assertion that its introduction will significantly increase the cost of secured debt finance for companies because of the increased credit risk associated with such loans. To assess that argument, it is necessary to analyse the

determinants of corporate debt *credit spreads*, defined as the difference between the interest rate charged to corporate borrowers and the risk free rate.

Sophisticated credit spread models have been developed by academics and finance practitioners, but before considering their predictions for the implications of the introduction of the MPP it is worth considering the issue from a somewhat simpler perspective, using available data on recovery rates on corporate debt following company failures. Moody's (2005) present data on recovery rates for US corporate bonds of differing seniority for the period 1982 to 2004. The average recovery rate for senior (secured) bonds over this period was 57% of the face value. Standard & Poor's (2004) provide information for recovery rates for the period 1998-2002. For bank debt the recovery rate is 74% and for senior secured bonds it is 46%.

It is possible to use this information to obtain a ball park, illustrative, estimate of the change in spread resulting from the MPP, by assuming risk neutrality such that the expected return on a risky bond is assumed equal to the risk free rate, as follows. Let r = 0.05 (5% p.a.) be the risk free rate of interest and consider a company which has secured debt (S) of \$15m, employee entitlements (E) of \$1m and asset value (A) of \$100m. Assume that the credit spread on a one year bond for such a company is ρ = 50 basis points (which is arguably realistic historically given its capital structure). Let v =0.57 (57%) represent the recovery rate in the event of default and p represent the probability of non-default. For a \$100 face value bond, equating the expected end of year payoff to that from a one year risk free bond gives:

$$100+r = p(100+r+\rho) +(1-p)v100$$

The implied probability of non-default is:

$$p = (100+r-100v)/(100+r+\rho -v100) = (105-57)/(105.5-57) = 48/48.5 = 0.9897.$$

Note that the amount recovered by senior creditors is 0.57x \$15m = \$8.55m. If now the employee entitlements are given seniority and recoup \$1m (i.e. 100 per cent), the recovery amount falls from \$8.55m to \$7.55m which is a recovery rate of v* = 50.33% of face value. The new credit spread ($\rho*$) can be calculated in this risk-neutral example by equating the return on the risk free bond with the expected return on the risky debt and solving for $\rho*$.[8] Hence, substituting for p, r and v* in

$$100+r = p(100+r+\rho *) +(1-p)v*100$$

gives:

$$\rho * = (105-.9897x105-.0103x50.33)/.9897 = .5690.$$

The credit spread in this simple illustration has increased from 0.50 to 0.5690 which is a 6.9 basis point increase. While this illustrative estimate ignores the role of risk aversion and uses arbitrary parameter assumptions, it is of an order of magnitude not inconsistent with results from more sophisticated credit risk models to which we now turn.

Merton (1974) developed the first model for pricing corporate liabilities and their associated credit spreads above the risk free rate of interest, using a contingent claims framework, adopting the option pricing methodology of Black and Scholes (1973). The basis of the model is that equity can be viewed as equivalent to a long position in a call option on the value of a levered firm's assets, with debt being viewed as equivalent to certain payment of the face value of debt owing at maturity plus a short position in a put option on the value of the firm's assets at maturity. The value of the firm's assets V, as

[8] Note that the probability of default has not changed, only the recovery rate.

the underlying stochastic variable, is modeled as a Geometric Brownian Motion. The value (V) and volatility (σ) of the underlying firm assets, both of which are unobservable, must necessarily be implied or estimated from the market value of equity.

Although this theory is appealing, the Merton model is based on a number of restrictive assumptions, and many subsequent models have involved relaxing one or more of these assumptions. First, a single class of debt is assumed and modeled as a pure discount bond with face value F. Second, assumptions regarding the default event include absolute adherence to priority of claims in bankruptcy, the absence of bankruptcy costs and the default event being triggered only at debt maturity (T), and only if the value of the firm's assets falls below that of the face value of liabilities (F) at that date. Third, a constant risk free interest rate is assumed.

The various credit risk models which have built upon the Merton model tend to suffer from a common problem that, on average, observed credit spreads are wider than those predicted by the models. Various explanations which have been advanced for this phenomenon include tax, liquidity and risk premia effects, where the latter may involve inability to completely diversify risk of corporate bond portfolios. (Amato and Remolana, 2003, Dignan, 2003). In practice, various modifications are made to credit risk models to calibrate their average credit spread estimates more closely to those observed in the market place. For the current purpose of comparing the changes in relative credit spreads of "within firm" changes in priority of various claims, this tendency of credit spread models to underpredict average spreads should not be a major concern. We check this in Section 5 by recalculating the effects of MPP introduction using the Longstaff-Schwartz (1995) credit risk model which, although less suitable for addressing this specific

question, is generally acknowledged as providing credit spread estimates closer to those observed in the market.

The Merton model is easily extended to the case where there is more than one category of debt with differential priority rankings in default. Figure 1 illustrates for the case where there is first ranking debt claims with face value of F_1 outstanding and second ranking debt claims with face value F_2 outstanding. First ranking creditors are fully paid if the asset value of the firm (V) exceeds F_1. If $V< F_1$, first ranking creditors receive the value of the assets and other stakeholders (second ranking creditors and shareholders) receive nothing. If there is second ranking debt claims on issue, holders of that debt receive 0 if $V<F_1$, $V-F_1$ if $F_1<V<F_1+F_2$ and are paid in full (F_2) if $V> F_1 + F_2$. As Figure 1 illustrates this is equivalent to being long a call option on the firm's assets at a strike price of F_1 and short a call option at a strike price of F_2.[9]

The value of first ranking claims outstanding (P_1) using the Merton Model is given by

$$P_1 = VN(-d_1) + F_1 e^{-rT} N(d_2) \quad (1)$$

where

$$d_1 = \frac{\ln\left(\frac{V}{F_1}\right) + \left(r + \frac{1}{2}\sigma^2\right)T}{\sigma\sqrt{T}} \quad (2)$$

and

$$d_2 = d_1 - \sigma\sqrt{T} \quad (3)$$

and N(.) is the cumulative standard normal density function.

[9] Third ranking claims with face value F_3 are, similarly, equivalent to long a call option at a strike price of F_1+F_2 and short a call option at a strike price of $F_1+F_2+F_3$.

Note that the present (book) value of the promised repayment of F_1 is F_1e^{-rT}, so that leverage (as the ratio of book value of debt to book value of debt plus market value of equity) can be defined as $L = F_1e^{-rT}/V$ (which Merton (1974) calls the "quasi-debt" ratio). Then, yield to maturity (y) on the debt and the credit spread (y-r) are calculated (using continuous compounding) as

$$y - r = \frac{\ln(\frac{F_1}{P_1})}{T} - r = -\ln[N(d_2) + N(-d_1)/L]/T \tag{4}$$

The market value (P_2) of second ranking claims of face value F_2 when first ranking claims of face value F_1 exist is given as the value of a long call (at strike price F_1) and a short call (at strike price $F_1 + F_2$),

$$P_2 = [VN(d_1) - F_1e^{-rT} N(d_2)] - [VN(d^*_1) - (F_1+F_2)e^{-rT} N(d^*_2)] \tag{5}$$

where

$$d^*_1 = \frac{\ln\left(\frac{V}{F_1 + F_2}\right) + \left(r + \frac{1}{2}\sigma^2\right)T}{\sigma\sqrt{T}} \tag{6}$$

and

$$d^*_2 = d^*_1 - \sigma\sqrt{T} \tag{7}$$

The credit spread on such debt is calculated in the same manner as shown above for first ranking claims.

The effect of the introduction of the MPP on the credit spread for secured debt (in the absence of grandfathering of priority for existing claims) can be easily derived from this simple model, by noting the change in priority rankings implied and illustrated in Table 3, Panel A. Without the MPP, secured debt with face value F_1 is the first ranking claim and the credit spread is as given in equation 4. With the MPP, employee

entitlements of face value F_2 which were previously second ranked become first ranking, and "secured" debt with face value F_1 becomes the second ranking claim. Secured debt is now equivalent to a long call option with strike price F_2 and a short call option with strike price F_1+ F_2. Making the appropriate substitutions in equations (5) – (7), the market value of secured debt after the introduction of the MPP is

$$P^{\#}_1 = [VN(d^{\#}_1) - F_2e^{-rT} N(d^{\#}_2)] - [VN(d^*_1) - (F_1+F_2)e^{-rT} N(d^*_2)] \quad (8)$$

where

$$d^{\#}_1 = \frac{\ln\left(\frac{V}{F_2}\right)+\left(r+\frac{1}{2}\sigma^2\right)T}{\sigma\sqrt{T}} \quad (9)$$

and

$$d^{\#}_2 = d^{\#}_1 - \sigma\sqrt{T} \quad (11)$$

Denoting the ratio of employee entitlements to firm value by $m = F_2e^{-rT}/V$, such that $F_2/F_1=m/L$ the new credit spread on secured debt is given by

$$y^{\#} - r = \frac{\ln(\frac{F_1}{P^{\#}_1})}{T} - r = -\ln\{m[N(d_2^*) - N(d_2^{\#})]/L + N(d_2^*) + [N(d_1^{\#}) - N(d_1^*)]/L\}/T \quad (12)$$

The impact of the MPP can then be examined by considering the difference between secured debt credit spreads post MPP ($y^{\#}$-r) and credit spreads pre MPP (y-r) for relevant parameter values reflecting characteristics of typical Australian companies.

It is well known that credit risk models such as the Merton model and extensions thereto tend to overprice bonds and thus underestimate credit spreads, relative to values observed in the debt markets. There are also characteristics of the implied term structure of yield spreads from such models which are not compatible with observed data, for a number of potential reasons. First, these problems could reflect inappropriate

assumptions of the model (such as those relating to the stochastic process for firm asset values, constancy of the risk free interest rate, or the occurrence of default only at debt maturity). Second, they could also reflect difficulties in accurately applying the model to real world data, such as the need to estimate asset value and volatility indirectly, or in mapping a complicated corporate debt structure into a single maturity zero coupon debt equivalent. Third, there may be other factors, outside the scope of the model, which impact upon debt value and observed credit spreads. Liquidity, tax issues, and an inability of investors to adequately diversify credit risk are among the factors external to the firm which have been advanced. Also relevant (and well recognized in the form of the agency problem faced by creditors) may be the effect of managerial discretion (or real options) such as ability to alter future dividend payouts or to make strategic decisions which may impact adversely upon the future value of outstanding debt. The value of such options is reflected in the current price of debt through the decisions of forward looking investors (Garbade, 1999).

Although such problems mean that the Merton model has a persistent bias in predicting the level of credit spreads, this does not mean that it will not give reasonable estimates of the marginal change in credit spread resulting from a change in important determinants of credit spreads. Since that is the objective of this paper, we proceed on that basis, and check the robustness of our results in Section 5 by re-estimating the effect of the MPP using an alternative (Longstaff-Schwartz, 1995) model of credit risk.

Before proceeding to examine empirically the effect of the MPP, it is worth noting some general implications of the analysis. First, the model generates an estimate of the "market value" of employee entitlements which will be less than the face value of

claims. While no market exists for employee entitlements, this estimate is the present value of entitlements allowing for the extent of credit risk borne by employee creditors. Second, an instantaneous change in priority will reduce the market value of secured debt and increase the "market" value of employee entitlements by equal and offsetting amounts. This occurs because the MPP simply involves a reordering of priority between these two claimants and no change in their aggregate claim on the company. Third, the credit spread of secured debt will increase to reflect the greater credit risk. If the MPP were introduced with "grandfathering" of priority, there would be no impact on currently outstanding secured debt, but new secured debt would rank third behind grandfathered debt and employee entitlements (as shown in Table 3, Panel B). It is thus likely that the credit spread on new secured debt would initially be higher than its long run equilibrium value when all grandfathered debt has matured.

4. The likely impact of the MPP on secured debt credit spreads

To derive estimates of the effect of the MPP, it is necessary to choose realistic parameter values for the inputs to the Merton model. In practice, neither firm asset value (V) nor its volatility (σ_V) are directly observable (since the market value of most debt is not observable). Both can be jointly estimated from observed data (using the market value and volatility of equity) using the call option formula for valuation of equity and the elasticity relationship between the volatilities of firm asset value and equity, as described (for example) in Hull (2003, p622). The asset volatility will be less than the equity volatility (with the gap increasing with firm leverage).The estimated firm market value will typically be slightly less than the sum of equity market value and book value of

debt, reflecting the effect of credit risk on debt value, and this gap will also increase with leverage.

For current purposes, where the objective is to obtain indicative estimates of the effect of the MPP on credit spreads for firms with a range of financial characteristics, it is not necessary to pursue this route. Instead, we take specific values for asset volatility compatible with observed equity volatilities and use the ratio of book value of debt to the sum of market value of equity and book value of debt as our measure of leverage.

To confirm that our chosen values for asset volatility are appropriate, we have calculated asset and equity volatility for the sample of 244 firms described in Table 1. The average asset volatility for firms with secured debts/assets <20% was 40.1% compared to 16.8% for firms with secured debt/assets > 40%. Overall leverage for the two groups was 28.2% and 78.2% respectively and reflected the differences in secured debt/assets for the two groups. The corresponding equity volatility figures were 53.1% and 59.8%, suggesting that firms with lower asset volatility opt for higher leverage to a degree which leads to similar risk for equity holders.[10] Based on these estimates we use an asset volatility of 30% p.a., noting that this will lead to an overestimate of the effect of the MPP on credit spreads for high leverage firms for which asset volatility is, on average, lower.

The Merton model assumes that all debt takes the form of zero coupon debt with a fixed maturity date. In practice, firms have a range of debt instruments on issue with non-zero coupon rates and differing maturities. For simplicity, and because the objective is to

[10] These average figures are unweighted by size and, hence, by giving equal weight to small, high volatility firms appear large relative to market wide equity volatility estimates (of around 20%)which weight individual figures by market capitalization and allow for less than perfect correlation in returns.

obtain indicative estimates (rather than precise values for any particular firm) we assume that all debt is zero coupon debt of a fixed maturity of 5 years.

The basic Merton model also assumes zero dividends. Adjustment for a positive dividend yield is readily accomplished by assuming a constant continuous dividend yield of q and adjusting the equity value of the firm used in the option pricing formula (as one of the components of firm value) from S to Se^{-qT}. Assuming a higher dividend yield reduces the estimated market value of debt and increases the credit spread as expected.

Table 4 gives summary information on the frequency distribution of employee entitlements/ assets and secured debt/assets for the sample of 244 firms which we have used to benchmark our estimates. It indicates that it is a relatively small proportion of firms that simultaneously have high ratios to assets of secured debt and employee entitlements. Only 1.6% of the sample have secured debt /assets > 40 percent and employee entitlements / assets > 2.5%, with mean values for these ratios of 52.3% and 5.6%, which are close to the parameter values assumed in our estimates for "high leverage" companies (in the bottom right hand cell of Table 5). Also, as noted previously, the average asset volatility of such firms is typically somewhat lower than the assumed 30% so that the estimates in Table 5 will overstate the effect of the MPP on credit spreads for these companies. At the other end of the scale, around 50% of firms have an employee entitlements/assets ratio <1.5% with an average value of around 0.6%, and just over three quarters have secured debt/asset ratios of less than 20% with an average value of around 6%. The distribution of firms in the cells of panel A of Table 4 provides a rough guide to the likely distribution of firms in the cells of Table 5.

Table 5 presents the change in credit spreads on secured debt predicted by the Merton model for a range of relevant parameter values. In interpreting those figures, it is relevant to bear in mind that any increase in credit spread (reflecting the increase in credit risk borne by secured debt holders) is matched by an increase in the risk adjusted value of employee entitlements. In essence, the implicit subsidy from employee creditors (who were bearing credit risk without compensation for such risk) has been reduced by their improved priority status. If the MPP were introduced without any grandfathering of existing priorities, there would be a transfer of wealth from secured debt holders (reflected in a fall in the market value of existing debt) to employees. Where the MPP is introduced with grandfathering, the borrowing firm is gradually faced with increased borrowing costs as new secured lenders demand a higher credit spread. In that case, the spread demanded by new secured lenders will initially overshoot the equilibrium value since they will only have third ranking priority (behind employees and grandfathered lenders) until existing secured loans have matured.

Table 5 illustrates that the likely effect of the MPP on credit spreads for most companies would be relatively minor. For companies with secured debt/assets of less than 15%, and employee entitlements/assets of less than 2% (over 60 per cent of companies in our sample) the increase in the credit spread is less than 4 basis points. (If a higher asset volatility of 40% p.a. is assumed, the credit spread increase is, however, substantially higher at 19 basis points for dividend paying companies). At the more highly levered end of the sample (secured debt/assets >40%, employee entitlements/assets >2.5%), the increases are as high as 50 basis points. Three points need to be made in relation to this. First, there is only a very small proportion of companies in

this category (<2% in our sample). Second, the asset volatility figure of 30% is probably too high for this group as discussed previously. Using a volatility figure of 20% means that the increase in credit spread for this group drops to 23 basis points. (On the other hand, increasing volatility to 40% generates estimates of an increase in spread of around 100 basis points). Third, significant changes such as this indicate that employees are currently bearing credit risk for which they are not compensated. For example, in the case in Table 5 where the credit spread increases by 58 basis points, the fair value (allowing for the risk associated with the promised payment) of employee entitlements with a book value of $5 per $100 of assets increases from $3.67 to $5.00. As this implies, the MPP effectively removes all credit risk faced by employees (or the government through its contingent liability under the GEERS), for these parameter values – and given the assumptions of the model.

In practice, it is to be expected that some credit risk of employee entitlements will remain under the MPP. Companies, particularly those not subject to capital market discipline, may continue to operate long beyond the point at which assets cease to cover liabilities, and deplete assets to the point where even the maximum priority obligations to employees are unable to be fully met. This raises the question, which we address in Section 6 of whether introduction of the MPP would have other adverse impacts upon market discipline or borrower incentives in periods of financial distress which might militate against its introduction.

5. A Robustness Check

Longstaff and Schwartz (1995) provide an alternative model to Merton (1974) for the pricing of risky debt which can be calibrated to generate estimates of credit spreads

which are more consistent with empirical data. Their model relaxes the (unrealistic) assumption that default can only occur at the maturity date of the outstanding debt, by imposing a threshold (lower) value (K) for the firm's assets (V) which, if reached, creates financial distress. In this event, default on debt occurs, corporate restructuring takes place, and creditors receive some assumed fraction (1-w) of the (maturity date) face value of the security. They also allow for a stochastic short term riskless interest rate process, and derive a closed form solution (equation 6 of their paper) for the value of a risky fixed rate discount bond.

Implementing the model requires estimates of the volatility of the firm's asset value, parameters of the interest rate process (and estimates of the price of interest rate risk and covariance between interest rates and firm asset values), the ratio of firm asset value to the threshold parameter, represented by X = V/K, and the recovery rate of creditors (1-w).

We first apply the Longstaff-Schwartz model in the absence of the maximum priority proposal for a range of parameter values representing different firm characteristics. The threshold K at which financial distress and default occurs is assumed to be equal to the face value of outstanding total debt. Credit spreads are calculated for hypothetical firms with current X values of 3, 2 and 1.5, which correspond respectively to total debt to asset values of 0.33, 0.5 and 0.67.

Since we are concerned with credit spreads on secured debt, we assume a value for the recovery rate (1-w) consistent with observed data. Various studies (although unfortunately not using Australian data) suggest a recovery rate in the order of 60 per cent or more. Altman (1992) finds a recovery rate of 0.605 for US secured debt over the

period 1985-91 and Franks and Torous (1994) find recovery rates of .801 and .864 for secured and bank debt respectively for the period 1983-90. More recent data from Moody's (2005) indicates a recovery rate for senior (unsecured) bonds over 1982-2004 of 57%, while S&P (2004) find a recovery rate of 74% for bank debt and 46% for senior secured bonds over 1998-2002. We present results for assumed recovery rates of 60% and 70% on secured debt.[11] For the other parameters, we take values similar to those used by Longstaff and Schwartz.[12]

Using these assumptions, we derive estimates of credit spreads on five year zero coupon bonds for a range of combinations of values of total debt/assets and employee entitlements/assets for each assumed value of X (which is the inverse of total leverage). These are shown in Table 6. For a hypothetical company with total leverage of 0.67, the estimated credit spread is 202 basis points for a recovery rate of 60 per cent and 150 basis points for a recovery rate of 70 per cent.

To assess the implications of the MPP we re-estimate credit spreads on secured debt using the same assumptions, but with one difference. The promotion of employee entitlements (E) above secured creditor claims (C) means that the recovery rate for secured creditors will be diluted, and the resulting lower value is used in the calculations. No other parameters change.

We assume that after the introduction of the MPP the recovery rate for employee entitlements is 100 per cent and that this amount is lost by secured creditors. The total

[11] Note that the default event is related to the value of firm assets relative to total debt, of which secured debt is only a component. The Longstaff-Schwartz model does not address the question of how recovery rates are related to the composition of debt. It might be argued that recovery rates on secured debt would be lower for higher ratios of secured /unsecured debt.

[12] Specifically, using Longstaff and Schwartz's notation, we assume a risk free interest rate of 4 per cent p.a., asset volatility of $\sigma = 20\%$ p.a., a negative correlation between interest rates and firm asset values of $\rho = -0.25$, and interest rate parameters $\alpha = 0.06$, $\beta = 1.00$ and $\eta^2 = 0.001$

amount previously recovered by secured creditors was (1-w)C. Assuming that all debt is secured, and denoting C/V = d and E/V = e, the amount recovered is now (1-w)C-E = (1-w)C – eV = (1-w)C –eC/d = (1-w – e/d)C = (1-w*)C where w* is the new recovery rate for a company with a ratio of employee entitlements to total assets of E/V.

We re-estimate the credit spreads under the new assumed recovery rates and the results are shown in Table 6. For a highly levered company (total debt/assets of 67 per cent), the increase in credit spread is estimated to be 8 basis points if employee entitlements are 1 per cent of assets, and is 40 basis points if they are 5 per cent of assets. (The initial assumed recovery rate makes little difference to the size of the increase). For less levered companies, the estimated effect of the MPP on credit spreads is correspondingly lower, and extremely small for a company with low leverage (debt/assets of 33 per cent).

While it is difficult to compare these results directly with those from the Merton model (given the use of secured debt/assets in one and total debt/assets in the other), the results are of a similar order of magnitude. This supports the conclusion of the preceding section that for "low risk" companies, the MPP would have little effect on credit spreads, while for highly levered companies with significant employee entitlements, the effect could be as much as 50 basis points – where that reflects uncompensated risk being borne by employees of those companies in their role as involuntary creditors providing finance via accrued employee entitlements.

6. The MPP and Credit Markets

The preceding analysis has indicated that the effect of the MPP upon the cost of secured borrowing would be trivial for most firms. This result reflects two factors. First,

employee entitlements are a small proportion of assets, and giving them maximum priority in liquidation would have a relatively small impact on the recovery rate (or equivalently its converse, the loss given default) of secured creditors. Second, and of particular importance, credit spreads depend upon both probability of default and loss given default. The MPP does not affect probability of default which is, in any event, relatively small for firms with relatively low leverage.

For those firms where the effect of the MPP on credit spreads is non-negligible, this reflects the current importance of uncompensated risk bearing by employee creditors of the firm (or ultimately the taxpayer through GEERS). To the extent that this is viewed as socially undesirable, implementation of the MPP would mitigate the problem, although the potential effects on the firms involved, and broader economic effects, need also to be considered.

One such issue is whether the determination of employee entitlements already reflects the level of risk involved, such that introduction of the MPP would ultimately lead to less generous terms for such entitlements in employment contracts or would induce workers in more risky firms to allow such entitlements to accrue by deferring use of such entitlements. Either of these responses seems unlikely. First, terms and conditions for accrual of employee entitlements are generally determined at a more macroeconomic or legislative level through awards than at the individual firm level. There is no evidence that perceptions of default risk associated with those obligations being met plays a role in determination of their conditions. Second, while there may be some cases where employees are aware of potential failure of their employer and accelerate use of their

entitlements (by taking leave etc), this is unlikely to be a common phenomenon, particularly since the introduction of GEERS.

A second issue concerns the general impact upon the corporate credit market arising from changing incentives and the need to monitor borrower behavior. For unsecured creditors, or those with a floating charge over company assets, who provide the majority of debt finance to companies, the MPP has no effect upon their relative status, and thus should be expected to have no impact.

For secured creditors with a fixed charge over (some of) the company's assets, the MPP introduces a new element of uncertainty regarding recovery rates (but not probability of default), because of the stochastic nature of employee entitlements. Is this a significant issue given that the recovery rate is already a stochastic variable in the absence of the MPP? At the loan assessment stage, information on the current level of entitlements should be no more difficult to obtain than information on the value of assets of the company. One concern regarding subsequent monitoring for a secured lender may be that employers facing financial distress may take actions which artificially inflate employee entitlements to the detriment of the secured lender. It is difficult to see why such a course of action would be pursued, except in cases such as where the employees involved were related to the employer, where such actions would reduce the costs of failure for the employer and associates at the expense of the secured creditors. However, to the extent that such behavior might occur, this is not a new problem introduced by the MPP, since similar incentives (to transfer losses to unsecured creditors) would still arise under the current priority structure. Legislative provisions to impede such behavior would be appropriate to offset any such problem.

Does the stochastic nature of employee entitlements create greater variability in recovery rates for secured creditors or create a need for them to undertake more intensive monitoring to ensure timely actions to place the firm into insolvency. In practice, this seems unlikely, since insolvency is likely to be triggered by inability to meet all debt obligations including those to lower ranking creditors.

Would the MPP lead to innovative financing structures designed to circumvent the priority arrangements? This seems likely, although the empirical significance is probably small. Leasing, wherein the ownership of the asset remains with the supplier rather than the user, could be encouraged at the expense of purchase funded by borrowing with a fixed charge over the asset. There is little, if any, evidence to suggest that this is a less efficient form of financing fixed assets. One benefit might be the disincentive given to lawyers and financiers to dream up innovative new financing arrangements which qualify for legislative purposes as fixed charges in insolvency (and thus have first priority) but which operate effectively as floating charges prior to financial distress.

7. Conclusion

In this paper we have applied modern finance theory techniques for modeling credit risk spreads to assess the likely impact of the maximum priority proposal for employee entitlements on the cost of secured debt for Australian companies. We find that the impact is likely to be extremely small for most companies, contrary to conventional wisdom. Underpinning that result is the relatively small size of employee entitlements in corporate balance sheets, together with the significant buffer of equity and unsecured creditors whose less preferred status provides some shield for the loss given default

(LGD) experienced by secured creditors in the event of insolvency. Also important is the fact that credit spreads also depend upon the probability of default (PD) which is not affected by the MPP. Most commentators appear to have focused upon the fact that, given default, the MPP would involve a higher LGD for secured creditors, and reacted adversely to that *ex post* effect. However, given introduction of the MPP, lenders would factor that higher LGD into credit spreads charged to borrowers implying an *ex ante* charge upon companies for taking on the risk of loss involved which is currently borne involuntarily by employees in their role as involuntary creditors.

Our results indicate that the interaction of small PDs for most borrowers with the small effect on LGD of the MPP lead to quite small changes in credit spreads for most borrowers. Where the effects are significant, the implication is that employees have been bearing credit risk associated with their entitlements for which they have not been adequately compensated.

We have also argued that other assertions about the adverse effects of the MPP on the operation of the corporate credit market are unsubstantiated. Consequently, the dismissal of the MPP as an appropriate policy initiative by the Parliamentary committee investigating corporate insolvency (PJCCFS, 2004) is premature. More generally, our results provide valuable information for policy makers internationally for the formulation of optimal policy for appropriate protection of employee entitlements. Drawing on international practice and proposals such as that of Davis and Burrows (2003), possible models include compulsory private insurance, government guarantee schemes, special priority arrangements, or requiring employers to contribute sufficient to cover their

liabilities into trust funds. Results such as those presented here can assist policy makers in cost-benefit appraisal of the merits of these various alternatives.

Table 1
Employee Entitlements and Company Financial Structure
Selected Australian Companies: 2003

This table shows employee entitlements as a percentage of various balance sheet aggregates for a selection of large and some smaller labor-intensive listed companies. Also shown are average figures for a sample of 244 listed companies selected using the following criteria: balance sheet information for 2003 and 2004 available in the IRESS database; company listed for the full financial year; exclusion of thinly traded equities (if over half of the trading days in one financial year had zero returns); exclusion of companies with no secured debts or employee entitlements; exclusion of banks and finance companies; exclusion of companies which had not been allocated a GICS industry group. Secured liabilities are estimated by (using notes to the accounts), the following: Notes, bonds, commercial paper and convertible notes; Borrowings – secured; Bank overdraft and other bank facilities; Lease liabilities and hire purchase. It is assumed that all other classes of liabilities such as provisions, trade and other creditors do not involve a fixed charge over assets and are therefore treated as unsecured for the purposes of determining priority vis a vis employee entitlements.

		Employee Entitlements as % of			Secured Debt/ Market Value
ASX Code	**Company Name**	**Secured Debt***	**Total Debt**	**Market Value (Debt + Equity)**	
	Selected companies				
CML	Coles Myer	51%	12%	4%	8%
TLS	Telstra	23%	4%	1%	5%
RIO	Rio Tinto	49%	7%	2%	4%
BHP	BHP Billiton	21%	6%	2%	8%
FOA	Foodland	5%	3%	1%	28%
AMC	Amcor	14%	5%	2%	13%
TEM	Tempo	87%	26%	12%	14%
TOL	Toll	26%	11%	3%	11%
CCL	Coca Cola Amatil	10%	5%	2%	19%
WHS	Warehouse Group	152%	7%	2%	1%
RIN	Rinker	6%	3%	1%	13%
BLD	Boral	323%	7%	3%	1%
SKE	Skilled Group	169%	26%	7%	4%
Sample of 244 listed companies					
	Mean	19.7%	6.5%	2.1%	10.6%
	Median	11.0%	3.3%	1.1%	9.6%

Source: IBIS

Table 2
Creditor Priority in Insolvency

Rank	Name	Examples	Comments
1	Secured (fixed charge)	Mortgagee	Any shortfall between obligation and asset value becomes an unsecured claim
2	Preferential Unsecured	Employee entitlements, Liquidation expenses	Liquidation expenses rank first. Accrued wages and superannuation contributions rank ahead of compensation for injury, any accrued leave entitlements and lastly retrenchment payments.
3	Secured (floating charge)	Debenture (with floating charge)	
3	Unsecured Creditors	Trade Creditors	
4	Subordinated Debt		Explicit agreement to subordination of claims is recognized
5	Shareholders		Preference shareholders rank (typically) above ordinary shareholders

Source: PJCCFS (2004)

Table 3
Changes in Priority Rankings due to the MPP

		Ranking		
	First	*Second*	*Third*	*Fourth*
Pre MPP	Secured Debt (F_1)	Employee Entitlements (F_2)	Unsecured Debt (F_3)	n.a.
Panel A: Without Grandfathering				
Post MPP	Employee Entitlements (F_2)	Secured Debt (F_1)	Unsecured Debt (F_3)	n.a.
*Panel B: With Grandfathering**				
Post MPP	Old Secured Debt	Employee Entitlements	New Secured Debt	Unsecured Debt

* until existing secured debt matures, when rankings in panel A apply.

Table 4
Relative Importance of Employee Entitlements and Secured Debt

Panel A of this table shows the percentage of firms from a sample of 244 listed firms with employee entitlements and secured debt measured as a percentage of assets falling within certain bounds. Panel B shows the mean values for employee entitlements/assets (*EE/V)* and secured debt/assets *(SD/V)* for the groups.

		Secured Debt/Assets		
		<20%	*20-40%*	*> 40%*
		Panel A: Distribution of Firms		
Employee	*<1.5%*	48.0%	8.2%	4.1%
Entitlements	*1.5-2.5%*	14.8%	2.5%	1.2%
/ Assets	*> 2.5%*	14.8%	4.9%	1.6%
		Panel B: Mean Values		
<1.5%	EE/V	0.6%	0.8%	0.6%
	SD/V	5.3%	27.0%	52.5%
1.5-2.5%	EE/V	1.9%	1.9%	2.0%
	SD/V	7.7%	26.7%	58.2%
> 2.5%	EE/V	4.2%	3.8%	5.6%
	SD/V	6.1%	29.7%	52.3%

Source: IBIS and authors' calculations

Table 5
The Effect of the MPP on secured debt credit spreads

The body of the table shows the increase in the credit spread on secured debt predicted by the Merton model following introduction of the MPP for various combinations of leverage (measured as secured debt/assets), employee entitlement/firm value ratios, and dividend yields. The assumed debt maturity is 5 years, the interest rate is 5% p.a. and the volatility of assets is 30% p.a. The initial credit spread on secured debt is also shown.

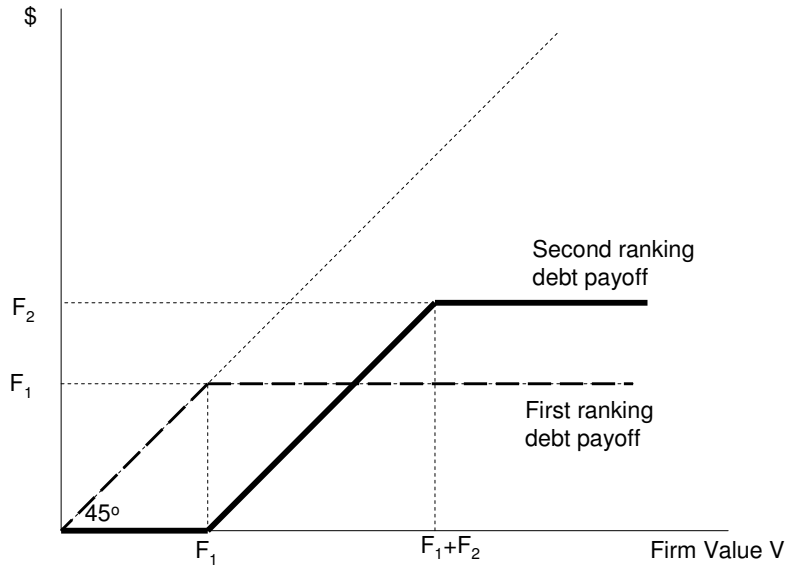
		Leverage (secured debt/assets)					
		0.15		**0.3**		**0.5**	
	Dividend yield	*0*	*0.05*	*0*	*0.05*	*0*	*0.05*
	Initial spread	*0.02%*	*0.04%*	*0.34%*	*0.45%*	*1.48%*	*1.66%*
Entitlements/Firm Value	1%	0.01%	0.02%	0.05%	0.07%	0.11%	0.12%
	2%	0.02%	0.04%	0.11%	0.14%	0.22%	0.24%
	5%	0.08%	0.12%	0.31%	0.38%	0.58%	0.63%

Table 6
Credit Spread Changes from the MPP based on the Longstaff-Schwartz Model

The body of the table shows the increase in the credit spread on secured debt predicted by the Longstaff-Schwartz model following introduction of the MPP for various combinations of leverage (measured as total debt/assets), employee entitlement/total assets ratios, and recovery rates. The assumed debt maturity is 5 years, the interest rate is 4% p.a. and the volatility of assets is 20% p.a. The initial credit spread on secured debt with the assumed initial recovery rate is also shown.

		Total Debt/Assets					
		33%		50%		67%	
	Initial Recovery rate	60%	70%	60%	70%	60%	70%
	Initial Spread	0.04%	0.03%	0.48%	0.36%	2.02%	1.50%
Entitlements/ Total Assets	1%	0.00%	0.00%	0.02%	0.02%	0.08%	0.08%
	2%	0.01%	0.01%	0.05%	0.05%	0.16%	0.16%
	5%	0.01%	0.01%	0.12%	0.12%	0.40%	0.39%

Figure 1
Debt payoffs
This figure shows the payoff, as a function of firm value, to first ranking debt holders with claims of F_1 and second ranking debt holders with claims of F_2.



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