Journal of Economic Dynamics & Control 52 (2015) 136–149

Contents lists available at ScienceDirect

Journal of Economic Dynamics & Control

journal homepage: www.elsevier.com/locate/jedc

Competition, work rules and productivity

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ARTICLE INFO

Article history:
Received 26 September 2014
Received in revised form
21 November 2014
Accepted 26 December 2014
Available online 2 January 2015

Keywords:
Competition
Productivity
Restrictive work rules
Labor unions

JEL classification:
J51
L11
O14

ABSTRACT

I develop a theory to explain why workers want restrictive work rules, those that induce wages to be paid for non-productive labor hours, and why competition reduces them. Work rules allow workers to maintain both high levels of employment and wages. They generate a fixed payment that transfers the firm's surplus to workers, which wages alone cannot do, making them robust to alternative modeling assumptions. Competition loosens work rules by reducing the firm's surplus, which increases productivity.

Published by Elsevier B.V.

1. Introduction

More competitive markets are typically associated with higher productivity (see Aghion and Griffith, 2005; van Reenen, 2011 for surveys of the evidence.) There are a number of cases where an increase in competition led to a jump in productivity. For example, Schmitz (2005) documents enormous increases in labor productivity in U.S. iron ore mining after low cost Brazilian producers entered the market. Similar results have been found in coal mining (Parente and Prescott, 2000), international iron ore mining (Galdon-Sanchez and Schmitz, 2002), Brazilian oil extraction (Bridgman et al., 2011) and U.S. cement (Dunne et al., 2010) (see Holmes and Schmitz, 2010 for a survey of this literature.)

These gains are due largely to improvements at existing firms and are not due to the reallocation of inputs to more productive firms.[1] In each of these cases, there was neither a new nor an old, unadopted technology that was implemented to explain the increase. These studies argue that productivity improved when restrictive work rules, those that induce wages to be paid for non-productive labor hours, were eliminated. For example, Schmitz (2005) finds that the number of job categories declined in U.S. iron ore mines when Brazilian ore entered the U.S. market. When U.S. steel makers faced intense foreign competition in the 1980s, plant managers at U.S. Steel began to violate the work rules in the contract to increase productivity (Hoerr, 1988). Lamarche (2013) finds that reductions in work rules increased productivity in Argentina.

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[1] A complimentary literature has examined the impact of misallocation of inputs on productivity. For example, see Restuccia and Rogerson (2008) and Klenow and Hsieh (2009).

http://dx.doi.org/10.1016/j.jedc.2014.12.008
0165-1889/Published by Elsevier B.V.

It is puzzling that workers would want to reduce efficiency when higher productivity would allow employers to pay higher wages. Yet, history is filled with instances of labor unions expending significant organizing resources to obtain and keep work rules. They must serve an important role, which this paper seeks to explain. I develop a theory to explain why workers would want restrictive work rules and why competition reduces them. The model economy features a monopoly firm whose workers care about both total employment and wages. The incumbent workers can dictate wages and work rules. The workers wish to employ all incumbent workers and increase wages. I examine the impact of competition on productivity and why work rules are used instead of all cash contracts.

Restrictive work rules allow workers to push up both employment and wages. Without work rules, increasing employment comes at the cost of reducing wages. Work rules in the form of a fixed labor cost generate a source of labor demand to counteract the wage effect. This additional labor demand allows the union to transfer the firm's monopoly rents to workers. The firm sets set its price as a mark-up over wages, generating a profit margin that wages alone cannot capture. Work rules generate a fixed payment to labor that transfers the mark-up to the workers. In the language of monopoly pricing, the labor contract is a two part tariff with work rules acting as the fixed cost.[2] This mechanism is valuable in a wide variety of settings. As long as there is a mark-up over cost, work rules provide a means for workers to capture it. Therefore, the use of work rules apply beyond the model's specific assumptions.

Competition reduces the restrictiveness of work rules and increases productivity. When new competitors who can sell below the monopoly price enter, monopoly rents fall. Since they are a tool to transfer rents to the workers and there are fewer rents to transfer, work rules are loosened. Maintaining monopoly level work rules would drive the firm out of business.

Despite being an abstract model, it matches a number of features of the data. It predicts that work rules do not change in response to small changes in demand, which is consistent with the evidence. It is also able to match quantitatively the productivity and wage effects of work rules. For reasonable parameter values, it generates these effects for a historical instance of removing work rules.

A major reason for developing the model is to examine methods of increasing productivity when there are work rules. It is difficult to get the firm and union to agree to eliminate work rules on their own. The union will only agree to convert work rules to cash payments if the firm faces no competition. Even when deals are possible, the private gains to firms and workers of such deals are the smallest when the increase in productivity is the largest. Therefore, even small negotiating frictions may prevent deals that would have the biggest impact.

The model suggests that developing policies to increase productivity is surprisingly complex. Exposing a monopoly to imperfect competition will limit work rules, but eliminates the possibility of a deal to eliminate them entirely. Limiting new work rules can be damaging to productivity by inducing resistance to new technology. New, higher productivity technology reduces the power of work rules to increase employment. When demand is sufficiently inelastic, the union will only allow the adoption of new technology if it is allowed to impose more work rules to maintain employment. Therefore, a legal restriction on new work rules could have the unintended consequence of limiting productivity growth.

Other papers have examined work rules. In an appendix, Schmitz (2005) shows that work rules in the form of a fixed cost reduce productivity. This paper extends this insight to an environment where the restrictiveness of these rules are an endogenous outcome. The closest work to this paper is Greenwood and Weiss (2013), who present and parameterize a model of wasteful work rules. While the details of the two models differ, the mechanism is similar: Unions that care about employment levels use work rules to extract surplus. The main difference is in focus. Greenwood and Weiss (2013) focus on quantitatively matching the iron mining example in Schmitz (2005), while this paper focusses on qualitative theoretical results, with particular emphasis on why work rules are so difficult to remove despite being inefficient.

Other papers feature endogenous work rules, but do not generate restrictive work rules. Johnson (1990) finds that if unions care about total employment as well as wages, they may trade off higher wages for employment. These work rules are not inefficient since all labor is used in production. Kahn and Reagan (1993) show that workers with a disutility to labor may use work rules to impose downtime to reduce work effort. These work rules are also not inefficient. Workers trade off higher wages for less strenuous work. I am able to explain restrictive work rules even without disutility to labor. Further, these papers do not examine the impact of competition on work rules.

A related literature has examined the impact of market size on productivity. These papers have generally found that larger market size increases innovation. For example, see Desmet and Parente (2010), Vives (2008) and Bai and Herrendorf (2008). Holmes et al. (2012) predict that a monopolist will adopt new techniques, including fighting to remove work rules, when demand is low. The force they identify, that new technologies are subject to start-up delays, is an additional reason falling demand increases productivity.

This paper is part of a theoretical literature examining productivity and labor unions, including Dowrick and Spencer (1994), Acemoglu et al. (2001) and Lommerud et al. (2006). Alder et al. (2014) examine the role of weak competition, including restrictive union policies, on the U.S. manufacturing. Other papers have investigated the impact of labor unions on the decision to outsource work (Holmes and Snider, 2011) and intermediate goods (Lommerud et al., 2009). A large literature has examined the macroeconomic effects of unions on labor market outcomes, such as Pissarides (1986) and more

[2] The modern two part tariff literature begins with Oi (1971). See Vettas (2011) for a survey.