EMPLOYERS RESPONSE TO FLEXTIME: AN ANALYSIS USING IN-DEPTH INTERVIEWS

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ABSTRACT

This paper discusses a preliminary study on perceptions of challenges and potential of flextime to congested urban areas. We present the information gathered through in-depth-interviews and subsequent questionnaires applied to general managers of cars dealers in Santiago, Chile, obtaining both qualitative and quantitative information. The quantitative information was used to investigate whether firms' productivity is affected by flextime, and to find some possible reasons that can allow firms to adopt flextime or change work arrival times. On the basis of the insights gained, the authors discuss the corresponding policy implications and chief conclusions of the research conducted.

Key words: Flextime; Data Envelopment Analysis, Travel Demand Management

1. INTRODUCTION

Most of the recent literature in Travel Demand Management shows a strong interest in policies that attempt to modify the behavior of travelers, e.g., congestion pricing or tradable credits. However, little research has been done in policies that seek to modify the behavior of demand generators. In peak periods, this is very critical as most of the trips are of compulsory nature (i.e., work trips or study trips). Yamamoto et al. (2000) and Yelds and Burris (2000) have shown that users who made recreation or shopping trips were more willing to change their departure time than for work-based trips. Work trips are usually more constrained in their arrivals than any other trips as external agents usually impose work schedules. Recent data corroborates the fact that work arrival times are tight and constrained. The Evaluation Study of the Port Authority of New York and New Jersey's Time of Day Pricing Initiative (Holguín-Veras et al., 2005) found that the decisions for travelling at certain time are usually constrained by their work schedules (about 50 percent of peak-hour users). The flexibility found was also very narrow: within 20 minutes. Roughly only 10 percent of trips reported a flexibility of 30 minutes or more. This has several implications to transportation policies. If work schedules are inflexible, workers will have little alternatives to respond to congestion, especially if transit is inefficient or not competitive with autos. Emmerink and van Beek (1997) and Moore et al. (1984) have even suggested that this lack of flexibility is the cause of the concentration of the peak-hour since all activities are scheduled to match the peak-hour. As they point out, flexibility would be a necessary condition for implementing demand management policies that seek to alter travel behavior patterns, i.e., congestion pricing.

Adding flexibility in work arrival times is one of the travel demand management policies that seek to modify the demand generator behavior. The feasibility and effectiveness of these

initiatives in reducing congestion has been largely proved in past studies (Ott et al., 1980; Safavian and McLean, 1974; TRB, 1980) together with the implications of allowing more flexibility in work arrival times. Holguín-Veras el al (2014), based on their work with the Port Authority of New York and New Jersey (PANYNJ) facilities data, suggest that inducing employers to increase the arrival time flexibility of employees could also help achieve a more balanced traffic pattern. Such importance has also been highlighted by Giuliano et al. (1983), Fergurson (2000), Hendricks and Georggi (2007), and Vonk Noordegraaf and Annema (2012).

However, the effective implementation of any alternative work schedule policy requires changes in management practices and sometimes in the organization of the company. Such changes should be aim to reduce the need to have all employees physically together the same hours all work days. In some cases, this is not possible, and when firms where imposed to alter their work schedules or add more flexibility in employers arrivals, they claimed that negative impacts in their productivity (inter- and intra-firm production effects) forcing them to withdraw such programs. This can explain why most of these programs are currently voluntary initiatives of private firms (Arnott et al., 2005). However, as noticed by (Arnott et al., 2005) to the current knowledge, there are no empirical studies that have studied how work starting times or flextime to infer affect inter- and intra-organizational productivity.

This paper discusses a preliminary study on perceptions of challenges and potential of flextime to congested urban areas. The objective of this paper is to investigate the effects of adopting flextime and overall attitudes of employers towards adopting flextime and off-peak work schedules. This is accomplished through identifying key effects from past experiments and validating it with a study that consists of in-depth interview to nineteen car dealers companies in Santiago, Chile. The survey was accomplished after months of contacting those firms and three rounds of an interviewing process. Data obtained from the interviews were aimed to measure firm's efficiency under flextime as a way to infer whether flextime affects inter- and intra-organizational productivity. The interviews were complemented with a set of scenarios designed to validate and identify key variables that can be used to influence in employers to adopt flextime.

This paper is organized as follows. Section 2 describes the sample and the responses obtained in the focus group. Section 3 seeks to measure whether there are productivity effects derived from flextime using a nonparametric technique, Data Envelopment Analysis (DEA), to investigate. Section 4, uses a Binary Logit model to gain more insights about two policies that can induce flextime, e.g. incentives and industry rescheduling of activities. Finally Section 5 presents a discussion, limitations and future plans for the study.

2. PILOT TEST DESCRIPTION AND INTERVIEWING PROCESS

2.1 Sampling and interview process

The selection of employers was based on location and size of a particular industry. We focus on car dealers at three different locations in two Santiago districts (Quilicura and Florida). These three locations concentrate 71 car dealers. In one of the locations in Quilicura, the car dealers were located within a large auto mall plaza (Movicenter), in the other two districts the

businesses are located in the streets within a radius of 5 miles or less.

Their activities cover selling both used and new automobiles as well as the operations related with the selling process (e.g. quotes). The industry was selected for two reasons. The first one is that the majority of their workers are almost are either white collars or sales persons. The two types of workers are those who usually have more flexible work arrival schedules. The second is that, in this sector, the goods have no substitutes from another industry sector. Moreover, it requires little coordination with other economic sectors. In that way, we can measure the inter-firm effects only through competition or collaboration within the same sector.

General Managers and human resources managers for the 71 car dealers were contacted and a total of 19 car dealers (around 27% of the total) agreed for interview. The interviews were taken place in March 2014. The companies interviewed vary from the number of employees and floor space (see Table 1). The questions were open and the objective of the interview was to investigate how the firms operate and how they are organized. Strong emphasis was put on understating employees work schedules arrangements, employees' arrival times, and clients' arrival times.

These managers were later contacted again in April 2014 to respond a small questionnaire designed to collect information that can be linked to the efficiency of the firm. In addition, a third and final round of interviews was arranged in May 2014 with the managers. In the interview, after explaining the concept of flextime and possible benefits, we present them set of scenarios to explore specific factors that can trigger flextime adoption or if they were willing to change their starting times. In both cases, the trigger variables tested were a monetary incentive and the case if the competitors and companies in the same industry sector change or alter their work schedules. In total each manager faced 9 scenarios for flextime, 9 scenarios for changing work schedules one hour earlier, and 9 scenarios for starting one hour late, completing 180 observations for each alternative presented.

2.2 Findings from the interviews

This section briefly presents the comments and descriptive statistics of the information received. The latter are summarized in Table 1. It can be observed that companies' size vary from companies with small number of operations to large operations. The information summarized also show three type of workers currently employed: Sales persons, Office and Administrative personnel (white collars), and "Other" personnel. The category "Other" was mainly composed by assistant and operations people that can be considered blue collars. They were in charge of operations activities, such as opening the facilities, cleaning of the cars, driving new cars from/to the storage. Companies usually start operations at 9 am. However, not all employees have to arrive at this time. Usually, sales people have different official starting times. Managers (58%) and owners (28%), mainly set work hours schedules while brand headquarters sets the rest 16%. None of the companies were implementing flexible work hours, in the sense of having their workers for certain core hours, relaxing both the arrival and departure times. By observing Table 1 and Table 2, it can be noticed that all companies had a minimum of 10 minutes tolerance in arrival times, although employees do not have flexibility at all in their departure times from work. Seventeen of the companies provided more than 10 minutes of tolerance, 8 companies had at least one employee with 30 minutes of tolerance in their arrival. However, only one was

providing 40 minutes of tolerance. It is important to notice that the average tolerance varies by type of employees and by the location of the business. However, it was consistent that sales personnel had larger tolerance, and white collars had little tolerance in their arrival times. Sales persons were also the larger group of workers, followed by white collars. This explains why this particular category of workers has earlier work schedules. When managers were asked which schedules couldn't be shifted under any circumstance, they all agree that the blue collars could not be shifted or at least they should arrive before any other group as this category of worker usually prepares the facilities for opening every day.

Table 1: Summary of the relevant data collected

	Movicenter at Quilicura				Florida				Quilicura			
	Average	Min	Max	Mode	Average	Min	Max	Mode	Average	Min	Max	Mode
Monthly Sales [m.clp]	688.89	100.00	1,000.00		440.00	150.00	700.00		533.33	60.00	1100.00	
Monthly Operations	66.11	20.00	100.00		64.00	35.00	105.00		60.33	12.00	95.00	
Employees (Sales)	8.56	3.00	14.00		5.60	3.00	10.00		7.00	2.00	15.00	
Employees Office (white collars)	6.33	2.00	11.00		4.00	3.00	6.00		185.50	1.00	1100.00	
Employees (Other)	3.00	1.00	5.00		2.40	2.00	4.00		17.17	0.00	95.00	
hh per week (Sales)	46.33	44.00	50.00		45.40	45.00	47.00		47.17	44.00	55.00	
hh per week (Office)	47.33	44.00	50.00		45.40	45.00	47.00		47.17	44.00	55.00	
hh per week (Other)	50.89	44.00	60.00		45.40	45.00	47.00		45.60	44.00	47.00	
hh per day (Sales)	8.61	8.00	10.00		9.00	9.00	9.00		8.92	8.00	9.50	
hh per day(Office)	9.11	8.00	10.00		9.00	9.00	9.00		8.92	8.00	9.50	
hh per day (Other)	9.67	8.00	11.00		9.00	9.00	9.00		8.92	8.00	9.50	
Official Starting times (Sales)		9:00 AM	9:00 AM	9:00 AM		9:00 AM	10:30 AM	10:30 AM		9:00 AM	10:30 AM	10:30 AM
Official Starting times (Office)		9:00 AM	10:00 AM	9:00 AM		9:00 AM	10:30 AM	10:30 AM		9:00 AM	10:30 AM	9:00 AM
Official Starting times (Other)		9:00 AM	9:00 AM	9:00 AM		9:00 AM	10:30 AM	10:30 AM		9:00 AM	10:30 AM	9:00 AM
Tolerance (Sales) [min]	19.44	15.00	25.00		29.00	10.00	90.00		30.00	15.00	40.00	
Tolerance (Office) [min]	17.22	10.00	20.00		14.00	10.00	20.00		7.50	5.00	15.00	
Tolerance (Other) [min]	8.89	5.00	15.00		9.00	5.00	15.00		24.00	15.00	40.00	
Total Floor Area [m^2]	433.33	250.00	500.00		196.00	120.00	400.00		288.33	180.00	500.00	
Total Office Area [m^2]	71.11	50.00	100.00		48.00	30.00	70.00		80.00	60.00	140.00	
	Companies (total) = 9				Companies (total) = 5				Companies (total) = 5			

m.clp = Million of Chilean Pesos

Table 2: Experience with flextime and other alternative starting times

	Answer	
	Yes	No
- Currently performing full flextime programs	0	19
- Having considered full flextime programs	3	16
- Could perform full flextime programs	11	8
- Having considered open business operations earlier	0	19
- Having considered open business operations later	7	12
- Currently having tolerance on arrival more than 10 minutes	17	2

Table 2 shows the answers to questions regarding alternative work schedules. As mentioned, no companies have full flextime programs implemented; they only provide tolerance in their arrival times. None of the companies have thought about implementing flextime programs. More important, none of them were completely aware of the benefits that flextime can have in morale and quality of living of their employees, i.e. avoid congestion. When these benefits were explained, about 58% said they could implement flextime programs, referring basically to increase the flexibility on the arrival times in 30 minutes or more. However, they all agreed that this can be applicable to sales and administrative personnel (white collars). Thus it is possible that, if some of the impeding reasons for not having implemented flextime programs are relaxed they can embrace in this concept. It also is interesting that none of the companies have thought about starting their operations earlier, while about 37% have considered starting operations later, i.e., one hour later. These can be related to the actual clients' arrival profiles. It was observed that in general there are about 2 hours of difference between the time the companies open (with the arrival of the employees) and the start of the arrival of clients. Moreover, the peak periods of client arrivals are even further, between noon and 2 pm, and between 4 pm and 6 pm. Besides this, the busiest periods of the day when workers where usually busy in terms of their operations (quotes, sales, etc.) are between 10 am and 2pm and between 3 pm and 6 pm.

Among the reasons for not providing more flexibility, the managers were asked to list all the reasons that would impede or have impeded to provide more flexible (30 minutes or more) arrival times in their employees. Table 3 lists groups the reasons provided by the managers. All firms agreed that one the main reasons were either facility's restrictions, i.e., Mall Plaza obligates them to open at 9 am in the case of Movicenter at Vitacura or they need to workers to arrive at 9 am to check if facilities are ready for opening. Other chief reasons were the costs of monitoring employees (100%) and a possible reduction on sales (78.9%). It is worth to mention that these two reasons are inter-related as the managers were afraid to lose control with their workers. Security costs was another important factor (47.4%), as they believe they would have to extend the hours of security guards. Lack of control in employee's arrival times ranked as the less important factor.

Managers were also asked whether they would be able to change their opening times, i.e., either opening one hour earlier or one hour late. In this case, again Mall Plaza and facilities restrictions were referred as the most impeding factor. In this question, 94.74% of the managers also cited that if their competitors were either open earlier or later, they would not be interested in opening later or earlier respectively. Possible reduction on sales was also another key factor (78.5%). And the increase in costs, either general costs such as monitoring works (arrival and departure times) and security costs (especially when opening an hour late) were also cited by the managers. Employee acceptance of new starting times and customers concerns had similar percentages (36.8% and 31.6% respectively).

Table 3: Reasons obtained from managers

Reasons for not performing full flextime programs	Movicenter at Quilicura	Florida	Quilicura
- Mall Plaza or facilities restrictions	9	5	N/A
- Costs of monitoring employees	9	5	5
- Reduce sales	5	5	5
- Security costs	3	2	4
- Lack of control of employees arrival	2	0	0
- Other	2	3	2

Reasons for not changing starting times	Movicenter at Quilicura	Florida	Quilicura
- Mall Plaza or facilities restrictions	9	5	N/A
- Other businesses not open/open (e.g., competitors)	8	5	5
- Reduce sales	5	5	5
- Increase costs	5	5	5
- Security costs	5	5	2
- Employee acceptance	4	3	3
- Customers do not accepting	2	1	3
- None of the above	2	1	0

3. MEASURING EFFICIENCY

Data Envelopment Analysis (DEA) (Charnes et al, 1978) is a well-known non parametric technique used to measure the efficiency of decision making units (DMU). In this case, we treat each company as a DMU to test whether companies with certain employees with flexibility of 30 minutes or more are efficient in terms of sales and/or operations

3.1 Data Envelopment Analysis (DEA)

Productivity is usually defined as the ratio of output(s) to input(s). This definition is easily and very obviously capable of explaining any situation where there is a single output and single input. However, it is more common that production has multiple outputs and inputs, in which case productivity refers to Total Factor Productivity; a productivity measure involving all factors of production (Coelli et al., 1998). On the other hand, efficiency is defined as relative productivity over time or space, or both. The process involves creating a single 'virtual' output to a single 'virtual' input without pre-defining a production function. This is the underlying concept of the DEA to measure the efficiency (technical efficiency in DEA terminology) of the firms used in this study.

The measurement of technical efficiency oriented to inputs identifies the quantity to which the inputs must be reduced, for keeping the specified level of the outputs. Correspondingly, DEA can also find the increase in the level of outputs, using the same level of inputs. The original DEA is a fractional nonlinear programming, model. Chanes and Cooper (1962) shown that a fractional problem can linearized. Using this approach, CCR model (Charnes et al., 1978)

oriented to inputs and variable return to scale, for the case of *s* firms, producing *n* outputs, using *m* inputs is described by the following problem:

$$Max \quad \theta_r \tag{1}$$

Subject to

$$v_1 x_{11} + v_2 x_{21} + \cdots + v_s x_{sn} \le \theta_s x_{kr} \qquad (k = 1, \cdots, m) \tag{2}$$

$$v_1 y_{11} + v_2 y_{21} + \cdots + v_s y_{sm} \ge y_{jr} \qquad (j = 1, \cdots, n) \tag{3}$$

$$v_1, v_2, \cdots, v_s \ge 0 \tag{4}$$

In our case, the variable θ_r is the technical efficiency measurement of firm r =1,…, s; y_{jr} is the matrix of outputs j = 1,...,n considered for firm r, and x_{kr} refers to the values of inputs k = 1,…, m for firm r. Thus, it is clear that this model has to be solved for each firm r, obtaining r technical efficiency scores (one for each firm). The value of the technical efficiency will vary from 0 to 1, with an efficient firm reaching a technical efficiency measure θ =1.

3.2 Results

Two models were estimated solving the problem (1)-(4), using the linear programming solver CPLEX under GAMS, for each firm interviewed using different measures of inputs and outputs. For the first model, sales were considered as the single output, while the number of employees with rigid work schedules (less than 30 minutes) and the number of employees with flexible work schedules (30 or more minutes) were considered as the inputs. The second model, uses two outputs: sales and number of operations, and it use the total number of hours worked per week, and total floor area in addition to the workers inputs.

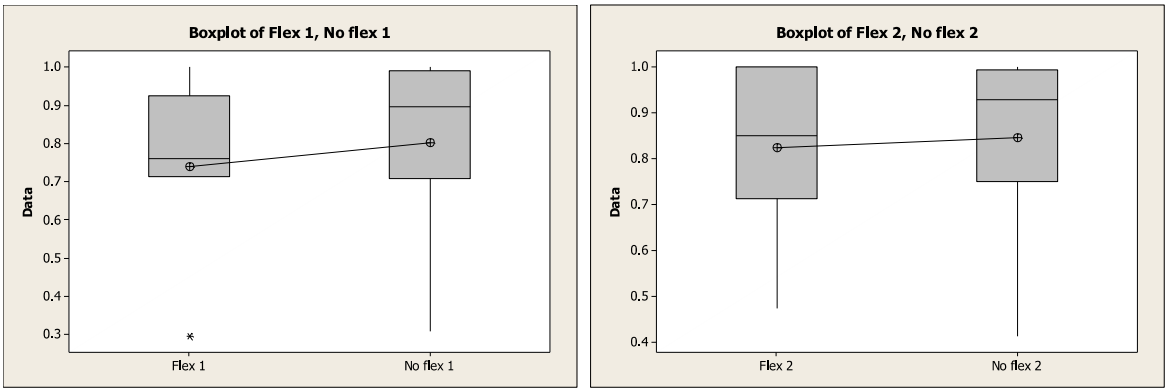
The data together with the efficiency scores obtained by each model are shown for each company in Table 4. For the first model, it can be notice that only three firms are in the efficient frontier meaning with θ =1. Only one of them had workers with flexibility of 30 minutes or more. The average efficiency for the firms with more flexibility was 0.741 while the average efficiency for the firms with more rigid schedules was 0.803. A simple t-paired test has shown that this difference is not significant (p-value = 0.575, Figure 1). Using the second model, one more firm had an efficiency score of 1. Moreover, now both kinds of firms had more similar average efficiency scores: 0.824 for those with flextime and 0.846 for those with rigid schedules. Again, the t-paired test showed that this difference is not significant (p-value = 0.816).

Table 4: Efficiency scores obtained using DEA

Company No.	Employee w/fixed work schedules	Employee w/flexibility of 30 or more min	hh per week	Floor area [m^2]	Operations (units)	Monthly Sales [m.clp]	Efficiency Score 1*	Efficiency Score 2**
1	14	0	616	500	75	750	0.995	**1.000**
2	25	0	1250	450	90	1000	0.743	0.743
3	19	0	950	500	100	1000	0.977	0.977
4	7	0	320	250	30	350	0.929	0.929
5	7	0	308	500	35	300	0.796	0.805
6	9	12	978	450	100	1000	0.726	0.732
7	18	0	876	500	80	900	0.929	0.929
8	7	10	820	500	65	800	0.714	0.714
9	6	0	301	250	20	100	0.310	0.413
10	7	0	315	400	35	150	0.398	0.619
11	13	0	585	130	105	700	**1.000**	**1.000**
12	13	0	585	120	80	700	**1.000**	**1.000**
13	8	0	360	150	50	300	0.696	0.774
14	3	4	329	180	50	350	0.763	0.850
15	1	10	495	400	60	380	0.760	**1.000**
16	**1**	**6**	**315**	**200**	**60**	**500**	**1.000**	**1.000**
17	1	2	165	180	12	60	0.296	0.473
18	**3**	**5**	**376**	**250**	**65**	**460**	**0.863**	**0.963**
19	3	8	517	200	70	700	0.925	1.000

*Output = Sales, Inputs = Workers with flexbility, workers without flexibility

**Output = Sales and operations, Inputs= Workers with flexbility, workers without flexibility, total hours worked per week, floor area



(a) Comparison of efficiencies – Model 1 (p-value = 0.575)

(b) Comparison of efficiencies – Model 2 (p-value = 0.816)

Figure 1: Boxplot for comparing efficiencies and p-values of t-test

4. FLEXTIME ADOPTION

In the third and final round of our data collection process, nine scenarios were presented to each manager. They were a combination of two variables that were identified earlier as possible triggers for flextime adoption. The first one was a monetary incentive. Due to the type of industry, several amounts were tested before reaching two values: 2 million of Chilean pesos

(about U$ 4,000) and 5 million of Chilean pesos (about U$ 10,000) per month. Together with the no incentive alternative, this completes three incentive scenarios. The other variable was a shift in starting times for the local business in their location, specifically, a change in starting times of their competitors. Again three scenarios were tested: no change in starting time, other businesses start one hour earlier, and other businesses start one hour later. A full factorial experiment was conducted, in which we ask the managers, whether they could be able to increase or provide flexibility over 30 minutes for all sales and white collars employees. All managers responded the full combination of alternatives (3x3) in a random order.

A binary logit model (Ben Akiva, 1985) was developed including also some variables from Table 1 such as total sales, number of employees, average number of hours worked per week, average tolerance, and total floor area. The resulting model obtained using Stata 11.1 is shown in Table 5. The overall goodness of fit of the model provided by the Log likelihood ratio is -43.6228 and the Likelihood ratio Chi-square is -91.65 (p-value = 0.000).

It this interesting to notice that the size of the company, usually related to the total sales, and number of employees are not significant. Works starting time in other companies are significant while the financial incentive is significant to some extent but mainly for the largest incentive. However, it seems that while both amounts of financial incentives can have a positive impact in flextime, only starting late has an impact in flextime. Starting one hour early has a negative impact in the flextime choice.

Table 6 shows that the elasticity of the trigger variables. Clearly starting one hour earlier has a strong impact in not adopting flextime. However, starting one hour late has a positive impact in choosing flextime; moreover the value of the elasticity is in between the elasticity of both incentive amounts. This means that if incentives cannot be provided (i.e., they end up being too high as in our case), convincing the whole industry to start one hour late can lead to similar results. The results in Table 6 also show the predicted probability for choosing flextime with the current sample. It shows that about 55% will choose flextime if the local competitors also start one hour late. This percentage is larger than providing 5 million Chilean pesos per month.

Table 5: Binary model for flextime over no flextime

Dependent Variable: Flextime (30 mintues or more) or not Flextime

Explanatory variables	**Coefficient**	**z-statistic**	**P-value**	
Constant	-16.2077	-3.06	0.002	**
Sales	-0.0042334	-1.53	0.127	
Number of employees	0.1268059	0.73	0.464	
Average working hours	0.1830575	1.69	0.091	*
Average tolerance	0.1659575	3.76	0.000	**
Total Area	0.0091033	2.59	0.010	**
Industry work starting time				
- 1 hour early	-2.7421928	-2.78	0.005	**
- 1 hour late	1.379549	2.3	0.022	**
Financial Incentive				
- 2 m.clp per month	0.586753	0.91	0.362	
- 5 m.clp per month	1.627244	2.31	0.021	**

*Significant at 90%
** Significant at 95%
Log likelihood = -43-622854
Likelihood ratio Chi-square = -91.65 (p-value = 0.000)
Number of observation = 136
Pseudo R^2 = 0.5123

Table 6: Semi-elasticities for trigger variables and predicted probabilities with current sample

		Elasticities	z-statistic	p-value	Probability (Flex = 1)	z-statistic	p-value
Industry / Competitors starting time	**Current starting time**				0.367949	7.31	0.000
	1 hour early	-2.065147	-2.67	0.008	0.156933	4.68	0.000
	1 hour late	0.7511188	2.24	0.025	0.5483946	10.18	0.000
Financial Incentive	**No financial incentive**				0.2888433	7.03	0.000
	2 m.clp per month	0.3962479	0.91	0.362	0.3582884	7.35	0.000
	5 m.clp per month	1.003516	2.33	0.020	0.4717827	8.71	0.000

5. Conclusion

This paper preliminary investigated the attitudes of Chilean employees from a small economic sector towards adding more flexibility in employee's work arrival times. It was found that the companies have employees with arrival flexibility of a minimum of 10 minutes and very little have flexibility over 30 minutes. White collars and sales employees have larger flexibility than blue collars. This is consistent with the literature in other countries. A good portion of the companies has positive perception about the possibility of adding more flexibility if some of their concerns were related to loss in efficiency and an increase in costs. However, the results obtained from this sample shows that, for this particular industry, flextime workers do not have a significant impact in firms' productivity. Additionally, financial incentives and work starting times of the competitors have a significant impact in the provision of flextime. We also found that if arrangements with the whole industry to change work-starting times are made, the effect of this change can even be comparable with providing financial incentives. This opens other policy alternatives rather than financial incentives. For instance, one alternative to encourage flextime is to involve employers in a particular industry (or at least in a particular area) to take up this kind of initiative. Credits or certificate recognition programs can be used in these cases. However, this requires working not only managers but also, headquarters, and administrators of Mall Plazas in voluntary programs.

In spite of the limitation derived from the small sample, we believe that the methodology can be applicable to other industries and it is suitable to find whether firms with flextime employees are efficient. In addition, this research highlights the importance of fully understanding employer's attitudes as they play the main role in accepting this kind of initiatives.

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REFERENCES

Arnott, R., Rave, T., and R. Schöb.(2005) **Staggered work hours for dominant employers. In Alleviating Urban Traffic Congestion,** pages 135-185. MIT Press, Cambridge, MA.

Ben-Akiva, M. E., and S.R: Lerman (1985). **Discrete choice analysis: theory and application to predict travel demand**. The MIT Press, Boston, Chapter 4, 59-99.

Charnes A, and W.W. Cooper (1962). Programming with linear fractional functionals. **Naval Research Logistics Quarterly**, 9, 181–5.

Charnes, A. Cooper, W. W., and E. Rhodes (1978) Measuring the Efficiency of Decision Making Units. **European Journal of Operational Research**, 2, 429-444.

Coelli, T., Prasada Rao, D. S. and Battese, G. E. (1998). **An Introduction to Efficiency and Productivity Analysis**. Kluwer Academic Publishers: Boston, Dordrecht and London.

Emmerink, R.H.M. and P. van Beek. (1997) Empirical analysis of work schedule flexibility: Implications for road pricing and driver information systems. **Urban Studies**, 34(2), 217–234.

Ferguson, E. (2000). **Travel Demand Management and Public Policy**, Ashgate, Aldershot, UK.

Giuliano, G., Hwang, K., and Wachs, M. (1993). Employee trip reduction in Southern California: First year results. **Transportation Research Part A: Policy and Practice**, 27(2), 125-137.

Hendricks, S. J. and Georggi, N. L. (2007). Documented Impact of Transportation Demand Management Programs Through the Case Study Method. **Journal of Public Transportation**, 10(4), 79-98.

Holguín-Veras, J., Ozbay, K. and A. de Cerreño. (2005) E**valuation Study of Port Authority of the York and New Jersey's Time of Day Pricing Initiative**. Technical Report FHWA/NJ-2005-005, Federal Highway Administration/U.S. Department of Transportation, Washington, DC.

Holguín-Veras, J., Sánchez, I., and B. Reim, B. (2014) ETC Adoption, Time-of-Travel Choice, and Comprehensive Policies to Enhance Time-of-Day Pricing: A Stated Preference Investigation. Submitted.

Moore, A.J., Jovanis, P.P., and F.S. Koppelman, (1984) Modeling the choice of work schedule with flexible work hours. **Transportation Science**, 18(2), 141-164.

Ott, M., Slavin, H. and D. Ward. (1980) Behavioral impacts of flexible working hours. **Transportation Research Record,** 767, 1-6.

Safavian, R. and K.G. McLean. (1975) Variable work hours: Who benefits? **Traffic Engineering**, 45(3), 17–25.

T.R.B. (1980) **Alternative work schedules: Impacts on transportation**. Technical Report NCHRP Synthesis of Highway Practice 73, Transportation Research Board, Washington, DC.

Vonk Noordegraaf, D.M. and J.A. Annema (2012) Employer Attitudes towards Peak Hour Avoidance. **European Journal of Transport and Infrastructure**, 12(4), 373-390

Yamamoto, T., S. Fujii, R. Kitamura and H. Yoshida (2000). Analysis of Time Allocation, Departure Time, and Route Choice Behavior Under Congestion Pricing. **Transport Research Record**, 1725, 95-101.

Yelds, A. and M. Burris (2000). Variable Toll Pricing Program, Lee County, Florida: Revealed Preference Telephone Survey Findings. **Transport Research Record**, 1732, 42-49