

Deferred Compensation and Organizational Productivity

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As the Canadian labor market continues to undergo structural changes, an increasingly greater premium will be placed on a flexible, adaptable work force. Occupational pensions that contemplate long-term risk sharing between the parties will be a disadvantage to employees in such circumstances, increasing the importance of the other retirement saving vehicles whose benefit structure is not tied to the organization, such as defined-contribution pension plans and registered retirement savings plans. Over the past decade, while registered retirement savings plans (RRSPs) have exhibited tremendous growth, occupational pension plans generally, and defined-benefit (DB) plans in particular, have been in decline. The decline of DB plans and growth in more flexible savings plans in other countries such as the United States has been equally, if not more pronounced, spurring interest in the labor market implications of these trends. Although trends toward greater portability under the RRSP would increase retirement savings for increasingly more mobile workers, the reduced incentives for longer tenure may have negative productivity consequences. In particular, these trends may lead to increased quits and layoffs, increased expenditures on training and development, and reduced incentives for work effort and labor-management cooperation, affecting the wealth base of society more generally. To date, empirical study has neither comprehensively assessed the productivity enhancement features of DB plans nor provided a strong test of their labor market impact in comparison to other deferred compensation arrangements such as defined-contribution (DC) plans and

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group RRSPs. The research that has been done so far does not adequately compare experiences under different types of plans (e.g., DB plans, DC plans, and group RRSPs). Also, although some research has been supportive of a productivity enhancing rationale for pensions, there are reasons to question the validity of this relationship. This study makes use of the 1999 and 2000 Workplace and Employee Surveys (WESs), which allow us to distinguish the effects of alternative systems of deferred compensation on different mechanisms for increasing organisational productivity. Implications for pension theory, research, and practice will also be discussed.

Introduction

As the labor force ages and the baby boom reaches retirement ages, as the viability of public pensions is questioned, and as career jobs are replaced by portfolios of jobs, the structure of private retirement savings arrangements takes on increased importance. The two major private retirement savings vehicles in Canada today are the occupational pension plan and registered retirement savings plan (RRSP), which covered 41 percent and 50 percent of paid workers in 1999, respectively (Statistics Canada 2001). Although both plans offer a tax-assisted method for accumulating retirement savings, they are structured in very different ways. The most common pension plan, representing more than 85 percent of all plan members in Canada, provides a defined-benefit that defers increasingly larger amounts of employees' retirement savings until later in their careers, creating well-known incentives for long job tenure and retirement choices. The RRSP, on the other hand, is more akin to a retirement savings account that is not structured to defer savings in this way. In other words, unlike most forms of pension plans, the choice of an employee to quit or retire is not connected with a penalty of for-gone retirement wealth under an RRSP.

Over the past decade, whereas RRSPs have exhibited tremendous growth, pension plans in general, and defined-benefit (DB) plans in particular, have been in decline. The decline of DB plans and growth in more flexible savings plans in other countries such as the United States has been equally, if not more, pronounced, spurring interest in implications of these trends on labor market, employment relations, and human resource management (Ippolito 1995). Although trends toward greater portability under RRSPs would increase retirement savings for increasingly more mobile workers, the reduced incentives for longer tenure may have negative productivity consequences. In particular, these trends may lead to increased turnover and layoffs, increased expenditures on training and development, and reduced incentives for work effort and labor-management cooperation, which affect the wealth base of society more generally.

To date, no empirical study has comprehensively assessed the productivity enhancing features of DB plans or provided a strong test of their labor market impact in comparison to other deferred compensation arrangements. Also, although some research has been supportive of a productivity enhancing rationale for pensions, there are reasons to question the validity of this relationship. This study makes use of the 1999 and 2000 Workplace and Employee Surveys (WESs), which allow us to distinguish the effects of alternative systems of deferred compensation on different mechanisms for increasing organisational productivity. We find both pensions and RRSPs to have productivity enhancing effects but for different reasons. Implications for pension theory, research, and practice are discussed.

Productivity Views of Pensions and Group RRSPs

There are three major hypotheses that help explain the links between deferred compensation and organizational productivity: the implicit contract and joint investment in training model; the principal-agent, or “shirking,” model; and the information asymmetry of selection/hiring model (Dorsey, Cornwell, and Macpherson, 1998). These models differ in the breadth of explanatory power of the pension-productivity relationship.

Implicit Contract and Firm-Specific Training

According to this theory, pension plans in general, and DB plans in particular, help employers enforce long-term employment relationships by imposing a penalty on those who quit prematurely, because many jobs involve significant hiring costs and require training in production that is not transferable to another firm (Allen and Clark 1985; Ippolito 1987, 1994; Michell 1988; Lazear 1990; Gustman, Mitchell, and Steinmeier 1994; and Dorsey 1995). The firm-specific training complements most implicit contract models, because these fixed costs generate rents that both parties can benefit from preserving. Hall (1980) called it the “glue” that holds workers and firms together.

This rent-sharing mechanism, however, can create other problems, such as “hold up.” When information is asymmetric, excessive quits and layoffs may be inevitable. Becker (1964) suggested that unvested pensions may serve the economic functions against firm-specific capital losses due to employee-initiated separations (quits). Firms are more likely to share the costs and benefits of training if it is feasible to establish a severance tax (pension capital loss) to discourage opportunistic bargaining or quits. That pensions facilitate productivity gains by encouraging workers and firms to invest in firm-specific training has been a classic implication on the economics of pensions.

The implicit contract/training model also provides a rationale for retirement incentives for pensions. In the absence of mandatory retirement, and

assuming nominal wages to be downwardly inflexible, severance payments are needed to induce older workers to retire voluntarily when their productivity starts to decline or become more variable. Lazear (1983) formally modeled DB retirement incentives as severance payments designed to encourage less-productive workers to retire.

The Principal-Agent, or Shirking, Model

This model suggests productivity gains result from increased worker effort in response to pension incentives and long-term employment contracts. If productivity cannot be measured easily, employees are likely to “shirk.” One way to deter employees from shirking is through close supervision; however, the high monitoring costs may not be worth the benefits. Becker and Stigler (1974), and Lazear (1979) first suggested deferred compensation as a solution to this principal-agent problem. The firm pays workers less than the value of their output early in their career but promises a compensating wage premium should they stay long enough, therefore imposing a bond that is forfeited if an employee is dismissed for shirking. The deferred compensation solution also requires an incentive to keep employees from working too long. As in the implicit contract model, severance payments or mandatory retirement can serve this role (Lazear 1979).

Information Asymmetry of Selection/Hiring

Recent evidence that quit rates are lower in firms offering defined-contribution (DC), as well as DB, pension plans (Gustman and Steinmeier 1993; Gustman, Mitchell, and Steinmeier 1994) casts doubt on the role of pension capital losses as the mechanism for encouraging organizational productivity under the implicit contracting and shirking models. This has led to the emergence of a selection model in which pensions are viewed as encouraging greater organizational productivity through the attraction of a higher quality workforce.

Ippolito (2002) argues that, independent of training and effort incentives, pensions can enhance organizational productivity by attracting a higher quality workforce. This model is based on three assumptions. First, workers may have different internal rates of discount. Some of them place more value on future rewards and are less focused on immediate gratifications, whereas others are more impatient (higher discounters). Second, employers prefer to hire low discounters. Workers who are more forward looking may possess several desirable attributes that contribute to higher productivity: they are absent from work less, more likely to work unpaid hours, and more willing to invest in training and in their own reputation to gain future promotions and wage increases. Low discounters thus require less monitoring and will be more responsive to deferred incentives. Third, and most important, the in-

ternal discount rates of job applicants are not observable by employers. A solution to the information asymmetry problem has been that firms promise deferred compensation to the level sufficient to match the opportunity wage of a low discounter. As a result, the high discounters would self-select themselves out of the applicant pool. Again, pensions are the tax-preferred vehicle for deferred compensation. Ippolito argues that DC plans are superior to DB plans for screening out high discounters because, under the DC plan, a lump sum payout encourages high discounters to quit early if they are hired by mistake.

Methodology

Data

The employer-employee linked Workplace and Employee Survey (WES), first conducted in 1999, offers a good opportunity to examine the effect of deferred compensation (pension and RRSP coverage) on various mechanisms for increasing organizational productivity. The survey covers a broad range of topics from both the demand and supply side of the labor market. It contains not only detailed demographic and labor market information on individual workers, but also information on various workplace characteristics, business strategy, and human resource practices. There are 23,540 employees surveyed in 1999 within 5,733 establishments. Our sample is restricted to those employees between the ages of 20 and 70, who had positive earnings, and had at least one year of service with a firm that had at least one employee. These restrictions reduced the sample size to 20,454.

About 30 percent of employees sampled in 1999 reported to have only a pension plan, 6 percent only a group RRSP, and about 13 percent both plans. On average, workers stay 7 years with their employers and earn \$19 per hour. About 10.2 percent of them quit their jobs from 1999 to 2000; another 3.3 percent were laid off by their employers.

Dependent Variables: Indirect Measure of Organizational Productivity

Direct evidence that pension incentives can improve employee or firm performance has been weak. Inadequate data is one of the most important factors responsible for this problem (Gustman and Mitchell 1992). Productivity studies have long been hampered by the lack of direct measures of employee output or firm productivity, and the potentially endogenous nature of pension or group RRSP coverage results in even more stringent data requirements.

In the absence of direct evidence, our study focuses on indirect evidence that pension and group RRSP coverage is associated with higher organizational performance. A number of dependent and independent variables at

the individual level are constructed for this purpose. We regress a variety of indirect measures of organizational behaviors that are inputs into individual and organizational productivity, on various retirement savings plans (pension or/and group RRSPs) as a form of deferred compensation. Job tenure and probability of quits, and probability of and days of being laid off have been used to measure employee turnover behavior, while days of unpaid overtime, days of unpaid leave (absenteeism), and days of paid sick leave are intended to reflect employees' work effort. The number of selection tools a firm uses is simply an indication of employer investment in screening/selecting workers of low discount rates. If firms that offer deferred compensation are more likely to provide and preserve employees training and training is positively related to organization productivity, deferred compensation is linked with organization productivity through training. We have two measures that indicate the demand and supply of training; a measure of skill requirement of the job and the adequacy of the amount of training received by the employees. Job rotation and participation in decisions are measures of the enhanced employee participation in the organization of work that may contribute to productivity. In terms of employee performance, a variety of indicator variables are used including: hourly wage rate; promotion rate; pay based on performance appraisal; and job and pay/benefit satisfaction. Finally, days of strikes and lockouts, formal grievance in place and probability of grievance filing in the last twelve months are used to measure the quality of the labor-management relationship.

Deferred Compensation as Reflected in Pension and Group RRSP Coverage

The effects of deferred compensation are indirectly reflected by three variables reflecting pension coverage alone, RRSP coverage alone, and both pension and RRSP coverage together (a hybrid plan). Although we are not able to distinguish pension coverage on the basis of DB and DC status, in light of the predominance of DB plans in Canada, the pension coverage measure alone can be taken to represent a form of plan coverage in which there is greater overall risk of pension losses to the individual as compared to someone covered under a group RRSP, which more closely resembles coverage under a DC plan.

In most previous studies, an inconsistency problem between employee and employer responses on pension/group RRSP coverage has been largely ignored. There is considerable evidence in the literature that the knowledge of many employees about the coverage and features of their plans can be very limited (Luchak and Gunderson 2000).

Because we are looking at relationships between pension/RRSP coverage and employee attitudes and behaviors believed to affect organizational pro-

ductivity, however, we think it is appropriate to use perceived rather than the actual plan coverage (with the exception of employee quits where the corrected employee responses on pension and group RRSPs are used).

Potential Endogeneity Issues

At the firm-level, there is always a concern that pension/RRSP and productivity gains may be jointly determined, thus creating an endogeneity problem for the pension or RRSP variable in the right-hand side of the equation. At the employee level, however, this is unlikely to be a concern. Pension or group RRSP coverage may be able to affect employee attitudes and behavior, although work attitudes and behavior are unlikely to determine employee pension/RRSP coverage. Unlike direct pay, benefits are rarely used to motivate employees for desirable work behavior and performance, although they are frequently used for recruitment purposes (Stone and Meltz 1993). For benefits to be used as motivators, they must be contingent upon job performance and work behavior. But benefits are generally given to all employees as a condition of employment, regardless of performance. An exception is benefits and incentives to executives; however, benefits that are perceived as inadequate can be a source of dissatisfaction, contributing to poor job performance and possible turnover.

Other Independent Variables

Our model also controls for a variety of other variables: personal characteristics, such as age, gender, marital status, presence of dependent children; human capital characteristics, such as time at immigration, job-education match/mismatch, foreign language at home; job characteristics, such as union/collective agreement coverage, total annual earnings (not included in the wage equation), job tenure (not included in the tenure equation), labor market experience, experience squared, and occupation; firm characteristics such as region, industry, firm size, foreign ownership, and not-for-profit organization status; and workplace practices, such as individual incentives, group incentives, other incentives, use of teams, use of technology, training, flexible management, flexible employment, and flexible hours. Such practices are found to have an impact on employee performance and productivity (Morrisette and Rosa 2002; Batt, Colvin, and Keefe 2002).

Estimation

To test the relationships between deferred compensation and organizational productivity, a number of models, either based on logistic regression or ordinary least squares (OLS) models (this is determined by whether the dependent variable is a dichotomous or continuous) were developed. In each case, one of the dependent variables (e.g., tenure) was regressed on the control

variables and three dummy variables representing whether an employee is covered by a group RRSP, a pension plan, or both (HYBRID).

Major Findings

The results are reported in Table 1. For the logit models, all regression coefficients for dummy independent variables have been converted to marginal change in probabilities to reflect the effect of a unit change in the type of plan coverage evaluated at the mean of any particular dependent variable. All *t* statistics are based on regression coefficients and related variance estimates that have been adjusted by the bootstrap weights for the complex survey design of the WES. The use of the bootstrap weights has also corrected the standard errors for the coefficients of all the aggregate variables measuring firm characteristics. Model 1 used no-plan as the reference category. To compare the different impact of pensions and group RRSPs on various employee behaviors, results for model 2, which used pension coverage as the omitted category, are also reported in Table 1.

Employee Selection

It has been shown that employers have put forth more investment in recruitment to the pension- or hybrid-plan covered workers than that to those who are covered by a group RRSP and have no plan at all. The investment is measured by the total number of selection tools. With the mean number of tool of 1.31, hybrid plan-covered and pension-covered workers went through significantly more selection tools (0.29 and 0.26) than those who have no plans, compared with only 0.04 more tools under group RRSPs. This implies that firms are more concerned about future employee-initiated separations (quits) and long-term employment relationships with those employees who are offered a pension or a hybrid plan, consistent with the implicit contract theory. Because workers with high discount rates are less likely to quit even if they were hired mistakenly because of the expected pension capital loss, firms that offer a pension or a hybrid plan would have to utilize more sophisticated hiring tools to select the right individuals (low discounters) in the first place.

On the other hand, the asymmetric information hiring model suggests that the portable group RRSPs may be superior in encouraging workers with low discount rates to stay while allowing high-discount workers to leave without incurring pension capital loss. Therefore, firms with a primary group RRSP may rely heavily on employee self-selection rather than proactive recruitment tools to select their high-quality workforce.

The ordering of the magnitudes is also in line with the expectations that the hybrid plan-covered workers were invested the most through recruitment

TABLE 1
The Effect of Pensions and/or RRSPs on Various Organizational
Performance Measures ($N = 20,454$)

Dependent Variables	Model		Model 1		Model 2	
			Marginal Effect	T Statistic	Marginal Effect	T Statistic
Hiring/selection						
Sum of selection tools (mean = 1.307)	Ordinary	No Plan			-0.262	-8.89
	Least Squares	RRSP	0.038	0.84	-0.224	-5.35
		Pension	0.262	8.89		
		Both Plans	0.286	8.04	0.024	0.66
Employee training						
Skill requirements of job (mean = 2.540)	Ordinary	No Plan	-0.093	-7.56		
	Least Squares	RRSP	0.107	6.14	0.014	0.67
		Pension	0.093	7.56		
		Both Plans	0.100	6.53	0.007	0.54
Amount of Training (mean = 1.722)	Ordinary	No Plan	-0.008	-0.59		
	Least Squares	RRSP	-0.055	-2.22	-0.062	-2.48
		Pension	0.008	0.59		
		Both Plans	0.026	1.85	0.018	1.27
Employee participation						
Job Rotation (mean = 1.210)	Ordinary	No Plan	-0.016	-1.28		
	Least Squares	RRSP	0.040	1.82	0.024	1.08
		Pension	0.016	1.28		
		Both Plans	0.034	2.11	0.018	1.24
Participation in Decisions (mean = 1.545)	Ordinary	No Plan	-0.087	-6.35		
	Least Squares	RRSP	0.107	4.65	0.020	0.94
		Pension	0.087	6.35		
		Both Plans	0.128	7.91	0.041	2.79
Work effort						
Days of Unpaid Overtime (mean = 2.123)	Ordinary	No Plan	-0.038	-0.32		
	Least Squares	RRSP	0.088	0.35	0.050	0.22
		Pension	0.038	0.32		
		Both Plans	-0.263	-2.08	-0.301	-2.26
Days of unpaid leave (mean = 2.611)	Ordinary	No Plan	1.066	4.16		
	Least Squares	RRSP	-1.030	-3.59	0.036	0.12
		Pension	-1.066	-4.16		
		Both Plans	-1.127	-3.35	-0.061	-0.19

TABLE 1 CONT.
The Effect of Pensions and/or RRSPs on Various Organizational
Performance Measures (N = 20,454)

Dependent Variables	Model		Model 1		Model 2	
			Marginal Effect	T Statistic	Marginal Effect	T Statistic
Days of paid sick leave (mean = 2.434)	Ordinary	No Plan	-1.055	-2.01		
	Least	RRSP	2.541	3.75	1.486	1.79
	Squares	Pension	1.055	2.01		
		Both Plans		0.412	1.38	-0.643
Employee performance						
Hourly wage (\$/hour) (mean = 19.11)	Ordinary	No Plan	-2.794	-9.84		
	Least	RRSP	1.749	6.14	-1.046	-2.89
	Squares	Pension	2.794	9.84		
		Both Plans		2.354	8.44	-0.441
Promotion rate (mean = 0.244)	Ordinary	No Plan	-0.028	-1.76		
	Least	RRSP	0.012	0.55	-0.016	-0.74
	Squares	Pension	0.028	1.76		
		Both Plans		0.096	5.74	0.068
Performance appraisal affecting pay or benefits (mean = 0.268)	Logit	No Plan	-0.073	-6.90		
		RRSP	0.091	4.06	0.001	0.059
		Pension	0.089	6.90		
		Both Plans	0.178	11.9	0.079	5.77
Satisfaction with job (mean = 4.129)	Ordinary	No Plan	-0.154	-6.94		
	Least	RRSP	0.071	1.24	-0.084	-1.53
	Squares	Pension	0.154	6.94		
		Both Plans		0.213	8.49	0.059
Satisfaction with pay and benefits (mean = 3.651)	Ordinary	No Plan	-0.182	-6.65		
	Least	RRSP	0.171	4.51	-0.012	-0.30
	Squares	Pension	0.182	6.65		
		Both Plans		0.268	9.81	0.086
Labor relations						
Days of strikes and lockouts (mean = 0.345)	Ordinary	No Plan	0.006	0.06		
	Least	RRSP	0.333	1.48	0.339	1.78
	Squares	Pension	-0.006	-0.06		
		Both Plans		-0.023	-0.23	-0.017

TABLE 1 CONT.
The Effect of Pensions and/or RRSPs on Various Organizational
Performance Measures ($N = 20,454$)

Dependent Variables	Model		Model 1		Model 2	
			Marginal Effect	T Statistic	Marginal Effect	T Statistic
Grievance in place (mean = 0.503)	Logit	No Plan	-0.150	-9.53		
		RRSP	0.079	2.90	-0.075	-2.58
		Pension	0.150	9.53		
		Both Plans	0.127	7.39	-0.025	-1.72
Probability of grievance being filed (mean = 0.054)	Logit	No Plan	-0.004	-0.75		
		RRSP	0.001	0.11	-0.003	-0.36
		Pension	0.004	0.75		
		Both Plans	-0.009	-1.72	-0.013	-2.67
Turnover behavior						
Job tenure (years) (mean = 7.359)	Ordinary	No Plan	-0.548	-3.49		
		RRSP	0.432	1.90	-0.116	-0.53
	Squares	Pension	0.548	3.49		
		Both Plans	0.579	2.95	0.031	0.16
Probability of quit ^a (mean = 0.102)	Logit	No Plan	0.093	3.18		
		RRSP	0.013	0.30	0.115	1.92
		Pension	-0.051	-3.18		
		Both Plans	-0.057	-2.64	-0.011	-0.37
Probability of layoffs (mean = 0.033)	Logit	No Plan	0.022	4.69		
		RRSP	-0.017	-3.53	-0.005	-0.78
		Pension	-0.013	-4.69		
		Both Plans	-0.009	-1.89	0.008	1.23
Days of Layoffs (mean = 1.478)	Ordinary	No Plan	0.382	1.74		
		RRSP	-0.549	-2.25	-0.167	-0.67
	Squares	Pension	-0.382	-1.74		
		Both Plans	-0.554	-2.19	-0.171	-0.84

^aUnlike other estimates, which are based on the 1999 employer-employee linked data, the effects of the three plans on quit probability are estimated from both 1999 and 2000 WES ($N = 18,404$). The dependent variable quit is defined as an employee who left voluntarily from his/her employer from 1999 to 2000. All the independent variables are derived from the 1999 data.

Source: WES, 1999–2000.

efforts, followed by the pension-covered workers. The group RRSP-covered workers went through the least scrutiny during the hiring process.

Employee Training

The assumption that training boosts productivity (therefore also wages) is generally accepted by academics and policy makers alike. Recent studies suggest that training raises wages and that wage growth is faster after workers receive training (Lynch 1992). Bartel (1994) also found that firms that support greater training expenditures experience more rapid increases in productivity, and training leads to higher performance reviews and faster wage growth.

We find that pension (but not the RRSP) incentives are generally consistent with the implicit contract theory and firm-specific training model, where pension quit penalty may serve as a severance tax and thus preserve firm investment in employee training. Our results show that, although jobs that are covered by each of these three retirement savings plans have significantly stronger skill requirements than those without a plan (0.11 for RRSP, 0.10 for pension plan, and 0.09 for the hybrid plan relative to the mean skill requirement of 2.54), only the hybrid plan-covered workers reported to receive more training (0.03 relative to the mean training amount of 1.72) than those who have no plan at all. Pension-covered workers are also found to receive more training (0.01) although the differential is not statistically significant. In fact, RRSP-covered workers are found to receive less training (-0.06) in comparison with the workers of no plans. This evidence suggests that the portable group RRSPs may not be able to preserve employer-sponsored training, therefore firms that offer a group RRSP would have to depend on labor market sorting for selecting experienced workers with previous training, consistent with the information asymmetry of selection/hiring hypothesis.

Employee Participation

There is some evidence from the empirical literature that enhanced worker participation may contribute to productivity. For example, Wilson and Peel (1991) use pooled cross-sectional time series data on quits and absenteeism for fifty-two engineering and metal-working firms in the United Kingdom and find that firms with profit-sharing schemes and employee participation in decision making have lower quit rates and absenteeism rates than others. Batt, Colvin, and Keefe (2002) conclude that those employees with employee participation in offline problem-solving teams and self-directed workgroups have lower quits rates than others in the telecommunications industry. Using the U.S. National Employers Survey, Cappelli and Neumark (2001) find establishments with self-directed workgroups, job rotation, and profit-sharing have lower quits rates than others.

Our results show that workers covered by each of the three types of plans are more likely to participate in the job rotation program, and only the hybrid plan has a significant effect at the 5 percent level (0.03 effect relative to the mean of 1.21). This is followed by a group RRSP (0.04), although the difference in employee participation between pension and group RRSP is insignificant. The decision rights on RRSP investment are also consistent with the demand for participation in the workplace. Workers who have either of the plans have significant larger propensity to be involved in workplace decision making (0.11 for RRSP, 0.09 for pension plan, and 0.13 for hybrid plan), although the likelihood is clearly the greatest for those covered by a hybrid plan.

Work Effort

The central argument of a pension/RRSP effect on work effort has been the bonding/shirking theory. Because quitting or dismissal for cause may result in forfeiture of the “bond” (the pension wealth), the employee should have every incentive to work up to the firm’s expectations. The “shirking” model suggests that DB plans are well suited to this task, where the incentive for not shirking is the avoidance of the “pension capital loss”. The “selection” model argues otherwise. The quit penalty may be too weak, particularly for the new hires. The DC plans can be a more effective mechanism to sort in more productive workers or the low discounters who have longer horizons and possess several desirable attributes such as less absenteeism, working more unpaid hours, and being more forward-looking by investing in training and focusing on future promotions and wage increases.

Our results support the “selection” model for group RRSPs and the “shirking” model for pension and hybrid plans. The potential effect for RRSPs is strong in two of the three indicators of work effort in comparison with the no-plan workers: more days of unpaid overtime (0.09 days relative to the mean 2.12 days), and fewer days of unpaid leave or absenteeism (1.03 days relative to the mean 2.61 days). A complementary explanation is that employer-matched RRSP funds can be seen as a cash bonus and tax-preferred savings.

Although hybrid plan-covered workers had fewer paid sick days (0.4 days relative to the mean of 2.4) than workers covered by two other plans, RRSP covered workers did report significant more sick days (2.5 days relative to the mean of 2.4 days) than no-plan workers. We do not, however, know whether the actual underlined reasons for the sick leave (working too hard or not wanting to work).

Employee Performance

There is clear evidence that all three types of retirement savings plans are, to some extent, associated with favorable labor market outcomes. In

terms of the differential of the effect among them, it is particularly strong and consistent for the hybrid plan followed by the pension plan, and the relationship is weaker and less consistent for the RRSP only.

As shown in Table 1, we find all three coverage measures are significantly related to hourly wages (\$1.75/hour for RRSP, \$2.79/hour for pension, and \$2.35/hour for hybrid plan, relative to the mean wage of \$19.11/hour). If pensions/RRSPs are only a vehicle for tax-preferred savings with no implications for superior productivity, there should be a trade-off between cash wages and nonwage benefits. On the other hand, if pension/RRSP-covered workers receive more training, put in greater effort, and are more likely to stay when their productivity is high and more likely to leave when their productivity has declined, higher wages from superior productivity should occur. A complementary explanation proposed by Gustman and Steinmeier (1995) argues that the pension wage premium represents an efficiency wage and is more important than pension back-loading in reducing turnover and deterring shirking, particularly for workers with short tenure. The fact that pension and hybrid plans yield significantly larger wage premiums than RRSPs may only be a result of the insignificant effect of RRSPs on reducing quit behavior. Pension-covered firms are usually larger, unionized firms that emphasize firm-specific training due to low quits.

Consistent with the hourly wage rate measure, workers covered by pension plans or hybrid plans perform better than nonplan workers in promotion rate (0.096 relative to the mean of 0.244), while the RRSPs only yield positive yet insignificant impact (0.012). It is clear that the hybrid plan-covered workers are ahead of the promotion game compared with other three types of workers.

Workers under the coverage of either of the three types of retirement savings plans are also more likely to have a performance appraisal that affects their pay and benefits than do their nonplan counterparts (0.091 for RRSP, 0.089 for pension plan, and 0.178 for hybrid plan, relative to the mean of 0.268). Although workers with hybrid plan-covered workers are significantly more likely to have performance management than other types of workers, the difference between pension and RRSPs is not significant.

Job satisfaction is a well-established predictor of affective commitment and higher productivity. In the WES, both job and monetary satisfactions are measured by a five-point scale (with 1 being very satisfied and 5 being very dissatisfied). For a matter of simplicity, both variables have been reverse-coded to facilitate the interpretation of the coefficients. Workers who are covered by a pension or hybrid generally view their work settings as more attractive than those who do not have a plan (0.154 for pension plan and 0.213 for hybrid plan, relative to the mean of 4.129), even after other per-

sonal, job and firm characteristics as described above are accounted for. Having a RRSP also shows some positive yet small and insignificant impact on job satisfaction (0.071). It is not surprising that workers who are covered by any of the three types of plans are also more satisfied with their compensation than those who have no plan at all (0.171 for RRSP, 0.182 for pension, and 0.268 for hybrid, relative to the mean of 3.651). Workers who have a hybrid plan, however, are significantly happier with their pay and benefits than are workers in the other two types of plans.

Labor Relations

Adversarial employer-employee relations featured by frequent strikes and lockouts can be extremely disruptive to the production process and result in substantial loss in productivity. As opposed to pension and hybrid plan coverage, RRSP coverage seems to have negative effect on cooperative labor relations as measured by days of strikes and lockouts (0.333 days relative to the mean of 0.345 days), although none of the three types of plans has a significant effect.

Another set of measurements of industrial relations environment in the workplace has been the formal grievance procedure in place and probability of grievance filing in the previous twelve months. Workers who are covered by each of the three types of plans are more likely to have a formal grievance procedure at work than those who do not have a plan (0.079 for RRSP, 0.150 for pension, and 0.127 for hybrid, relative to the mean of 0.503); however, only those covered by a hybrid plan are less likely to file a grievance in the past twelve months (-0.01 relative to the mean of 0.05).

Employee Turnover

With respect to the various measures of employee turnover, the different pension types generally reduce turnover as evidenced by their positive effects on tenure and negative effects on the probability of quitting or being laid off or the days laid off. One exception is that RRSP-covered workers are slightly more likely to quit than are those who do not have any plan, although the effect is not statistically significant. Specifically, relative to those who had no pension plans, employees who were covered only by a group RRSP had a little less than one half year longer tenure with the firm, whereas those who had only a private pension plan had slightly more than six months longer tenure with their firms. Those who were covered by both a group RRSP and a pension plan had the longest tenure, 0.58 years longer than those with no plan. The ordering of the magnitudes are generally as expected, because private pensions have stronger incentive effects than group RRSPs and having both is expected to have the strongest effect.

Workers who are covered by a pension plan or a hybrid plan are much less likely to quit than those having no plans (5.1 percent for pension plan versus 5.7 percent for hybrid plan). Having a group RRSP, however, tends to increase the probability of quitting, although the effect is small and insignificant. This evidence suggests that the implicit contract theory is still the major mechanism for pension and hybrid plans, although the information asymmetry of hiring may also be at work, particularly for the group RRSPs.

Our results also show that all three plans deter employer-initiated separations (layoffs) and the RRSPs have the largest effect (1.7 percent for RRSP, 1.3 percent for pension, and 0.9 percent for hybrid, relative to the mean layoff rate of 3.3 percent). The firm-specific training investments and the principal-agent model can only explain part of the story. The self-selection model seems to play an important role here. Workers who are more productive are less likely to forfeit deferred compensation due to a discharge. Because the portability of RRSP assets encourages high discounters to quit after being mistakenly hired, firms that offer RRSPs are reluctant to lay off these employees once into their system.

Summary and Conclusions

We find both pensions and RRSPs to have productivity enhancing effects, but for different reasons. On the one hand, productivity gains from pension plans work more through the channels of quit reduction, employer-sponsored training, and employer selection, which is in line with the training and shirking models. On the other hand, productivity gains through group RRSPs are achieved more through layoff deterrence and greater work effort, which is consistent with the information asymmetric hiring/selection model. Furthermore, pensions and RRSPs are complementary in the sense that “hybrid plans” have the largest positive impact on employee performance, including wage premium, promotion rate, pay for performance, money satisfaction, and overall job satisfaction. This evidence is consistent with the notion that firms invest heavily in their core employees by offering them both pension and group RRSPs. They are also paid better wages and are more likely to receive pay based on performance appraisal. They also have a better chance to be trained and promoted and enjoy more participation in the decision-making process. In return, those workers have exhibited generally greater work effort, are much more satisfied with their job and pay, are less likely to quit or to be laid off, and maintain more cooperative employment relations with their employers.

We believe these results are interesting and may advance the empirical literature on the incentive effects of occupational pension plans and other retirement savings plans such as group RRSPs. Although no simple piece of

indirect evidence based on reduced-form estimates is conclusive, a consistent pattern of the results may be suggestive and powerful.

The current lack of understanding of channels through which pensions/RRSPs may enhance organizational productivity makes it difficult to predict the future of pension plan coverage in Canada. Pension coverage, in particular, the DB plan coverage, has been in slow decline in the past two decades. Some empirical evidence has suggested that this trend reflects structural changes in the labor market (namely, the decline of manufacturing and unionized firms that traditionally offer a DB pension plan to their workers) and public policy that lowered the tax advantages of DB pension coverage (Luchak, Fang, and Gunderson 2004). Research has also shown that the growth of the DC type of retirement savings plans (group RRSPs and 401[k] plans included) have occurred primarily in sectors where productivity gains from DB incentives are arguably smaller (Dorsey, Cornwell, and Macpherson, 1998). Therefore, the trend to primarily DC coverage is not necessary the evidence of a declining importance for productivity incentives. Our results have also concluded that the productivity costs of moving from pension plans (mostly DB plans in Canada) to the group RRSPs may not be trivial, this is particularly clear in the areas of employee turnover, employee training, and almost all our measures of employee performance (hourly wage, promotion rate, job satisfaction, and labor relations).

This study also lends some support to the hypothesis that pensions or/and group RRSPs may attract individuals who are inherently productive (low discounters). This is more likely to be the case for the incentive effects of the group RRSPs and the hybrid plans that link to organizational productivity. Empirical labor studies have proved the importance of unobserved individual/firm specific effects on wages and other labor market outcomes, but so far there is no concrete evidence that pension/RRSP selectivity incentives are important. Future research should incorporate firm and individual specific effects to measure the productivity differences among workers under various private retirement savings arrangements.

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