Firing the Wrong Workers:
Financing Constraints and Labor Misallocation

Internet Appendix

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EA.1. Data

Data Universe:

Firms: Population of Swedish firms from 1998 until 2010. Source - Swedish Companies Registration Office (Bolagsverket). We standardize all firm data into January to December fiscal years by calculating monthly flow data and aggregating or by averaging stock data. Restricted to firms that: i) employ least 10 workers, ii) appear at least for 5 consecutive years in the data, and iii) with yearly workforce growth within -50% and +50%.

Workers: "Longitudinal integration database for health insurance and labor market studies" (LISA). All individuals 16 years of age and older that were registered in Sweden as of December 31 for each year.

Sectors: Data comes from SNI1992 (1990-2001), SNI2002 (2002-2010), and SNI2007 (2011) classification. Consolidated at the SNI2002 level.

Ratings: Source - UC AB. Credit scores range from 1 (least constrained) to 5 (most constrained). Risk Forecast" measures the annual probability of default of the firm. Coverage from 2001 to 2011.

International trade data: Source - Statistics Sweden. Trade type (import/export), product (8-digit classification), and country for each organization between 2000 and 2011.

Variables:

Tenure: Tenure of a worker with her current firm in years.

Fraction of workers with tenure 0-2 years: Fraction of workers with tenure below two years calculated at the firm-year level.

Short tenure: Takes value one if a worker has less than two years of tenure within the firm and zero otherwise.

Fired: Takes value one if a worker leaves the firm within the next year and receives unemployment benefits and zero otherwise.

Voluntary turnover: Takes value one if a worker is moving to a different company and does not receive any unemployment benefits in the transition period.

Firm-specific exchange rate: Exchange rate of the Swedish Krona with respect to a weighted basket of the representative currencies of the firm exports in 2000.

Shock (large): Observations within the 20% highest appreciation of their firm-specific exchange rate quantile within a year, but also in the 50% highest appreciation quantile for the whole sample in all years. Specifically $Shock\ Index_{f,t} = \sum_c \omega_{f,c,0} * e\_change_{c,t}$ where *e_change* is the change of exchange rate with currency *c* over the last year, i.e., $e\_change_{c,t} = \ln(FX_{c,t}) - \ln(FX_{c,t-1})$, and $\omega_{f,c,0}$ are fixed export weights.

Shock (small): Observations within the 20% highest appreciation of their firm-specific exchange rate quantile within a year.

Specifically, $Shock\ Index_{f,t} = \sum_c \omega_{f,c,0} * e\_change_{c,t}$, where *e_change* is the change of exchange rate with currency *c* over the last year,

i.e., $e\_change_{c,t} = \ln(FX_{c,t}) - \ln(FX_{c,t-1})$, and $\omega_{f,c,0}$ are fixed export weights.

Constrained: Categorical variable 1=gold rating (best), 2=silver rating and 3=bronze rating (worst rating). Firms with ratings below bronze rating are excluded from the sample.

Constrained 1 vs. 2 (Constrained 2 vs. 3): A dummy variable that is equal to one if the rating is silver and zero if the rating is gold (dummy variable that is equal to one if the rating is bronze and zero if the rating is silver).

High wage growth: A dummy that takes value one if the worker is above the median predicted wage growth in a regression that uses only unconstrained firms with the independent variables age minus six minus years of education (potential experience), gender, number of children, marital status, grades and program in high school and highest level of education.

Worker Wage Fixed Effect: Average worker fixed effect of a wage regression including a third order polynomial on age, firm and year fixed effects averaged at a firm level for low tenured workers (0-2 years with the firm) that are fired or stay with the firm.

EA.2. Robustness Checks

In the paper, we have pooled the average effect of dropping a rating notch between categories 1, 2 and between 2 and 3. This increases the power to estimate the effects but comes at the cost of not identifying potential heterogeneous effects. In Tables EA1 and EA2, we perform the same regressions as in Table 3, but for the individual boundaries between the gold-silver categories and the silver-bronze categories. In particular, we only

include firms with ratings 1 and 2 in Table EA1 and firms with ratings 2 and 3 in Table EA2. The results are qualitatively consistent across the two individual categories. They are also consistent with the results in Table 3, showing that our previous results are identified by both boundaries.

In quantitative terms, the effect is slightly stronger for the gold-silver threshold. This may be at odds with the fact that, in terms of interest rates, it is a less important threshold than the silver-bronze threshold. However, the gold category (equivalent to a risk free triple A rating in other rating systems) has more persistence than any of the other categories (see Table A2 in the Appendix), so being downgraded from the gold category may predict further future downgrades. For this reason, crossing the gold-silver boundary may contain more information about the long-term financial health of the firm.

In Table EA3 we replicate the analysis in Table 3, but we redefine the shock variable. The shock variable takes value 1 if the firm is in the highest appreciation quantile within a year and zero otherwise. That is, relative to our previous shock definition, we drop the condition that the shock needs to be large in absolute terms and focus only on relative differences within the year. The main advantage of this variable is that it is evenly distributed across years, so it does not capture any aggregate variation of the exchange rate of the Swedish Krona. The results in Table EA3 are consistent with those in Table 3 with, as expected, slightly smaller point estimates on the *Shock* coefficients.

In Table EA4 we perform an additional robustness check. We restrict the sample to firms that obtained the highest rating ("gold") for two years in a row and focus on the boundary between gold and silver ratings. The rationale for this specification is that firms

that transition from gold to silver rating for the first time are more likely to be surprised to be downgraded to the silver category and, hence, less likely to "manage" their rating results in the short run. The results on this subpopulation are qualitatively similar to our previous results in Table 3. However, they are quantitatively much more sizeable compared to our baseline. For instance, the estimated coefficient on the triple interaction is between two to three times larger and more precisely estimated. In other words, the firms for which a change in the rating is closest to an exogenous unexpected shock are the ones for which the pattern of results is clearer, with larger and more significant coefficients. This lends support to the identification strategies of the paper.

In Table EA5, we replace the definition of firing with stricter definitions of firing. In Columns 1 and 2 we require that workers are unemployed for at least 180 days between jobs to classify as fired. In Columns 3 and 4 we require that workers suffer a drop in income of at least 10% when changing jobs. The results under these stricter definitions of firing are stronger, relative to the baseline firing probability, than the ones in Table 3.

In Table EA6 we replace the definition of high vs low tenured workers with alternative ones. In columns 1 and 2 we define as short-tenured workers those with tenure below one year and in columns 3 and 4 we define them as those with tenure below three years. In columns 5 to 8 we exclude from the analysis those workers with tenure below one year and define short-tenure workers as 1-2 years of tenure (columns 5 and 6) and 1-3 years of tenure (columns 7 and 8). The results are qualitatively very consistent across specifications and also consistent with those in sections 6.1 and 6.2.

The possibility of hedging could make that firms are heterogeneously exposed to the exchange rate shock. This could add noise and potentially biases to our regressions. There

are some reasons to believe that this is not the case. First, our firms are relatively small (median of 27 employees), and unlikely to have access to financial derivatives to hedge their currency exposures. Second, when firms hedge against exchange rate fluctuations, they typically hedge their profits directly. If they hedge their sales, exports or imports, they hedge a notional amount of them. Hedging the actual amount of exports would require a tailor made contract that would be subject to moral hazard considerations. Given this, the operational decisions of a hedged firm ad a non-hedged firms would be the same, as the price paid/received in the margin for inputs and exports is the same for both types of firms. To show that our results are robust to the possibility of hedging, in Table EA7 we run regressions in which we exclude all firms that hold financial assets. Although we do not have more disaggregated data that show explicitly whether a firm holds derivatives, most forms of currency financial hedging should show up in the firm accounts as part of its financial assets. The results are very similar, and marginally larger on those coefficients that involve the *shock* variable. This effect could come from the absence of hedging, but also from the relatively smaller size of the firms in the restricted sample.

Table EA1: Financing Constraints and Firing (Thresholds 1 and 2)

This table estimates regressions at the worker level. The dependent variable is binary variable equal to one if the worker leaves the firm in period t and receives unemployment benefits afterwards, and zero otherwise. Shock (large) is an exchange rate shock. "Large" refers to shocks of larger appreciations, within the 20% highest appreciation quantile within a year, but also in the 50% highest appreciation quantile for the whole sample. Constrained 1 vs. 2 is a dummy that takes the value of one if the rating is 2. It is defined for firms with a rating of 1 or 2. Short-tenured is a dummy equal to one for workers with 0 to 2 years of tenure, and zero otherwise. Polynomial indicates a polynomial of order 12 of the running variable "risk forecast". Sources: SCB LISA, UC AB, Bolagsverket.*** p<0.01 ** p<0.05 * p<0.1.

	Fired Next Year			
	(1)	(2)	(3)	(4)
Short-tenure	0.070***	0.069***	0.069***	0.074***
	(0.000)	(0.000)	(0.000)	(0.000)
Shock (large)	0.002***	0.007***	0.007***	-
	(0.000)	(0.000)	(0.000)	-
Short-tenure X Shock (large)	-0.025***	-0.020***	-0.020***	-0.018***
	(0.001)	(0.001)	(0.001)	(0.001)
Constrained 1 vs. 2	0.009***	-0.005***	-0.004***	-
	(0.000)	(0.000)	(0.001)	-
Short-tenure X Constrained 1 vs. 2	0.017***	0.014***	0.014***	0.013***
	(0.001)	(0.001)	(0.001)	(0.001)
Shock (large)=1 X Constrained 1 vs. 2	-0.005***	-0.001	-0.001	-
	(0.001)	(0.001)	(0.001)	-
Short-tenure X Shock (large)=1 X Constrained 1 vs. 2	0.015***	0.013***	0.013***	0.005***
	(0.001)	(0.001)	(0.001)	(0.002)
Observations	5,203,427	5,203,427	5,203,427	5,203,427
Polynomials	No	No	Yes	No
Industry-Year fixed effects	Yes	Yes	Yes	Yes
Firm fixed effects	No	Firm	Firm	Firm-Year

Table EA2: Financing Constraints and Firing (Thresholds 2 and 3)

This table estimates regressions at the worker level. The dependent variable is binary variable equal to one if the worker leaves the firm in period t and receives unemployment benefits afterwards, and zero otherwise. Shock (large) is an exchange rate shock. "Large" refers to shocks of larger appreciations, within the 20% highest appreciation quantile within a year, but also in the 50% highest appreciation quantile for the whole sample. Constrained 2 vs. 3 is a dummy that takes the value of one if the rating is 3. It is defined for firms with a rating of 2 or 3. Short-tenured is a dummy equal to one for workers with 0 to 2 years of tenure, and zero otherwise. Polynomial indicates a polynomial of order 12 of the running variable "risk forecast". Sources: SCB LISA, UC AB, Bolagsverket. *** p<0.01 ** p<0.05 * p<0.1.

	Fired Next Year			
	(1)	(2)	(3)	(4)
Short-tenure	0.087***	0.083***	0.083***	0.087***
	(0.001)	(0.001)	(0.001)	(0.001)
Shock (large)	-0.004***	0.004***	0.004***	-
	(0.001)	(0.001)	(0.001)	-
Short-tenure X Shock (large)	-0.010***	-0.008***	-0.008***	-0.012***
	(0.001)	(0.001)	(0.001)	(0.001)
Constrained 2 vs. 3	0.004***	0.002***	-0.000	-
	(0.000)	(0.000)	(0.001)	-
Short-tenure X Constrained 2 vs. 3	-0.003***	-0.004***	-0.004***	-0.003***
	(0.001)	(0.001)	(0.001)	(0.001)
Shock (large)=1 X Rating 2 vs. 3	0.007***	-0.003***	-0.003***	-
	(0.001)	(0.001)	(0.001)	-
Short-tenure X Shock (large)=1 X Constrained 2 vs. 3	-0.004**	0.003	0.003	0.006***
	(0.002)	(0.002)	(0.002)	(0.002)
Observations	3,003,019	3,003,019	3,003,019	3,003,019
Polynomials	No	No	Yes	No
Industry-Year fixed effects	Yes	Yes	Yes	Yes
Firm fixed effects	No	Firm	Firm	Firm-Year

Table EA3: Financing Constraints and Firing (Small Shock)

This table estimates regressions at the worker level. The dependent variable is binary variable equal to one if the worker leaves the firm in period t and receives unemployment benefits afterwards, and zero otherwise. Shock (large) is an exchange rate shock. "Small" refers to shocks of larger appreciations, within the 20% highest appreciation quantile within a year. Constrained is a categorical variable equal to 1,2,3 (1=best rating, 3=worst rating). Short-tenured is a dummy equal to one for workers with 0 to 2 years of tenure, and zero otherwise. Polynomial indicates a polynomial of order 12 of the running variable "risk forecast". Sources: SCB LISA, UC AB, Bolagsverket. *** p<0.01 ** p<0.05 * p<0.1.

	Fired Next Year			
	(1)	(2)	(3)	(4)
Short-tenured	0.066***	0.066***	0.066***	0.072***
	(0.000)	(0.001)	(0.001)	(0.001)
Shock (small)	0.002***	0.010***	0.010***	-
	(0.000)	(0.001)	(0.001)	-
Short-tenured X Shock (small)	-0.027***	-0.023***	-0.022***	-0.022***
	(0.001)	(0.001)	(0.001)	(0.001)
Constrained	0.007***	-0.002***	0.000	-
	(0.000)	(0.000)	(0.001)	-
Short-tenured X Constrained	0.007***	0.005***	0.005***	0.005***
	(0.000)	(0.000)	(0.000)	(0.000)
Shock (small) X Constrained	-0.001***	-0.003***	-0.003***	-
	(0.000)	(0.000)	(0.000)	-
Short-tenured X Shock (small) X Constrained	0.005***	0.005***	0.005***	0.005***
	(0.001)	(0.001)	(0.001)	(0.001)
Observations	6887539	6,887,539	6,887,539	6,887,539
Polynomials	No	No	Yes	No
Industry-Year fixed effects	Yes	Yes	Yes	Yes
Firm fixed effects	No	Firm	Firm	Firm-Year

Table EA4: Financing Constraints and Firing (Previous Gold Firms)

This table estimates regressions at the worker level. We restrict the sample to firms that were categorized as gold rating for the previous 2 years. This table estimates regressions at the worker level. The dependent variable is binary variable equal to one if the worker leaves the firm in period t and receives unemployment benefits afterwards, and zero otherwise. Shock (large) is an exchange rate shock. "Large" refers to shocks of larger appreciations, within the 20% highest appreciation quantile within a year, but also in the 50% highest appreciation quantile for the whole sample. Constrained 1 vs. 2 is a dummy that takes the value of one if the rating is 2. It is defined for firms with a rating of 1 or 2. Short-tenured is a dummy equal to one for workers with 0 to 2 years of tenure, and zero otherwise. Polynomial indicates a polynomial of order 12 of the running variable "risk forecast". Sources: SCB LISA, UC AB, Bolagsverket. *** p<0.01 ** p<0.05 * p<0.1.

	Fired Next Year			
	(1)	(2)	(3)	(4)
Short-tenure	0.070***	0.069***	0.069***	0.073***
	(0.001)	(0.001)	(0.001)	(0.001)
Shock (large)	0.009***	0.022***	0.023***	-
	(0.001)	(0.002)	(0.002)	-
Short-tenure X Shock (large)	-0.058***	-0.046***	-0.046***	-0.032***
	(0.002)	(0.003)	(0.003)	(0.003)
Constrained 1 vs. 2	0.006***	0.002***	0.010***	-
	(0.000)	(0.001)	(0.002)	-
Short-tenure X Constrained 1 vs. 2	-0.002**	-0.000	-0.001	-0.002**
	(0.001)	(0.001)	(0.001)	(0.001)
Shock (large)=1 X Constrained 1 vs. 2	-0.007***	-0.012***	-0.013***	-
	(0.001)	(0.001)	(0.001)	-
Short-tenure X Shock (large)=1 X Constrained 1 vs. 2	0.026***	0.020***	0.020***	0.013***
	(0.002)	(0.002)	(0.002)	(0.002)
Observations	2,578,093	2,578,093	2,578,093	2,578,093
Polynomials	No	No	Yes	No
Industry-Year fixed effects	Yes	Yes	Yes	Yes
Firm fixed effects	No	Firm	Firm	Firm-Year

Table EA5: Alternative Specifications of Firing

This table estimates regressions at the worker level. In columns (1) and (2) the dependent variable is binary variable equal to 1 if the worker leaves the firm in period t and receives unemployment benefits for at least 180 days afterwards, and zero otherwise. In columns (3) and (4) the dependent variable is binary variable equal to one if the worker leaves the firm in period t, receives unemployment benefits afterwards and a cut of her disposable income of at least 10%, and zero otherwise. Shock (large) is an exchange rate shock. "Large" refers to shocks of larger appreciations, within the 20% highest appreciation quantile within a year, but also in the 50% highest appreciation quantile for the whole sample. Constrained is a categorical variable equal to 1,2,3 (1=best rating, 3=worst rating). Short-tenured is a dummy equal to one for workers with 0 to 2 years of tenure, and zero otherwise. Polynomial indicates a polynomial of order 12 of the running variable "risk forecast". Sources: SCB LISA, UC AB, Bolagsverket. *** p<0.01 ** p<0.05 * p<0.1.

	Fired Next Year			
	Days unemployed > 180d		Income cut > 10%	
	(1)	(2)	(3)	(4)
Short-tenure	0.019***	0.021***	0.031***	0.034***
	(0.000)	(0.000)	(0.000)	(0.000)
Shock (large)	0.006***	-	0.009***	-
	(0.000)	-	(0.000)	-
Short-tenure X Shock (large)	-0.010***	-0.008***	-0.015***	-0.016***
	(0.001)	(0.001)	(0.001)	(0.001)
Constrained	-0.001***	-	-0.001***	-
	(0.000)	-	(0.000)	-
Short-tenure X Constrained	0.002***	0.002***	0.001***	0.002***
	(0.000)	(0.000)	(0.000)	(0.000)
Shock (large)=1 X Constrained	-0.002***	-	-0.003***	-
	(0.000)	-	(0.000)	-
Short-tenure X Shock (large)=1 X Constrained	0.003***	0.002***	0.005***	0.005***
	(0.000)	(0.000)	(0.001)	(0.001)
Observations	6,887,539	6,887,539	6,887,539	6,887,539
Polynomials	Yes	No	Yes	No
Industry-Year fixed effects	Yes	Yes	Yes	Yes
Firm fixed effects	Firm	Firm-Year	Firm	Firm-Year

Table EA6: Alternative Specifications of Tenure

This table estimates regressions at the worker level. The dependent variable is binary variable equal to 1 if the worker leaves the firm in period t and receives unemployment benefits afterwards, and zero otherwise. Shock (large) is an exchange rate shock. "Large" refers to shocks of larger appreciations, within the 20% highest appreciation quantile within a year, but also in the 50% highest appreciation quantile for the whole sample. Constrained is a categorical variable equal to 1,2,3 (1=best rating, 3=worst rating). In columns (1) and (2) Short-tenured is a dummy equal to one for workers with 0 to 1 years of tenure, and zero otherwise (Short-tenured is 0 to 3 years in columns (3) and (4), 1 to 2 years in columns (5) and (6), and 1 to 3 years in columns (7) and (8)). We drop all workers with less than 2 years of tenure in specifications (5) to (8). Polynomial indicates a polynomial of order 12 of the running variable "risk forecast". Sources: SCB LISA, UC AB, Bolagsverket. *** p<0.01 ** p<0.05 * p<0.1.

	Fired Next Year							
	Short-tenure (0-1 years)		Short-tenure (0-3 years)		Short-tenure (1-2 years)		Short-tenure (1-3 years)	
	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)
Short-tenure	0.077***	0.083***	0.057***	0.062***	0.018***	0.023***	0.018***	0.021***
	(0.001)	(0.001)	(0.000)	(0.000)	(0.001)	(0.001)	(0.000)	(0.001)
Shock (large)	0.010***	-	0.013***	-	0.004***	-	0.006***	-
	(0.001)	-	(0.001)	-	(0.001)	-	(0.001)	-
Short-tenure X Shock (large)	-0.027***	-0.026***	-0.017***	-0.020***	-0.009***	-0.012***	-0.005***	-0.009***
	(0.001)	(0.002)	(0.001)	(0.001)	(0.001)	(0.002)	(0.001)	(0.001)
Constrained	-0.001	-	-0.002***	-	-0.001*	-	-0.001**	-
	(0.001)	-	(0.001)	-	(0.001)	-	(0.001)	-
Short-tenure X Constrained	0.005***	0.005***	0.005***	0.005***	0.003***	0.003***	0.002***	0.003***
	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)
Shock (large)=1 X Constrained	-0.003***	-	-0.003***	-	-0.001***	-	-0.002***	-
	(0.000)	-	(0.000)	-	(0.000)	-	(0.000)	-
Short-tenure X Shock (large)=1 X Constrained	0.007***	0.008***	0.004***	0.005***	0.003***	0.003***	0.001*	0.002**
	(0.001)	(0.001)	(0.001)	(0.001)	(0.001)	(0.001)	(0.001)	(0.001)
Observations	6,887,539	6,887,539	6,887,539	6,887,539	4,599,302	4,599,302	4,599,302	4,599,302
Exclude workers with tenure 0-1	No	No	No	No	Yes	Yes	Yes	Yes
Polynomials	Yes	No	Yes	No	Yes	No	Yes	No
Industry-Year fixed effects	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Firm fixed effects	Firm	Firm-Year	Firm	Firm-Year	Firm	Firm-Year	Firm	Firm-Year

Table EA7: Exclusion of Firms with Financial Assets

This table estimates regressions at the worker level. The dependent variable is binary variable equal to one if the worker leaves the firm in period t and receives unemployment benefits afterwards, and zero otherwise. We exclude workers from the sample who work for firms that have financial assets on their balance sheets. Shock (large) is an exchange rate shock. "Large" refers to shocks of larger appreciations, within the 20% highest appreciation quantile within a year, but also in the 50% highest appreciation quantile for the whole sample. Constrained is a categorical variable equal to 1,2,3 (1=best rating, 3=worst rating). Short-tenured is a dummy equal to one for workers with 0 to 2 years of tenure, and zero otherwise. Polynomial indicates a polynomial of order 12 of the running variable "risk forecast". Sources: SCB LISA, UC AB, Bolagsverket. *** p<0.01 ** p<0.05 * p<0.1.

	Fired Next Year	
	(1)	(2)
Short-tenure	0.067***	0.071***
	(0.001)	(0.001)
Shock (large)	0.012***	-
	(0.001)	-
Short-tenure X Shock (large)	-0.024***	-0.031***
	(0.001)	(0.001)
Constrained	-0.004***	-
	(0.001)	-
Short-tenure X Constrained	0.005***	0.005***
	(0.000)	(0.000)
Shock (large)=1 X Constrained	-0.003***	-
	(0.000)	-
Short-tenure X Shock (large)=1 X Constrained	0.007***	0.008***
	(0.001)	(0.001)
Observations	5,742,486	5,742,486
Polynomials	Yes	No
Industry-Year fixed effects	Yes	Yes
Firm fixed effects	Firm	Firm-Year

EA.3. Impact of UC Ratings on Interest Rates paid

It is useful to quantify the impact of changes in UC ratings on the interest rate paid by firms to put in perspective the size of the employment results. There are several useful measurements that help measuring or bounding the effect.

The first approach to measure the marginal change in interest rates is directly from the Panel A of Table A3. In columns (7), (8) and (9) we report the change in the average interest rate paid when firms experience a contemporaneous change in rating. The change is measured at the boundary of a rating change by introducing a polynomial of order 12 on the running variable. The results show an average change of 0.156% (15 basis points) for both boundaries 0.082% for the gold to silver boundary (not statistically significant) and 0.299% for the silver to bronze boundary. These are changes on the average interest rates after an unexpected (marginal) change in rating. Given that firms may have some long-term debt, the effect on the marginal interest rate should be higher.

Alternatively, one can recourse to a risk neutral valuation to measure, or place some bounds, on the effect of ratings on interest rates. Consider the following expression in which a bond of a given rating c has an expected return R_e:

$$(1+r_c)\,(1-p_c) + (1+r_c)\,p_c\,R_c = R_e$$

Where r_c is the promised rate on the debt, p_{ct} is the default probability and R_c is the recovery rate in case of default. To populate this expression, we can use as default probabilities, the average default probability in each interval (0.12% for gold, 0.47% for silver, and 1.59 for bronze), as recovery rate 35% (see Thorburn, 2000) and an expected return of 6%. This yields promised rates of 6.08% for gold, 6.32% for silver and 7.11% for bronze. That is, a yield differential of 24 basis points for the gold-silver transition and 78 basis points for the silver-bronze boundary. If we assume a zero recovery rate, the differential grows to 37 basis points and 121 basis points respectively.