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U.S. air carriers and work-rule constraints – Do airlines employ an allocatively efficient mix of inputs?

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ABSTRACT

Past research on the allocation of factor inputs for the airline industry suggests an overutilization of labor relative to other inputs immediately following deregulation. This study argues rigid work rules in conjunction with productivity improvements of nonlabor inputs may create an incentive for carriers to under-invest in labor relative to nonlabor inputs. Findings derived from estimating a long-run shadow cost function for this industry suggest that airlines over-employ non-labor inputs relative to labor. Simulations suggest potential savings ranging from 13 to 14 percent derived from satisfying the conditions of allocative efficiency for carriers in the study's sample.

1. Introduction

Deregulation of the airline industry in 1978 has been a major success in terms of generating lower prices and improved service for consumers, and productivity gains for airlines. Airline deregulation enhanced rivalry in the industry, forcing legacy carriers to pursue innovations such as introducing hub and spoke networks and investing in larger, more fuel efficient aircraft. Moreover, the productivity gains realized by airlines have continued well beyond the first few years of deregulation. Bitzan and Peoples (2014) estimate an average 2.5 percent productivity gain per year in the airline industry since 1993, largely as a result of higher load factors and increasing stage lengths.

Despite the success of deregulation in enhancing the efficiency of the airline industry, the increased competitive pressure that has led to increased efficiency has also resulted in a number of bankruptcies in recent years. In the last 10 years, each of the four largest U.S. carriers has declared bankruptcy. While a number of factors may account for the lack of financial success of airlines, including reduced demand after 9/11 and rising fuel costs, many observers believe that one of the major problems is low labor productivity caused by restrictive work rules. Although some have argued that these problems have disproportionately affected legacy carriers, recent evidence suggests these problems are not limited to legacy carriers.

In arguing that legacy carriers face bigger problems in this area, Severin Borenstein cites less restrictive work rules as a major advantage realized by low-cost carriers, "'They get much more productivity out of their workers," he argues. "The jobs are defined more broadly and their workers tend to be able to cover more of the work load"' (Caitlin Kenney, NPR 2011). On the other hand, in a recent letter to employees, Southwest CEO Gary Kelly wrote: "The sloth like industry you remember competing against is now dead and buried. We fought them and we won. Now, the enemy is our own cost creep, our own legacy-like productivity, and our own inefficiencies" (Caitlin Kenney, NPR 2011). Moreover, other recent evidence suggests that labor costs between low cost carriers and legacy carriers are converging. Tsoukalas, Belobaba, and Swelbar (2008) find that the average difference in labor cost per available seat mile between legacy carriers and low cost carriers decreased from 1.2 cents in 2000 to 0.3 cents in 2006. The authors suggest that bankruptcy and the threat of bankruptcy has allowed legacy carriers to negotiate more favorable labor contracts, while increasing labor seniority and slower growth have contributed to higher labor costs for the low cost carriers.

Even though legacy costs are converging to levels resembling those achieved by low cost carriers, as illustrated in the recent bankruptcy case of American Airlines, restrictive work rules and labor productivity are still major issues. Recently, in federal bankruptcy court, American Airlines requested that its labor contracts with unions be voided (Associated Press, March 27 2012). American

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says that its current labor contracts reduce its ability to pursue new markets and opportunities (D.R. Stewart, Tulsa World 2012). As an example, a "scope clause" in the current labor contract American has with its pilots limits the use of fuel efficient jets used by regional carriers (D.R. Stewart, Tulsa World 2012). These anecdotes suggest that it is likely that U.S. air carriers use an inefficient mix of factors of production as a result of such work rules.

At first glance, it seems obvious that airline work rules promote a business environment such that airlines have an incentive to use too much labor relative to other inputs such as fuel, capital, and materials (Kumbhakar, 1992). By placing limits on the tasks a particular type of labor can perform, work rules force airlines to hire additional labor to perform the other tasks that a particular type of labor is restricted from doing.

However, while work rules are likely to force airlines to use more labor than they would without such work rules with everything else constant, they do not necessarily result in airlines using more labor *relative to other inputs*. Whether airlines use more or less labor relative to other inputs is an empirical question. On the one hand, work rules may prevent airlines from substituting labor-saving technologies for labor, resulting in an overuse of labor relative to other inputs. On the other hand, by increasing the costs of utilizing labor due to reductions in labor productivity, work rules may force airlines to increase their substitution of other factors for labor, resulting in an underuse of labor relative to other inputs. This paper will examine the allocation of labor relative to other inputs to answer two questions: 1) do airlines employ an optimal mix of labor relative to other inputs? and 2) if not, do they employ too much labor or too little labor relative to other inputs?

Section 2 of the paper presents a theoretical and empirical model of firm cost minimization that allows for the possibility that firms employ an allocatively inefficient mix of inputs. Specifically, we use an approach developed by Atkinson and Halvorsen (1984) that assumes firms minimize "shadow costs", taking into account a different price paid for labor and non-labor services in comparison to their market prices. Moreover, we discuss airline work rules, and how such work rules are likely to alter the "shadow price" of labor and other inputs. Subsequently, we present empirical results, showing our test for allocative efficiency and comparing costs and input demands to efficient allocation of resources. Finally, we discuss the implications of these results for airlines and their prospects for success as work rules are changed.

2. Allocative efficiency in the airline industry

A major challenge airline companies encounter in their attempt to provide efficient service is the constraint on their ability to use an optimal mix of labor relative to non-labor inputs. Constraints arise, in part, from government enforcement of scheduled hours of flight service and from adherence to union negotiated work rules. The US Federal Aviation Administration (FAA) enforces federal aviation regulations (FAR) on duty time for flight crews as a safety precaution.[1] Limitations on consecutive hours of service for pilots and copilots are intended to avoid air accidents attributable to fatigue. Hours of service regulations also apply to flight attendants, as enforcement of required minimum flight attendant crew sizes is intended to assist in addressing cabin safety-related responsibilities.

Regional and national airlines operate under FAR part 121. Rules outlined in that section of the FAR provide the framework for establishing maximum hours of scheduled flight service and duty time for pilots and flight attendants. For instance, in accordance with these regulations airline pilots are only permitted to fly 8 h in a 24 h period, 30 h in 7 days, 100 in a month, and up to 1000 h in a calendar year. FAA regulations limit airline flight attendants servicing domestic flights without assistance from additional attendants to no more than 14 consecutive hours of scheduled duty period, followed by a rest period of at least 9 consecutive hours. Long scheduled duty periods of more than 14 h and less than 16 h are allowed if the flight includes at least one additional attendant. Attendants can be assigned duty times of more than 18 h, but no more than 20 h if the scheduled duty period includes one or more flights that land or take-off outside the 48 contiguous states and the District of Columbia. The rest period for these restrictions require at least 12 consecutive hours.

While FAA regulations impose maximum hours of flight duty restriction, unions can negotiate more restrictive rules for flight crews. For instance, newly negotiated work rules for Delta, Alaska, and American Airline pilots set maximum scheduled hours at 84, 85 and 87 h per month, respectively.[2] In contrast, low-cost carrier Spirit enforces the maximum 100 h per month allowed by FAA regulations. Because the maximum number of hours a Delta, Alaska or American pilot can work in a month is relatively low compared to pilots at low cost carriers (LCCs) such as Spirit, these legacy carriers are required to hire more people to work in the cockpit for the same amount of actual flight time as smaller crews for Spirit.

In addition to hours of service rules, other negotiated terms of collective bargaining agreements may also prevent air carriers from employing an efficient mix of flight-crew labor and other inputs. One of these is in the "scope provisions" that have been included in pilot collective bargaining agreements.[3] Scope provisions often limit the number of large jets flown by regional partners or limit the ability of carriers to enter into code sharing agreements with other carriers. Such provisions may force carriers to operate services that would be performed more economically by other carriers.

Finally, other rigid work rules for flight crews impose additional costs, including those associated with deadheading crews, costly and lengthy layovers, and employment of additional crews for long distance international flights. Deadheading refers to crew members that are not actively performing work duties being transported free of charge. This most often happens when airline crews are located in the wrong place and need to travel to take up their duties. In addition to the opportunity cost associated with displacing paying customers on a flight with non-paying personnel, carriers incur expenses associated with crews staying overnight in a location other than their home base. Reports indicate that pilots work an additional 150 h per month doing nonflight duties, showing that the actual wages paid to crews do not accurately depict their productivity (BLS, 2012).[4] Rather, the excess cost accruing from work rules on staffing of crews and on rules governing travel expenses for flight personnel contribute to high pay relative to credit for hours flown.[5]

Not only do air carriers face constraints in their utilization of flight crew members, but they also face important constraints

[1] Duty time is the period of elapsed time between reporting for an assignment involving flight time and release time from that flight assignment.

[2] Source, American Airlines, http://www.restructuringamr.com/our-people-apa-kt3.asp.

[3] Source: http://www.restructuringamr.com/our-people-apa-kt2.asp.

[4] Source: http://www.bls.gov/ooh/transportation-and-material-moving/airline-and-commercial-pilots.htm.

[5] Gershkoff (1989) estimates non-duty flight pay relative to total flight hour reaching as high as 17 percent. FAR requirements on rotating crews for long −haul domestic and international flights are another source of additional labor cost associated with work rules.