Journal of Asian Economics 21 (2010) 76–86

Contents lists available at ScienceDirect

Journal of Asian Economics

Pay as incentive or pay as reward? The case of Taiwan

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ARTICLE INFO

Article history:
Received 18 July 2008
Received in revised form 6 February 2009
Accepted 1 May 2009

JEL classification:
J3
J30
J33
J41

Keywords:
Efficiency wages
Linear feedback
Labor productivity
Taiwanese labor market

ABSTRACT

By the 1980s, Taiwan had gradually transformed itself from an economy in which labor was plentiful, while capital was in short supply, into an economy in which a surplus of capital was accompanied by a shortage of labor. For labor economists interested in rapidly evolving labor markets, there are many intriguing questions arising out of this transition. This study explores how conventional labor market and efficiency wage theories apply during this transformation. Based on monthly data over the period 1982–2007, we examine the linear causality between pay and productivity using Geweke's [Geweke, J. (1982). Measurement of linear dependence and feedback between multiple time series. *Journal of the American Statistical Association, 77*, 304–313] linear feedback technique. The results indicate that both pay as reward and pay as incentive behaviors are significant in the Taiwanese economy, with pay as incentive especially strong in the manufacturing sector.

1. Introduction

Standard economic theory predicts productivity growth should lead to higher wages. However, several variations of the efficiency wage theme have been put forward explaining why higher wages may lead to increases in productivity. Shapiro and Stiglitz (1984) suggest, by creating unemployment, above equilibrium wages will increase worker effort. Salop (1979) indicates that worker turnover is related to pay, and thus wages will rise above the market clearing level as firms try to reduce turnover costs. Akerlof (1984) provides several additional mechanisms, sociological in nature, where wage increases could improve worker performance. Additionally, higher wages may allow the firm to attract better employees (Stiglitz, 1976; Weiss, 1980), or may directly impact worker productivity in poor countries by increasing nutrition (Bose, 1997).

A variety of empirical methods have been used to test for efficiency wages, with the resulting evidence being mixed. In this paper we use the Geweke (1982) method to test the association between wages and productivity in Taiwan, and find strong support for both directions of causality; productivity increases lead to wage increases, and wage increases lead to productivity increases. However, most of the increases in productivity occur immediately following the wage increase, suggesting that the effect may diminish rather quickly. The results also indicate that the connection between wages and productivity has become more pronounced in Taiwan during the last decade.

The remainder of the paper is organized as follows: Section 2 provides a summary of previous studies on efficiency wages. Section 3 provides a brief description of the evolution of labor market conditions in Taiwan. In Section 4, we present the empirical methodology and model specification. Section 5 describes the data and presents the results of the analysis. Summary and concluding remarks follow in the final section.

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doi:10.1016/j.asieco.2009.05.001

2. Literature review

As wages across industries tend to vary significantly, one approach used to test for efficiency wages is to examine the factors that explain this pay differential. Krueger and Summers (1988) interpret much of the wage differential between U.S. industries as evidence of efficiency wages. However, this conclusion is not supported by Murphy and Topel (1987). Additionally, Leonard (1987) provides evidence that wages across narrowly defined occupations within a specific labor market are also widely dispersed, suggesting factors other than efficiency wages explain inter-industry wage differentials. Chen and Edin (2002) find mixed evidence for the proposition that wage differentials in Sweden are the result of efficiency wages.

Several studies test efficiency wages by focusing on wage and productivity changes over time at the firm or industry level. This type of analysis avoids the problem associated with explaining wage differentials across industries, which may reflect unmeasured productivity differences. A well known example is Henry Ford's significant wage increase in 1914, which Raff and Summers (1987) suggest is consistent with efficiency wage theory. However, this conclusion is challenged by Taylor (2003), who argues that Ford was motivated by factors unrelated to efficiency wage considerations. Karahan, Razzolini, and Shughart (2006) show that higher wages for public officials did not lead to less corruption in Mississippi, a finding they conclude is not supportive of efficiency wage behavior. Furthermore, Lee and Rupp (2007) provide evidence that pilot effort is not significantly affected by pay cuts. However, Capelli and Chauvin (1991) analyze individual firm behavior and find that wage increases result in less shirking, supporting at least one version of efficiency wage theory. Furthermore, Levine (1992), using panel data, finds productivity gains associated with wage increases that are sufficiently large to pay for themselves. Although he concludes that efficiency wages are a plausible explanation, he nonetheless suggests the results are also consistent with rent sharing.

Another statistical approach avoids direct analysis of industry and/or firm data, and instead searches for other evidence that sheds light on the relationship between wages and productivity. Along these lines, efficiency wages find support from studies that utilize experimental evidence (e.g., Berg, Dickhaut, & McCabe, 1995; Fehr, Gachter, & Kirchsteiger, 1997). Based on survey evidence, Agell and Lundborg (1995) suggest that notions of fairness are important, which can be viewed as consistent with efficiency wage behavior. Additional survey evidence supportive of efficiency wages can be found in Agell (2004). Blinder and Choi (1990), however, utilizing wage-setter surveys, find no support for the adverse selection version of efficiency wages.

If efficiency wages are utilized we would expect pay increases to cause productivity increases, but productivity increases should continue to lead to pay increases as well. Thus, it becomes difficult to determine whether the association between pay and productivity is due to efficiency wages or just the result of higher pay for higher productivity. Campbell (1993), who finds support for the turnover version of efficiency wages, nonetheless notes the difficulties involved in isolating the effect of wages on productivity. Wadhwani and Wall (1991), using U.K. data, suggest efficiency wage behavior is the most plausible explanation for the association between wages and productivity, but they do not exclude rent sharing as a possible explanation.

Fuess and Millea (2002) and Millea and Fuess (2005) address this issue by applying a linear feedback technique developed by Geweke (1982, 1984) to time series data for Japan and the U.S., respectively. Their statistical technique allows them to distinguish between the effects of pay on productivity and productivity on pay. The results suggest that efficiency wages are not common in Japan. However, for the U.S., there is evidence that wage increases lead productivity increases for the nondurable sector of the economy. As it is not clear why efficiency wages would be used in the U.S. but not Japan, it is useful to conduct similar tests for other countries utilizing this approach.

3. The transition of the Taiwanese labor market

Since the 1980s, Taiwan has gradually transitioned from an economy in which labor was plentiful into an economy in which a surplus of capital was accompanied by a shortage of labor. Furthermore, the economy has experienced dramatic changes in its industrial structure during this transformation. Taiwan's move towards political democracy has also impacted Taiwan's industrial relations system. One of the most important tasks facing business organizations during the transition has been managing wages and salaries in response to the structural transformation in the labor market. In particular, rising wages and an appreciating local currency pushed manufacturers of labor-intensive products either abroad or into high value-added goods, notably in the electronics and information technology industries. Throughout the 1990s, only the electronics and precision machinery industries continued to grow. By the late 1990s, these two industries had replaced Taiwan's traditional industries as the backbone of the industrial structure, and thus Taiwanese manufacturing was metamorphosing into a high-tech sector.[1]

Despite a continuing shift of capacity of traditional labor-intensive manufacturing to mainland China, the government has successfully encouraged the growth of some important industries in recent years, such as cars, steel, textiles, plastic, and machinery.[2] As production technology improved in these industries, skilled labor has substituted for unskilled labor in the

[1] The fall in the total number of manufacturing sector workers in the late 1980s and early 1990s had been largely confined to production line workers, while the total number of higher-level employees continuously rose throughout this period (Wu, 2007).

[2] Refer to the Economist, Economic Intelligence Unit, Country Profile Taiwan 2008.