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The timing of pay

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ABSTRACT

There exists large and persistent variation in not only *how*, but *when* employees are paid, a fact unexplained by existing theory. This paper develops a simple model of optimal pay timing for firms. When workers have self-control problems, they under-save and experience volatile consumption between paychecks. Thus, pay whose delivery matches the timing of workers' consumption needs will reduce wage costs. The model also explains why pay timing should be regulated (as it is in practice): although the worker benefits from a timing profile that smoothes her consumption, her lack of self-control induces her to attempt to undo the arrangement, either by renegotiating with her employer or by taking out payday loans. Regulation of pay timing and consumer borrowing is required to counter these efforts, helping the worker help herself.

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1. Introduction

Pay him his wages each day before sunset, because he is poor and is counting on it. Otherwise he may cry to the Lord against you, and you will be guilty of sin. Deuteronomy 24:15

Wages can vary along three dimensions. *Level* differences, such as a car salesman earning \$40,000 versus a librarian earning \$30,000, are usually attributed to workers having different marginal products or outside options.¹ *Structure* differences, such as a bartender being paid mostly in tips versus a salaried postal worker, typically arise in response to incentive or information problems. *Timing* differences, the subject of this paper, are variations

in the temporal patterns of when pay, for a given level and structure, is disbursed to employees. Examples would include a farm issuing laborers weekly or monthly paychecks, a bank awarding bonuses to its tellers around Christmas, or a university spreading out a professor's nine-month salary over 12 months.

In contrast to an extensive theoretical literature on the first two dimensions, there is a comparative absence with respect to pay timing. This paper is an initial attempt to address this void.

Our analysis is motivated by two facts. First, under standard assumptions, the timing of wage payments should not matter—workers can save or borrow to create any timing profile they desire—but the data suggest otherwise. The timing of bonuses is an example: in many cases, employers temporarily boost wages to coincide with holidays (Christmas bonuses in North America), vacation (summer bonuses in Greece), or job transitions. The goal, it seems, is to minimize the *time* between when money is delivered, and when it is spent. Another common example

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¹ It has also been noted that wage levels can serve incentive (Lazear and Rosen, 1981; Shapiro and Stiglitz, 1984) or signaling (Hayes and Schaefer, 2009) functions.

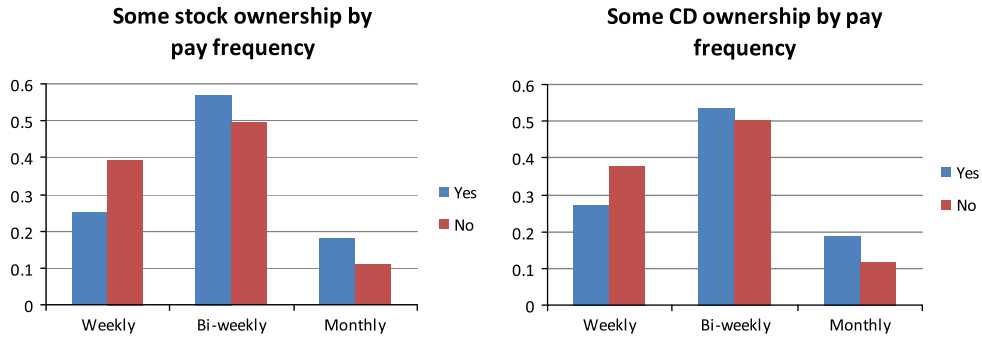


Fig. 1. Capital market participation by pay frequency. Data are found in the US Census Bureau's Survey of Income and Program Participation, 1996. For clarity, we restrict attention to workers who report being paid weekly, bi-weekly, or monthly. Of all surveyed employees that own at least some stock, 22% are paid weekly and 19% monthly, with the remainder paid bi-weekly. Of surveyed employees that do not own stock, 40% are paid weekly while only 10% are paid monthly. Stock owners are nearly twice as likely to be paid monthly and almost half as likely to be paid weekly. Similar, though less extreme, numbers as associated with CD ownership.

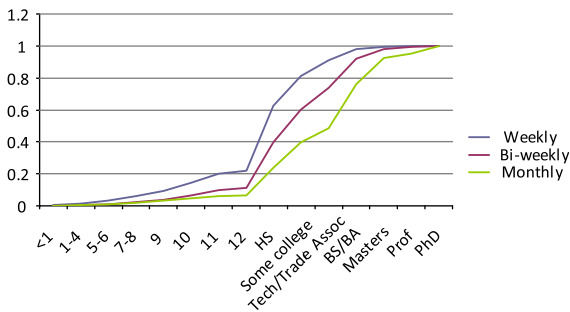


Fig. 2. Pay frequency and educational attainment. Data are found in the US Census Bureau's Survey of Income and Program Participation, 1996. For clarity, we restrict attention to workers who report being paid weekly, bi-weekly, or monthly. This figure reports cumulative distributions of educational attainment, stratified by the worker's pay frequency.

Average monthly income by pay frequency

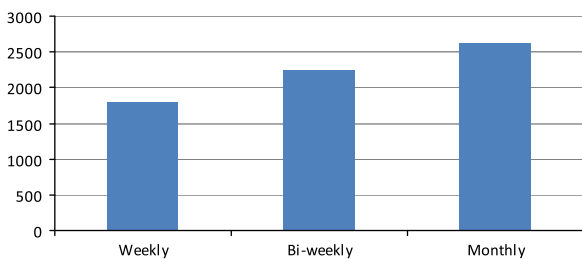


Fig. 3. Pay frequency and income. Data are found in the US Census Bureau's Survey of Income and Program Participation, 1996. For clarity, we restrict attention to workers who report being paid weekly, bi-weekly, or monthly.

of timing is pay frequency, i.e., how often workers are regularly paid for their efforts. Figs. 1, 2, and 3 show that the variation in U.S. worker pay frequency is large and nonrandom, varying systematically with education, financial sophistication, and income. Rather than being arbitrary or irrelevant, pay timing mechanisms appear to be addressing a fundamental economic problem—specifically, one rooted in time.

Second, pay timing is often regulated. In the U.S., 45 states explicitly legislate pay frequency, often by type of work. For example, with the exception of executive, administrative, and professional workers, the state of Maryland requires firms to issue paychecks at least twice a month. Pay timing is also regulated internationally. In many countries, holiday bonuses are mandatory. The Mexican *aguinaldo* and Indonesian *Tunjangan Hari Raya*, for example, are bonuses paid at Christmas and Ramadan, respectively. As of this writing, Greek workers are still by law awarded “14 months” of pay per year, with one additional month's pay delivered at Christmas, one-half month's at Easter, and the balance during the summer holidays. Other examples abound.

These observations set the bar for any plausible theory: pay timing should influence worker welfare, and should benefit from regulation. We propose a simple framework, based upon the seminal work of Laibson (1997), that yields both implications.²

Consider a savings problem involving a present-biased worker. When she receives a paycheck, she faces a strong urge to consume a large fraction of it immediately, even though she knows this will leave her poor in future periods. Although she recognizes her own self-control problems, she cannot stick to a predetermined consumption schedule. Consequently, her realized consumption path will not maximize her ex ante welfare.

Because time is the culprit, it follows that her employer can improve her welfare by closing the gap between when she receives money and when she would prefer, ex ante, to spend it. Essentially, the firm chooses a timing profile that reduces the worker's reliance on her own (inadequate) ability to commit to a future spending path. Moreover, to the extent that the worker understands this ex ante, a well-timed pay profile will reduce the overall wage the worker is willing to accept. Basic calculations suggest that the welfare benefits—and therefore wage savings—can be large, depending on the worker's lack of self-control.

² Numerous experimental and field studies point to people having time-varying discount rates. See Barro (1999), O'Donoghue and Rabin (1999), Jovanovic and Stolyarov (2000), Harris and Laibson (2001), Gul and Pesendorfer (2001), Fernández-Villaverde and Mukherji (2002), and Laibson, Reppeto and Tobacman, 1998.

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