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Does Employee Ownership Change Employee Attitudes and Behavior? An Econometric Case Study*

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Abstract

This paper provides the first econometric evidence on changes in attitudes and values of workers over time as their firm transitions from a family-owned to a 100-percent employee-owned firm. We use a decade-long longitudinal employee survey combined with personnel data which cover the firm's transition to full employee ownership, and estimate a fixed effect model which allows for the heterogeneous effect of employee ownership on attitudes and values for new entrants and incumbent. The fixed effect estimates indicate that as the transition to a 100-percent employee-owned firm ensues, new entrants as compared to incumbent became more profit-oriented; appreciated profit sharing more; saw management in a more positive light; valued the act of helping others more; and more committed to the firm. The observed attitudinal changes toward ownership culture among new entrants which are statistically significant are not due to common shocks to all employees at the firm. We interpret them as new entrants adapting to the transition of the firm toward full employee ownership better than incumbent workers because: (i) new entrants joined the firm, knowing the firm's transition to a 100-percent employee-owned firm and hence were more open to a new way of working and thinking; and (ii) new entrants, being younger than incumbent by almost a decade, can adapt to changes in the workplace more effectively.

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1. Introduction

There is a long and rich history of research on the economic effect of employee ownership (see, for instance, Bloom and Van Reenen, 2011 for an authoritative literature review). Earlier cross-sectional studies, using a large representative survey of firms/establishments, show cross-sectional estimates on the relationship between productivity and the incidence of shared capitalism. Such correlational evidence can point to a causal effect yet may also simply reflect an association between unobserved firm characteristics (e.g., managerial quality, corporate culture) and the incidence of shared capitalism. To control for such time-invariant firm-specific confounders, scholars obtain firm-level panel data and provide fixed effect estimates on the productivity effect of the incidence of shared capitalism—a major step toward causal evidence (e.g., Jones and Kato, 1995 on employee ownership and Kruse, 1993 on profit sharing). More recently detailed econometric case studies of firms/establishments provide compelling evidence on the productivity change before and after the introduction of shared capitalism (e.g., Boning, et al., 2007; Hamilton, et al., 2003; Burgess, et al., 2010).

In spite of the long and rich history of research, however, there is still only limited evidence on specific mechanisms behind the positive productivity effects of employee ownership. In particular we have no rigorous direct evidence on one of the most often discussed mechanisms, the goal alignment effect. Employee ownership ties the financial wellbeing of employees with the financial wellbeing of the firm. Such financial interest alignment is expected to turn regular employees into employee owners who think like an

owner, and act like an owner, or embrace ownership culture. Such employee owners work harder and smarter, and collaborate more sincerely and effectively with their colleagues who are now co-owners.

A major methodological challenge in providing reliable evidence on this transformation of regular workers into employee owners is the lack of long longitudinal data on employee attitudes and underlying values. In order to uncover changes or lack thereof in attitudes and values of individual workers as the firm transitions from a conventional firm to an employee-owned firm, we will need to observe attitudes and values of the same workers repeatedly as the transition of the firm ensues. As discussed below, the transformation of regular workers into employee owners is likely to be a long process. The longitudinal data will need to be long, say a decade. Such long longitudinal data on employee attitudes and values are rare.

Fortunately we are given an opportunity to analyze such data thanks to the generosity of Carris Reels, our case firm. Specifically we analyze the data by using a fixed effect model to control for all unobserved time-invariant characteristics of workers such as innate ability and dispositions. Furthermore, the fixed effect model approach allow us to identify changes in attitudes and values of individual workers over time separate from changes in the composition of its labor force with different attitudes and values.

However, the fixed effect estimates may be conflated with the effect of shocks to all workers at Carris that are unrelated to employee ownership. To account for such shocks, we divide all employees into two groups, new entrants and incumbent workers at the time of each survey, and test if those two groups of workers change their attitudes and

values differently over the same transition period toward full employee ownership. Any statistically significant difference in changes in attitudes and values between the two groups is not caused by the afore-mentioned common shocks to all workers at the firm. Our focus on the division between new entrants and incumbent workers is based on the assumption that as compared to incumbent workers, new entrants are more likely to adapt to the process of the transition toward full employee ownership better and show more significant changes in their attitudes, behavior and underlying value system. We justify the assumption on two grounds. First, it is plausible that new entrants joined the firm, having known that it has been transitioning from a family-owned to a 100-percent employee-owned firm. As such, they may be more open to the transition process and more amenable to a new way of thinking and working. Second, new entrants are found to be substantially younger than incumbent workers. The literature on age and adaptations provides evidence on the negative relationship between age and adaptations to changes in the workplace (Niessen, Swarowsky, and Leiz, 2010).

In sum, we fill an important gap in the literature on employee ownership and HPWS by providing rare econometric evidence on changes in attitudes and underlying values of workers under employee ownership and shedding light on mechanisms behind the productivity effect of employee ownership and HPWS.

The paper is organized as follows. In the next section we introduce our case firm, Carris, with particular focus on the process of its transition from a family-owned to a 100-percent employee owned firm. In Section 3 we describe the data and our empirical strategy, and the results are presented in Section 4. The concluding section follows.

2. Carris

Carris Reels manufactures wood, plastic and metal reels, referred to as spools and bobbins, to hold steel wire and cable and needed tubing and bolts for its reels. With more than one hundred forty million dollars in annual sales, it has manufacturing and assembly plants across the US (Arkansas, California, Connecticut, Indiana, North Carolina, Oregon, Vermont, Virginia and Texas), Mexico and Canada (Alberta, Quebec and Saskatchewan). Carris has seven recycling centers (three in the US, three in Canada and one in Mexico).

In 1951, Henry Miller Carris founded Carris Reels, Inc. in Rutland, Vermont, to manufacture plywood reels. In 1980, his son William H. Carris (Bill) took over with the goal of employee ownership and full employee participation. In December 1994, Bill Carris shared with his employees his vision for making Carris a 100% employee-owned and governed company, to “give” voice to employee-owners in the “distribution of wealth and the overall direction of the organization,”

The transfer of ownership to employees that was designed to take place over a 10 to 15 year period would be at 50% of market value with allocation of the gift portion first. Bill Carris thought that doing the transfer this way would build confidence and convey his trust in employees. 1995 was a year of special meetings throughout Carris with employees to build understanding of employee ownership and to plan for the ESOP. The *Long Term Plan* Steering Committee (LTPSC) comprised of managers and employees designed the ESOP and its allocation. The LTPSC¹ made sixteen of the eighteen required

¹ In 1996, a similarly comprised group formed the Corporate Steering Committee.

decisions. Bill Carris made two: one person/one vote and corporate tithing. In July 1995, employees voted on their preferred allocation formula. The ESOP Trust document was signed December 12, 1995 with an effective date of January 1, 1995 so that stock could be issued in March 1996, for 1995 following the required valuation. This encouraged the timing for the Wave 1 Survey to be conducted in February 1996 a month before the stock certificates were anticipated to be issued.

Since becoming employee owned (2008) and governed (2014) Carris Reels has seen its most profitable years and purchased two well-established reel companies: J. Hamelin in Canada and Lone Star Reel in Texas. In 2010, 39 ESOP accounts were more than \$100,000 and 0 were over \$200,000. In 2015, 168 accounts were more than \$100,000 and 67 were more than \$200,000. In early 2017, it was reported that the 401K provider did a study that showed that 80% of Carris employees are looking good for retirement. In 2018, 35% of participants—188 out of 537—had more than \$100,000 in their ESOP accounts, with a few over \$400,000.

In 2018, Carris employed 750 people (200 of these in Mexico and Canada). The average age of employees is forty four; 18% have been with the company more than fifteen years and 23% have less than one year of service; 80.7% of hourly workers earn between \$12.70 and \$23.90 or 91.3% between \$11.70 and \$23.90 with an average wage of \$14.71; total compensation includes a monthly production incentive, gainsharing (up to 10% of pay), profit sharing (18.6% of profits), stock, retirement plan (funded at 4% of pay), health insurance, and vacation/personal days.

There are over 5500 stand alone ESOPs² in the US such as Carris. What makes Carris as a corporation and as an ESOP quite unique is its governance structure. Since 1994 through its *Long Term Plan*, Carris has been on record to involve employee owners in governance. Today, throughout Carris, employee owner roles are specifically named and structured into all facets of formal governance and decision-making through the Corporate Steering Committee, the ESOP Trustees and the Corporate Board of Directors. Employee owners are also directly involved in their site committees such as ongoing Safety, Strategic Planning and Charitable Giving. Through the Carris Corporate Foundation's local site Charitable Giving Committees, employee owners have shared their corporate wealth, crossing the five-million-dollar mark to non-profits.

The Corporate Steering Committee (CSC), formed similarly as the LTPSC, brings the whole internal Carris system into the room for its twice a year meetings at corporate headquarters in Proctor, Vermont over a 3-day period. From the beginning of its transition to employee ownership and specifically through the work of the CSC, Carris has often repeated its goal for transparency. At each CSC meeting those present review detailed corporate and site reports and plans for sales, finances, human resources, safety, strategic planning as well as those from ad hoc committees. Information is discussed and decisions are made, often using Carris' preferred method—consensus. The CSC consists of elected employee owner representatives (1 per site and at larger sites 1 for each 50 employees) site managers, corporate managers and a board representative (currently the board chair).

² For more information, see the National Center for Employee Ownership website: <https://www.nceo.org/articles/esops-by-the-numbers#1> accessed June 13, 2019.

A primary focus of the CSC is support for employee owner participation and governance and it is directly involved in planning and implementing long-term corporate strategy and goals. On the CSC, the elected employee owner representatives have three year terms and they may be re-elected. Following CSC review in 2006, they became compensated.

The CSC is responsible for choosing ESOP Trustees (voted by the Carris Board of Directors) and directing the ESOP Trustees regarding the election of the Board of Directors. Members hold agenda planning and informational meetings at their sites prior to the CSC meeting. They are expected to engage fully and candidly in discussions during the meetings. Following the meetings, there are debriefings and reporting at the sites on CSC discussions. Representatives explain the decisions and actions taken at the meetings. Early in their work, the CSC arrived at the insight that among their primary responsibilities was being ‘keeper of the flame’ and the guiding spirit of the Carris efforts toward employee ownership and governance.

Two managers and three employee owners are internal ESOP Trustees. The employee owners are compensated and serve six year terms. Following extensive research and discussion, the CSC developed a layered screening process for selecting ESOP Trustees and a detailed two year curriculum regarding ESOPs, finances (inside and outside the company) and delineation of fiduciary responsibilities to insure that the ESOP Trustees could meet their obligations to Carris ESOP participants. ESOP Trustees oversee the Employee Stock Ownership Plan, its fair market value, operation and regulation compliance. They hire the valuator and accept the report on the value of the company (from which employee owner share value is derived) and engage an accounting firm for

the ESOP and its official record-keeper. At Carris, the ESOP Trustees attend CSC, ESOP and monthly Strategic Planning Meetings.

Early in the transition to employee ownership and governance, the Carris Board of Directors delegated some of its authority, in the corporation and its bylaws, to the CSC: specifically, electing the Board of Directors and selecting ESOP Trustees. The Carris Board of Directors holds the highest legal authority, overseeing the company and is empowered through the company by-laws. Representing the shareholder—i.e. the Carris Financial Corporation (CFC) ESOP which owns 100% of the stock of the company, it adopts the Carris Strategic Plan and is responsible to ensure resources to implement it; elects officers and appoints the corporate President/CEO; approves budgets and acquisitions; and accepts audits. The Carris Board of Directors has the duties of: loyalty, care and obedience. These duties have been emphasized in discussions of employee owners becoming members of the Board of Directors throughout Carris and at CSC and local site meetings.

In May 2014 two non-executive (one hourly and one salaried) Carris employee owners joined the Board of Directors as full voting members; they attend CSC meetings as non-voting members. Having employee owners on the Board of Directors was set as a criterion and goal for 100% employee governance at the very beginning of the transition and ESOP planning process. Having employee owners on the Board of Directors was seen as completing the transition to 100% employee ownership and governance.

3. Data and Empirical Strategy

Carris granted us access to their longitudinal personnel data combined with data from the longitudinal survey of their employees. As shown in Figure 1, the employee survey was conducted three times, 1996, 1998, and 2007. Following the announcement that Bill Carris shared his vision for making Carris a 100% employee-owned and governed company in December of 1994, the first wave of the employee survey, the 1996 Survey, was conducted in February of 1996, and a small supplementary survey was conducted in December of the same year. Two years later, the second wave of the survey, the 1998 Survey, was conducted in November of 1998. A decade later the last and third wave, the 2007 Survey was completed in January of 2007. All three waves of the Employee Survey include a common set of questions concerning each worker's attitudes and behavior as well as the Rokeach Value Survey (RVS). In addition, some additional common questions are added to the second and third wave. The Rokeach Value Survey was developed by Milton Rokeach. Its purpose in this study was to measure worker's values and value changes as these relate to the world of work (Rokeach, 1973). Those taking the surveys were asked to rank the 18 terminal values (desirable end-states of existence), followed by the 18 instrumental values ((preferable modes of behavior) according to their order of importance. This instrument has been widely used in the measurement of values (Mayton et al. 1994).

All three waves of the survey enjoyed an impressive response rate of around 70 percent except for the short supplement to the first wave (a little over 40 percent). Using employee IDs, we were able to link all three waves of the survey, resulting in novel worker-level panel data which reveals changes (or lack thereof) in attitudes, behavior and

underlying value system of workers who have gone through a remarkable transition of their firm from a family-owned to an employee-owned firm.

To describe changes in employee attitudes, behavior, and underlying value system systematically, we estimate the following baseline model:

$$(1) \quad Y_{it} = \alpha + \beta_1 \text{year1998}_t + \beta_2 \text{year2007}_t + (\text{individual worker fixed effects}) + \varepsilon_{it}$$

where Y_{it} = Dependent variable designed to capture an employee attitude/behavior/values of worker i in year t ($t = 1996, 1998, \text{ and } 2007$); $\text{year1998}_t = 1$ if $t = 1998$, 0 otherwise; $\text{year2007}_t = 1$ if $t = 2007$, 0 otherwise; and $\text{year1996}_t = 1$ if $t = 1996$, 0 otherwise which is an omitted reference category.

By taking advantage of the longitudinal nature of our data, we estimate fixed effect models with individual worker fixed effects which control for all time-invariant worker characteristics including both observed and unobserved (e.g., gender, education, cohorts as well as innate ability/dispositions). The estimated coefficient on year1998_t , β_1 , captures changes (or lack thereof) in employee attitudes/behavior/values from 1996 to 1998 for the same worker. Likewise, the estimated coefficient on year2007_t , β_2 , captures changes (or lack thereof) in employee attitudes/behavior/values from 1996 to 2007 for the same worker. We expect the estimated coefficients on year2007 to be more significant than those on year1997 . First, the transition from a family-owned to a 100-percent employee-owned firm was a gradual process and it took over a decade to complete the process at Carris (see Figure 1). We hypothesize that experiencing only an early stage of the transition, say the first few years of the transition, may not be sufficient for a worker to start embracing ownership culture or “feel and think like an owner.” Second, changes

in attitudes and values may be inherently a slow process, and may appear only with a considerable amount of lag.

As a reference point, we also report the OLS estimates of β_1 and β_2 (unconditional changes in employee attitudes, behavior and values) which include changes due to labor force compositional changes as well as within- worker changes.

A potentially serious shortcoming of our baseline model is that the estimated coefficients on year1998 and year2007 may be also picking up the effects of shocks to all workers at Carris that are unrelated to employee ownership. As such, we cannot rule out the possibility that we conflate the effect of employee ownership on worker attitudes, behavior and values with the effect of such shocks to all workers at Carris which manifest in changes in worker attitudes, behavior, and values. To account for this, we augment the baseline model with two interaction terms:

$$(2) \quad Y_{it} = \alpha + \beta_1 \text{year1998}_t + \beta_2 \text{year2007}_t + \gamma \text{new_entrants}_{it} \\ + \lambda_1 \text{new_entrants}_{it} * \text{year1998}_t + \lambda_2 \text{new_entrants}_{it} * \text{year2007}_t \\ + (\text{individual worker fixed effects}) + \varepsilon_{it}$$

where $\text{new_entrants}_{it} = 1$ if worker i is a new entrant to Carris (defined as having less than one year of tenure at Carris) in year t , 0 otherwise.

As shown in Table 1, the mean value of new_entrants_{it} (=1 if worker i is a new entrant to Carris in year t , 0 otherwise) is 0.259, suggesting that at the time of the survey one in four workers had less than one year of tenure at Carris.

The estimated coefficient on the interaction term involving new_entrants_{it} and year1998_t , λ_1 , captures any changes in attitudes, behavior and values over 1996-1998 for new hires at the time of the survey as compared to incumbent workers. Likewise, λ_2

indicates any differences in changes in attitudes, behavior and values over 1996-2007 between new entrants and incumbent workers. In other words, the estimated coefficients, λ_1 and λ_2 , pick up any changes in attitudes, behavior and values of new entrants to Carris as the transition of Carris from a family-owned to a 100-percent employee-owned firm proceeds, which are not conflated with the effects of other shocks to all workers at Carris. We acknowledge that it is possible that some shocks hit new entrants and incumbent workers differently, and hence that our fixed effect estimates of Eq. (2) may be still subject to omitted variable bias due to such heterogeneous shocks.

We hypothesize that new entrants are more likely to adapt to the process of the transition of their firm toward full employee ownership better and show more significant changes in their attitudes, behavior and underlying value system. First, it is likely that new entrants joined Carris, having known that Carris has been transitioning from a family-owned to a 100-percent employee-owned firm. As such, they are more open to the transition process and more amenable to a new way of working. Second, we use our data and calculate the mean value of age for new entrants and incumbent workers. The average age of new entrants is 32.8, while the average age of incumbent workers is 39.7. Niessen, Swarowsky, and Leiz (2010) analyze data from a longitudinal survey of 117 employees before and after changes in the workplace, and find evidence that age is negatively related to adaptations to changes in the workplace. It is plausible that new entrants, being considerably younger than incumbent workers, adapt to the transition process toward a 100-percent employee ownership more effectively than incumbent workers.

For Y_{it} , we consider a variety of measures indicating how much an employee embraces ownership culture. First, each respondent to the survey is asked to indicate on the 5-point Likert scale the degree to which he/she agrees or disagrees on the following statement, “Profit is the key measurement as to how well our company is doing.” As shown in Profit-orientation_{it} in Table 1, the mean value of Profit-orientation_{it} is 3.999, suggesting that the average worker agrees with this statement. We consider this variable a direct measure of worker’s embracing of ownership culture. The more the worker agrees with this statement, the more he/she is aware of the importance of profit as a key objective of the firm or is more profit-oriented. We hypothesize that the more the worker agrees with this statement, the more he/she embraces ownership culture (feels and acts like an owner).

We further hypothesize that the worker’s profit orientation will manifest in his/her understanding and appreciation of profit sharing. When he/she starts understanding the importance of profit as a key objective of the firm, the worker will also start feeling that profit sharing (linking worker compensation to profit) makes sense and hence appreciating profit sharing. The 1998 Survey and the 2007 Survey ask each respondent the degree of his/her satisfaction with profit sharing on the 5-point Likert scale (1=very dissatisfied to 5=very satisfied), from which we create Satisfied with PSP_{it}. Its mean value is 3.935, suggesting that the average respondent is satisfied with profit sharing.

When embracing ownership culture, and thinking like an owner, the worker may understand and appreciate the challenging role of supervisors and hence start seeing them in a more positive light. To this end, we consider Fair supervisor_{it}, each worker’s degree of agreement/disagreement on “I think supervisors treat everyone fairly at this site.”

Likewise, we also consider Satisfied with management_{it}, each worker's degree of satisfaction with plant and production managers. The mean values of Fair supervisor_{it} and Satisfied with management_{it} are 3.092 and 3.682 respectively, suggesting that the average worker's assessment of their bosses is moderately positive (Table 1).

One of the most important changes in the workplace in industrialized countries in the last three decades or so is the emergence of a new employment system consisting of clusters of complementary work practices (often called the High Performance Work System, HPWS). A key element of the HPWS is the use of teamwork facilitated by employee stock ownership and other group incentive mechanisms which ties the financial wellbeing of individual workers to the organizational wellbeing (such as the financial wellbeing of the firm).³ The literature on the HPWS provides evidence that there is a considerable amount of lag in the effects of employee ownership on organizational performance (Jones and Kato, 1995 and Kato and Morishima, 2002). A possible reason for the long gestation period is that behavioral changes among workers that are more conducive to the HPWS in general and teamwork in particular require changes in the underlying value system of workers toward cooperation. Thus we consider it , each worker's assessment of the importance of (working for the welfare of others) among a set of 18 items in the Rokeach Value Survey (1=least important to 18=most important) from 1996. Our hypothesis is that employee ownership causes workers to raise their

³ What is considered the HPWS varies somewhat among scholars. Our description of the HPWS is close to Kochan and Osterman (1994), Ichniowski, Shaw and Prennusi (1997), Appelbaum, et. al. (2000), and Kato (2014).

assessment of the importance of but not immediately. As shown in Table 1, the average assessment of the importance of is 10.15 ((1=least important to 18=most important).

Finally we examine changes in the level of commitment of workers to the firm by considering two variables, Leave for pay_{it} =the worker's degree of agreement/disagreement (1=strongly disagree to 5=strongly agree) on "I am looking for another job which will pay more money" and Good match_{it}= the worker's degree of agreement/disagreement on "I think I fit in well here." Again the literature on shared capitalism and the HPWS postulates that employee ownership and other employee financial participation mechanisms foster the goal alignment between workers and the firm and hence enhance worker commitment (see, for instance, Jones and Kato, 1995). Thus we hypothesize that employee owners will show a decrease in Leave for pay_{it} and an increase in Good match_{it} as the transition of Carris from a family-owned to a 100-percent employee-owned firm proceeds. Table 1 shows that the mean value of Leave for pay_{it} is 2.774, suggesting that the average worker's assessment of this statement is neither agree nor disagree. The mean value of Good match_{it} is 3.937. The average worker thinks that he/she fits in well at Carris.

4. Results

Table 2 shows the OLS and fixed effect estimates of Eq. (1) and Eq. (2) with Profit-orientation_{it} as the dependent variable. The fixed effect estimates of the coefficients on y1998 and y2007 in Eq. (1) are negative and statistically significant at the 5 percent level, pointing to an overall negative changes in Profit-orientation among all workers at Carris during the transition from a family-owned to a 100-percent employee-owned firm

(for exposition, we omit subscripts from all variable names henceforth). As discussed in the last section, however, we ought not to interpret the negative coefficients on y_{1998} and y_{2007} as employee ownership making workers less profit-oriented. Some shocks that are unrelated to employee ownership might have made workers less profit-oriented. As shown in Figure 1, the transition period of 1996-2007 happened to be highly turbulent years for Carris. The general focus of workers at Carris might have been shifted toward stability and security of pay and employment rather than profit.

The estimated coefficients on $\text{new_entrant} * y_{1998}$ and $\text{new_entrant} * y_{2007}$ in the fixed effect estimates of Eq. (2) can be considered capturing changes in profit-orientation due to the transition toward an employee-owned firm apart from the aforementioned overall negative changes due to unobserved shocks to all workers. Most noteworthy is the positive and statistically significant coefficient on $\text{new_entrant} * y_{2007}$. The degree of profit-orientation fell by 0.279 from 1996 to 2007 for incumbent workers, while it rose by 0.332 ($=0.611-0.279$) for new entrants. The difference between incumbent workers and new entrants (0.611) is statistically significant at the 10 percent level, supporting our hypothesis that new entrants adapt more effectively to the transition process toward 100 percent employee ownership than incumbent workers, become more profit-oriented and embrace ownership culture more readily. The size of the estimated coefficient, 0.611, is economically meaningful, considering the mean value of Profit-orientation is 3.999.

Next, to see if the worker's profit orientation will manifest in his/her understanding and appreciation of profit sharing, and greater satisfaction with profit sharing, we estimate Eq. (1) and Eq. (2), using Satisfaction with PFP as the dependent variable. The results are shown in Table 3. This question was not included in the first

wave, and we use only the second and last wave. The estimated coefficient on y_{2007} in the fixed effect estimation of the baseline model, as shown in column (2) of the Table, is positive yet small and not statistically significant even at the 10 percent level, suggesting that overall there is no change in employee satisfaction with profit sharing over 1998-2007. However, as shown in column (4), the estimated coefficient on $new_entrant*y_{2007}$ in the fixed effect estimation of the augmented model is positive and large, and significant at the 1 percent level, lending credence to our hypothesis that new entrants adapt more effectively to the transition process than incumbent workers, become more profit-oriented, and thus understand and appreciate profit sharing. Again, the size of the estimated coefficient, 0.652, is hardly trivial, with the mean value of Satisfied with PSP being 3.935.

The next two tables, Tables 4 and 5 present the results with Fair supervisor and Satisfied with management as the dependent variables. We hypothesize that the interest of workers becomes more aligned with the interest of the firm as the transition to full employee ownership proceeds. Such workers who are more aligned with management understand and appreciate the complex tasks of management, resulting in an increase in Fair supervisor and Satisfied with management. The estimated coefficients on y_{2007} in the baseline model are positive yet small and not statistically significant even at the 10 percent level. Thus there is no evidence for the overall improvement in worker assessment of management over 1998-2007. Nevertheless the estimated coefficients on $new_entrant*y_{2007}$ in the fixed effect estimation of the augmented model are positive and much larger, and statistically significant at the 10 percent level for Fair supervisor as the dependent variable and not too far from being significant at the 10 percent for

Satisfied with management. As the transition toward full employee ownership ensues, new entrants as compared to incumbent start seeing management in a more positive light. Employee ownership fosters not only vertical goal alignment between labor and management but also horizontal goal alignment between coworkers. Embracing ownership culture can mean that employee owners start seeing each other not only as coworkers but also as co-owners who share the same destiny. In other words, as the transition from a family-owned to a 100-percent employee-owned firm ensues, workers start understanding and appreciating the importance of helping each other in the workplace. Fortunately, all three waves include the Rokeach Value Survey (RVS) instruments, from which we construct a new variable, (working for the welfare of others) = 1 if the respondent ranks the least important among the 18 value items; = 2 if the respondent ranks the second least important; -----; = 18 if the respondent ranks the most important.

Table 6 presents the OLS and fixed effect estimates of Eq. (1) and Eq. (2) with as the dependent variable. The estimated coefficient on y_{2007} in the fixed effect estimation of the baseline model is positive and statistically significant at the 5 percent level, suggesting that the average employee including both new entrants and incumbent workers considered more important as the transition proceeded from 1996 to 2007. The magnitude of the estimated coefficient suggests that the ranking of rose by one from 1996 to 2007. The estimated coefficient on $new_entrant*y_{2007}$ in the fixed effect estimation of the augmented model is positive and much larger, and statistically significant at the 1 percent level. For the new entrants, the ranking of rose by more than 6, while rising only by 1 for the incumbent workers, which is consistent with our

hypothesis that new entrants as compared to incumbent adapt to the transition process from a family-owned to a fully employee-employed firm more effectively, and shift their value system toward cooperation more.

As the transition toward full employee ownership ensues, the alignment of interest between workers and the firm becomes stronger. Our final hypothesis is that worker commitment to Carris will rise as the transition proceeds. The second and third wave of the Survey includes two questions which help us shed light on the last hypothesis. First each respondent is asked to respond using the 5-point Likert scale to whether he/she agrees or disagrees on “I am looking for another job which will pay more money,” from which we construct, Commitment = 1 if the respondent strongly disagrees on the statement; -----; = 5 if the respondent strongly agrees on the statement. Second, we construct Good match = 1 if the respondent strongly disagrees on “I think I fit in well here”;-----; = 5 if the respondent strongly agrees on “I think I fit in well here.”

The OLS and fixed effect estimates of the baseline and augmented models with Commitment and Good match as the dependent variables are presented in Tables 7 and 8 respectively. The baseline model estimates indicate that there is no significant change in Commitment and Good match overall over 1998-2007. However, the fixed effect estimate of the coefficient on new_entrant*y2007 in the augmented model is negative and not too far from significant at the 10 percent when Commitment is the dependent variable (Table 7), and positive and significant at the 1 percent level when Good match is the dependent variable. Again we find evidence that as the transition toward full employee ownership ensues, new entrants as compared to incumbents become more committed to

the firm and feel they fit well at Carris. The size of the coefficient is neither implausible nor trivial---change in the 5-point Likert scale by a little less than one.

5. Conclusions

We have provided the first econometric evidence on changes in attitudes and values of workers over a decade as our case firm transitions from a family-owned to a 100-percent employee-owned firm. In so doing we have taken advantage of our access to our case firm's longitudinal personnel data combined with data from the longitudinal employee survey (three waves) which cover the over-a-decade of the firm's transition to full employee ownership. We have used a fixed effect model to control for all unobserved time-invariant characteristics of workers such as innate ability and disposition. Furthermore, the fixed effect model approach has helped us identify changes in attitudes and values of individual workers over time separate from changes in the composition of its labor force with different attitudes and values.

However, the fixed effect estimates on the effect of employee ownership on employee attitudes and values may be conflated with the effect of shocks to all workers that are unrelated to employee ownership. To account for such shocks, we have divided all employees into two groups, new entrants and incumbent workers at the time of each survey, and have tested if those two groups of workers change their attitudes and values differently over the same transition period toward full employee ownership. Any statistically significant difference in changes in attitudes and values between the two groups is not caused by the afore-mentioned common shocks to all workers at the firm. We have hypothesized that as compared to incumbent workers, new entrants are more apt

to adapt to the process of the transition toward full employee ownership better and show more significant changes in their attitudes, behavior and underlying value system. First, we have postulated that it is likely that new entrants joined the firm, having known that it has been transitioning from a family-owned to a 100-percent employee-owned firm. As such, they may be more open to the transition process and more amenable to a new way of working. Second, new entrants are found to be substantially younger than incumbent workers. The literature on age and adaptations reports evidence that age is negatively related to adaptations to changes in the workplace.

We have found that as the transition from a family-owned to a 100-percent employee owned firm ensues, new entrants become more profit-oriented, understand and appreciate profit sharing more, and view management in a more positive light than incumbent workers. In other words, as the transition proceeds, new entrants embrace ownership culture or think like an owner more so than incumbent workers. Moreover, There is a significantly greater rise in the ranking of “being to others” as a preferred mode of behavior among new entrants than among incumbent workers. Finally commitment to the firm grows more among new entrants than among incumbent workers. Note that all these heterogeneous effects of the transition toward a 100-percent employee-owned firm for new entrants and incumbent workers are separate from the effects of shocks to all workers.

In sum, we have filled an important gap in the literature on employee ownership and HPWS---providing rare econometric evidence on changes in attitudes and underlying values of workers under employee ownership and shedding light on mechanisms behind the productivity effect of employee ownership and HPWS. External validity is, however,

an obvious concern for any econometric case study. There are two opposing considerations. First, Carris stresses the importance of employee governance in addition to employee ownership, and implements a variety of policies/practices to enhance employee voice. As compared to other employee-owned firms without such a strong focus on employee voice, our case can be said to yield greater embracement of ownership culture among employees. Second, most regular employees at Carris are relatively unskilled workers with limited education. As contrasted to other employee-owned firms with more educated and skilled labor force, our case can be considered yielding less embracement of ownership culture.

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Table 1 Summary Statistics

| VARIABLES | (1) N | (2) mean | (3) sd | (4) min | (5) max |
|---|----------|-------------|-----------|------------|------------|
| New Entrants _{it} | 2,803 | 0.259 | 0.438 | 0 | 1 |
| Profit-orientation _{it} | 1,437 | 3.999 | 0.944 | 1 | 5 |
| Satisfied with PSP _{it} | 950 | 3.935 | 0.934 | 1 | 5 |
| Fair supervisor _{it} | 950 | 3.092 | 1.284 | 1 | 5 |
| Satisfied with management _{it} | 951 | 3.682 | 0.973 | 1 | 5 |
| Helpful _{it} | 1,297 | 10.25 | 4.626 | 1 | 18 |
| Leave for pay _{it} | 940 | 2.774 | 1.250 | 1 | 5 |
| Good match _{it} | 951 | 3.937 | 0.859 | 1 | 5 |

Sources: Carris Company Employee Survey, 1996, 1998 and 2007 and Internal Personnel Data

Note: Robust standard errors in parentheses. Standard errors are clustered at the individual worker level.

*** p<0.01, ** p<0.05, * p<0.1

Table 2 Changes in Profit-Orientation from 1996

Agree/disagree (1=strongly disagree to 5=strongly agree) on the statement “Profit is the key measurement as to how well our company is doing”

| VARIABLES | (1) OLS | (2) Fixed Effects | (3) OLS | (4) Fixed Effects |
|--------------------|----------------------|----------------------|----------------------|-----------------------|
| y1998 | -0.129** (0.0529) | -0.158** (0.0698) | -0.146** (0.0619) | -0.199*** (0.0767) |
| y2007 | -0.0637 (0.0679) | -0.232** (0.103) | -0.121 (0.0752) | -0.279** (0.110) |
| new_entrant | | | -0.126 (0.109) | -0.298 (0.194) |
| new_entrant*y1998 | | | 0.111 (0.133) | 0.334 (0.286) |
| new_entrant*y2007 | | | 0.328* (0.169) | 0.611* (0.344) |
| Constant | 4.071*** (0.0422) | 4.118*** (0.0448) | 4.097*** (0.0465) | 4.152*** (0.0714) |
| Observations | 1,438 | 1,438 | 1,436 | 1,436 |
| R-squared | 0.004 | 0.019 | 0.006 | 0.027 |
| Number of idnumber | | 1,060 | | 1,058 |
| Worker FE | | YES | | YES |

Sources: Carris Company Employee Survey, 1996, 1998 and 2007 and Internal Personnel Data

Note: Robust standard errors in parentheses. Standard errors are clustered at the individual worker level.

*** p<0.01, ** p<0.05, * p<0.1

Table 3 Changes in Satisfaction with Profit Sharing (1=very dissatisfied to 5=very satisfied) from 1998

| VARIABLES | (1) OLS | (2) Fixed Effects | (3) OLS | (4) Fixed Effects |
|--------------------|----------------------|----------------------|-----------------------|----------------------|
| y2007 | 0.315*** (0.0588) | 0.136 (0.0848) | 0.229*** (0.0703) | 0.0447 (0.0990) |
| new_entrant | | | -0.211*** (0.0768) | -0.271 (0.213) |
| new_entrant*y2007 | | | 0.221 (0.138) | 0.652*** (0.251) |
| Constant | 3.836*** (0.0380) | 3.892*** (0.0267) | 3.920*** (0.0499) | 3.978*** (0.0880) |
| Observations | 950 | 950 | 948 | 948 |
| R-squared | 0.025 | 0.022 | 0.033 | 0.064 |
| Number of idnumber | | 844 | | 842 |
| Worker FE | | YES | | YES |

Sources: Carris Company Employee Survey, 1996, 1998 and 2007 and Internal Personnel Data

Note: Robust standard errors in parentheses. Standard errors are clustered at the individual worker level.

*** p<0.01, ** p<0.05, * p<0.1

Table 4 Changes in Fair Supervisors from 1998

Agree/disagree (1=strongly disagree to 5=strongly agree) on the statement “I think supervisors treat everyone fairly at this site”

| VARIABLES | (1) OLS | (2) Fixed Effects | (3) OLS | (4) Fixed Effects |
|--------------------|----------------------|----------------------|----------------------|----------------------|
| y2007 | 0.0284 (0.0875) | 0.117 (0.129) | 0.110 (0.101) | 0.0730 (0.151) |
| new_entrant | | | 0.230** (0.102) | 0.291 (0.330) |
| new_entrant*y2007 | | | -0.151 (0.230) | 0.798* (0.420) |
| Constant | 3.083*** (0.0501) | 3.055*** (0.0404) | 2.990*** (0.0648) | 2.936*** (0.140) |
| Observations | 950 | 950 | 948 | 948 |
| R-squared | 0.000 | 0.008 | 0.006 | 0.051 |
| Number of idnumber | | 844 | | 842 |
| Worker FE | | YES | | YES |

Sources: Carris Company Employee Survey, 1998 and 2007 and Internal Personnel Data

Note: Robust standard errors in parentheses. Standard errors are clustered at the individual worker level.

*** p<0.01, ** p<0.05, * p<0.1

Table 5 Changes in Satisfaction with Plan/Production Manager (1=very dissatisfied to 5=very satisfied) from 1998

| VARIABLES | (1) OLS | (2) Fixed Effects | (3) OLS | (4) Fixed Effects |
|--------------------|----------------------|----------------------|----------------------|----------------------|
| y2007 | -0.0523 (0.0694) | -0.0381 (0.102) | -0.0192 (0.0778) | -0.109 (0.117) |
| new_entrant | | | 0.0486 (0.0739) | -0.319 (0.276) |
| new_entrant*y2007 | | | -0.130 (0.207) | 0.367 (0.250) |
| Constant | 3.699*** (0.0365) | 3.694*** (0.0321) | 3.678*** (0.0485) | 3.804*** (0.105) |
| Observations | 951 | 951 | 949 | 949 |
| R-squared | 0.001 | 0.001 | 0.001 | 0.018 |
| Number of idnumber | | 843 | | 841 |
| Worker FE | | YES | | YES |

Sources: Carris Company Employee Survey, 1998 and 2007 and Internal Personnel Data

Note: Robust standard errors in parentheses. Standard errors are clustered at the individual worker level.

*** p<0.01, ** p<0.05, * p<0.1

Table 6 Changes in the Importance of HELPFUL (working for the welfare of others) in the Rokeach Value Survey (1=least important to 18=most important) from 1996

| VARIABLES | (1) | (2) | (3) | (4) |
|--------------------|---------------------|---------------------|---------------------|---------------------|
| | OLS | Fixed Effects | OLS | Fixed Effects |
| y1998 | 0.132 (0.280) | 0.495 (0.377) | 0.358 (0.324) | 0.610 (0.403) |
| y2007 | 0.405 (0.349) | 1.070** (0.541) | 0.391 (0.380) | 0.996* (0.573) |
| new_entrant | | | 0.802 (0.543) | 0.734 (1.074) |
| new_entrant*y1998 | | | -0.991 (0.669) | 0.668 (1.890) |
| new_entrant*y2007 | | | 0.374 (0.964) | 5.653*** (1.885) |
| Constant | 10.11*** (0.214) | 9.804*** (0.237) | 9.945*** (0.237) | 9.251*** (0.457) |
| Observations | 1,298 | 1,298 | 1,297 | 1,297 |
| R-squared | 0.001 | 0.012 | 0.004 | 0.033 |
| Number of idnumber | | 965 | | 964 |
| Worker FE | | YES | | YES |

Sources: Carris Company Employee Survey, 1996, 1998 and 2007 and Internal Personnel Data
 Note: Robust standard errors in parentheses. Standard errors are clustered at the individual worker level.

*** p<0.01, ** p<0.05, * p<0.1

Table 7 Changes in Commitment from 1998

Agree/disagree (1=strongly disagree to 5=strongly agree) on the statement “I am looking for another job which will pay more money”

| VARIABLES | (1) OLS | (2) Fixed Effects | (3) OLS | (4) Fixed Effects |
|--------------------|----------------------|----------------------|----------------------|----------------------|
| y2007 | -0.110 (0.0855) | 0.0309 (0.142) | -0.0517 (0.0986) | 0.0887 (0.148) |
| new_entrant | | | 0.200** (0.100) | -0.0921 (0.521) |
| new_entrant*y2007 | | | -0.0581 (0.220) | -0.827 (0.521) |
| Constant | 2.808*** (0.0492) | 2.765*** (0.0435) | 2.728*** (0.0638) | 2.817*** (0.185) |
| Observations | 940 | 940 | 938 | 938 |
| R-squared | 0.002 | 0.000 | 0.006 | 0.027 |
| Number of idnumber | | 840 | | 838 |
| Worker FE | | YES | | YES |

Sources: Carris Company Employee Survey, 1998 and 2007 and Internal Personnel Data

Note: Robust standard errors in parentheses. Standard errors are clustered at the individual worker level.

*** p<0.01, ** p<0.05, * p<0.1

Table 8 Changes in Match from 1998

Agree/disagree (1=strongly disagree to 5=strongly agree) on the statement “I think I fit in well here”

| VARIABLES | (1) OLS | (2) Fixed Effects | (3) OLS | (4) Fixed Effects |
|--------------------|----------------------|----------------------|----------------------|----------------------|
| y2007 | 0.0620 (0.0582) | -0.0198 (0.0864) | 0.0845 (0.0672) | -0.0846 (0.0977) |
| new_entrant | | | 0.0208 (0.0697) | 0.0168 (0.211) |
| new_entrant*y2007 | | | -0.102 (0.157) | 0.749*** (0.251) |
| Constant | 3.918*** (0.0339) | 3.943*** (0.0268) | 3.907*** (0.0435) | 3.921*** (0.0820) |
| Observations | 951 | 951 | 949 | 949 |
| R-squared | 0.001 | 0.000 | 0.002 | 0.054 |
| Number of idnumber | | 847 | | 845 |
| Worker FE | | YES | | YES |

Sources: Carris Company Employee Survey, 1998 and 2007 and Internal Personnel Data

Note: Robust standard errors in parentheses. Standard errors are clustered at the individual worker level.

*** p<0.01, ** p<0.05, * p<0.1

Figure 1 The Transition of Carris from a family-owned to a 100-percent employee owned firm

