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A Quasi-Experimental Test of Large Retail Store Impacts on Regional Labor Markets: The Case of Cabela's Retail Outlets

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Abstract. This study applies a quasi-experimental method for performing economic impact analysis of a firm's entrance on regional labor markets. The impact studied is the entrance of a Cabela's retail outlet in seven U.S. counties from 1998 through 2003. Using a time-space dynamic model in a monthly panel data setting, this paper evaluates the impact of new firm entrance on employment, unemployment rates and labor forces in 7 control and 7 treatment counties. I include an endogeneity test, rejecting growth and labor market endogeneity in the entrance of Cabela's. The findings suggest that the entrance of a large-scale specialty retail store has no persistent impact on employment in the effected or surrounding counties. These findings suggest labor market constraints. More simply retail wages are not sufficient to increase labor market participation or alter economic migration patterns in the affected counties. This paper recommends that benefit cost analysis be performed when public resources are dedicated to infrastructure or tax incentive efforts.

1. Introduction

The impact of new firm location on regional economic performance is an issue of considerable concern to local decision makers and concerned residents. This interest arises from a number of factors beyond simple curiosity since local governments and taxpayers often must bear some related infrastructure costs. Any debate regarding the deployment of public resources often focuses on how the firm will influence the region. Researchers often inform these debates through the application of analysis designed to estimate impacts ranging from water and air quality to housing and labor markets. Answers to these questions naturally become more urgent the larger the putative impacts of the proposed facility or when considerable public funds are offered as part of an incentive package to the firm. Under this latter scenario, research as part of a broader cost-benefit analysis of the public expenditure may provide evidence as to the efficacy of the investment. This study provides a tractable method for informing these types of analysis.

This analysis focuses on the retail "big box" sporting goods store Cabela's both because of increasing

interest in retail as a source of local economic development and also because of much recent media attention on tax incentives offered to the firm. I proceed with a brief background of the modeling and policy debate regarding regional incentives, with some emphasis on the retail sector. Next, a quasi-experimental model that improves upon most current modeling efforts is provided, followed a description of results and finally policy recommendations and conclusions.

There has been considerable interest in retail firms among economic development officials in many regions. This interest has focused research attention on several factors including the role amenities play in regional labor markets, and the importance of retail in maintaining flexible labor markets, to name a few (Gibson, Albrecht and Evans, 2003; Blakely and Bradshaw, 2002).

The choice of the Cabela's store was largely motivated by its rapid retail expansion in several states over the past six years, and serves as a representative expanding "big box" retailer. Also, considerable economic development efforts have been expended in states to lure this firm to the area. For example Michigan provided in excess of \$38 million to a Cabela's

facility, Kansas established a Sales tax and Revenue Bonds legislature to pay for infrastructure at a new Cabela's site.¹ Most recently West Virginia provided in excess of \$75 million for a new store near Wheeling.² The firm sells a very wide range of sporting and outdoor goods through mail order and retail. The firm itself warrants considerably more space than this study will permit. The company is just over 40 years old and had a single location until the mid 1980's. It has since expanded into nine locations, with seven opening since 1998. Two earlier facilities replaced an existing sporting and outdoor goods store, and so have not been analyzed. The company has a remarkable following among outdoor enthusiasts and provides a range of products from custom-made rifles to large military contracts.³ This company is enjoying a remarkable period of growth, which makes analysis of its regional impact timely. The list of stores under examination in this study is outlined in Table 1.

Table 1 Stores in Sample

Store Location	Opened
Sidney, NE	7/24/91
Kearney, NE	1986
Owatonna, MN	4/1/1998
Prairie du Chien, WI	9/29/1998
East Grand Forks, MN	9/29/1999
Mitchell, SD	3/31/2000
Dundee, MI	8/30/2000
Kansas City, KS	8/15/ 2002
Hamburg, PA	9/18/2003

The debate regarding the effectiveness of regional tax incentives and economic development competition is primarily confined to the policy arena, with research questions having mostly been resolved. Gabe and Kraybill (2002) test incentives on firm growth in over 350 recipient businesses in Ohio, finding no association between incentives and employment growth. Fisher and Peters' (2001) review of the literature on tax incentives report little evidence that the incentives

¹ This effort is garnering new criticism since a competitor of Cabela's is now receiving similar aid (Collison, 2003)

² The West Virginia payments included direct economic development aid and infrastructure expenditures, not other tax incentive benefits.

³ The author notes a particularly happy experience with Cabela's. While an infantry captain in Desert Shield I received a three-day turn around on a desperately needed sweater delivered to a very inaccessible location.

lead to employment growth. More recently LaFaivre and Hicks (2005) estimate the impact of Michigan's state tax incentive program for manufacturing and warehousing establishments from 1995-2003. They find that the considerable state tax incentives associated with the MEGA program yielded no discernable impacts on the targeted industries. These authors did find that the tax incentives increased construction employment in the affected counties, but the cost of each new construction job was roughly \$130,000 over an 18 month period. These studies leave little doubt regarding the efficacy of state and local tax incentives designed to increase employment and wages in targeted industries.

2. Modeling Local Impacts of Firm Location

The strong interest in the impact of new firms occasionally manifests itself in research questions posed to economists and other public policy researchers at the state and local level. The most common method of analyzing impacts is through the application of a regional input-output model (e.g. IMPLAN or RIMS II). While experienced researchers may be able to execute very sophisticated analysis with these models, the inter-regional trade linkages demonstrate some key weaknesses. The models are linear simulation models that perform poorly when faced with impacts beyond the range for which the models have been calibrated. These are well known concerns with the input-output models, which render them inapplicable in only a minority of cases.⁴

An alternative method of estimating impacts that incorporates the regional focus within a dynamic framework is the quasi-experimental method (Isserman and Merrifield, 1982, 1985; Reed and Rogers, 1999; Hicks, 2004). These methods are designed to avoid endogeneity in policy affects as well as provide a cost appropriate method of analysis.

The quasi-experimental methods typically apply control groups and treatment groups for specific events where broader regional analysis is inappropriate. This is similar to clinical trial. All of these authors used the same systematic approach to selecting the control groups. In each case the control group is selected through some measure of proximity from the treatment group. The treatment group is that region that has been exposed to a policy or event. Perhaps the most common application of the quasi-experimental method is the selection of a control

⁴ Many authors have found these models useful in describing a subset of impacts as part of a multi-stage modeling effort (Burton, Hicks and Kent 2000).

group by selecting a single measure (often the dependent variable in a regression analysis) and selecting the most proximal regions nationwide. This is facilitated by the Census Tiger software, which permits county and Metropolitan Statistical Areas comparisons by this method.

In our case I have identified six regions that have been 'treated' with the opening of a particular retail outlet since 1995. The control group was the most similar county within each state as measured by the population in 2000. Thus a presence dummy for the 'treatment effect' is a standard application.

One potential criticism of any model of this is the level of aggregation presented in a county level study. While most studies of these phenomenon are performed at the county level, some (notably Stone, 1988), are performed at lower levels of aggregation. I choose the county level of estimation, trading off geographic specificity with frequency of observation.

The specification of our model is motivated by the desire to capture the employment dynamics associated with new firm entrance. Using monthly data, I attempt to capture the contemporaneous impact of Cabela's entrance on labor markets as well as a total of a one quarter lagged impacts. The inclusion of the spatial autocorrelation component (with a similarly posited lag structure) and seasonal dummies make this an empirical rather than clearly structural model of impacts. This approach has been frequently employed by researchers analyzing impacts of single firms (Basker, 2005; Nauemark, Zhang and Ciccarella, 2005). This approach motivates careful review of the restrictions on model, which I review in a later section. Estimating the impacts of this type of facility through the quasi-experimental method is typically approached through the application of a time series cross sectional model. The selection of an appropriate model is subject to ongoing debate within the literature (Baltagi, 1995; Anselin, 2001).

A concern in this model is the choice of a fixed effects or common intercept.⁵ I test both options. The basic model I posit has elsewhere been referred to this as a time-space dynamic model in that the specification incorporates the spatial and time autocorrelation features (Hicks and Wilburn, 2001; Anselin, 2001). This specification, estimated through pooled OLS takes the form:

$$y_{i,t} = x\beta + \rho \sum_{n=1}^z y_{i,t-n} + \theta \sum_{z=1}^z y_{i,t-z} + \delta y_{i,t-n} + e_{i,t} \quad (1)$$

⁵ Random effects, pooled vector autoregressive and seemingly unrelated regressions were not employed for technical reasons limiting their suitability.

where $x\beta$ is an $n \times m$ matrix of explanatory variables, ρ is an $m \times 1$ spatial autoregressive vector, θ is an $m \times z$ space-recursive matrix, and δ is the usual autoregressive coefficient. The W matrix is an $n \times n$ first order contiguity matrix with normalized row components and e is the error component considered to be $iid \times N(0, \sigma^2)$. The seemingly unrelated regression estimator is employed to account for contemporaneously correlated errors.

In practice then the spatial component will be the mean value of the dependent variable in the contiguous counties in the current time period (t). The space recursive value is the spatial autocorrelation in z lags. The independent variables in our case include a suite of monthly dummies, and the Cabela's presence dummy for each of the treatment counties. A trend value is also included. The dependent variable for the first specification is aggregate employment in the county.

In addition to the basic approach of the empirical model, I am also concerned with the potential for endogeneity in the entrance decision. Most particularly, is Cabela's choosing to locate within regions where growth is already occurring, thus resulting in $E(e) > 0$, which obviously results in a biased estimate of the employment impacts. The inclusion of a trend variable (which is part of the empirical specification) is one approach to this problem, but a preferred method is to include the potential for endogeneity within the estimation itself.

In order to account for endogeneity I include an instrumental variable estimation which follows an identification strategy that accounts for both the potential for pre-existing growth and labor market slack in the effected counties. Thus, I create an identifying equation such that:

$$y_{i,t} = \alpha \frac{\text{Unemployed}}{\text{Labor Force}} + (x_{t-1}\beta + \rho [\tilde{W}y_{i,t-n-1}] + \theta [\tilde{W}y_{i,t-z-1}]) + \delta y_{i,t-n-1} + e_{i,t} \quad (2)$$

Where the unemployment rate serves to identify the basic model (equation 1), which includes lagged autoregressive and dependent variables. This strategy incorporates both potential endogeneity concerns, and will be estimated through traditional two stage least squares.

3. Data and Estimation

Happily, the company also provides remarkable detail about itself on the Internet. I was able to determine the month in which each store opened, in each of

the five counties we examined.⁶ This, along with monthly employment and labor force provide the key data for our analysis. We estimate our model on monthly data from January 1990 through June 2003. With twelve cross sections this provided a large sample size ($n=1884$) and descriptive data are provided in Table 2.

Our estimation offers the OLS with common and fixed effects, and the 2SLS test with the identifying equation 2, above. Results are presented in Table 3.

Absent clear specification guidance it appears prudent to treat each of the options and compare model performance. The five regressions displayed in Table 1 represent a cross section of specifications. The first feature of note is the remarkable parameter stability. This was expected in the spatial and time autoregressive components, trend and monthly dummies. There was also remarkable stability in the Cabela's initial impact with some divergence in lagged impacts. None but the Cabela's estimates warrant additional discussion (think about rewording this sentence).

As mentioned earlier the employment impact of Cabela's reported by the most recently opened and announced stores range from 500 to 1,000 workers. It is difficult to determine if these values include both direct and indirect employment, or simply gross direct employment by the firm. I have been unable to uncover research identifying these values from the state development offices making these claims. Most clearly however, these results suggest that no net employment impacts occur in the counties in which Cabela's opens. This result only persists in the short run, with the longer run effects (within a quarter) drop to zero. These results are supported in a cointegration test of employment levels and the presence dummy of the Cabela's (Engle and Granger, 1987). Endogeneity does not appear to bias the results, at least insofar as Cabela's fails to elicit statistical significance at any level.

Some of the robustness tests are illustrated above (exclusion of the spatial autoregressive component), but more is warranted. The selection of a quarter lagged employment estimate was designed to encompass the period from opening, through the period where the store would be fully populated with employees. A series of Wald tests on these restrictions suggests that the model would not suffer bias if the inclusion of these (or lags up to 12 months) are excluded in this model. I report them to provide more information about the absence of a Cabela's impact on local labor markets.

These results are remarkably robust, with models that exhibit a high degree of explanatory power and strong parameter stability. Why the entrance of a large retail facility, however, does not result in net employment growth calls for discussion.

4. Discussion

The findings reported above that Cabela's entrance result in no net employment may be attributable to several factors. I begin with the least likely of these. First, there is considerable regional variation in impacts, which may simply be netting to zero in this model or the result of misspecification. Though possible, this seems highly unlikely if not impossible, given that in excess of 99 percent of employment is explained in this model, which also enjoys robust parameter estimates across several specifications.

Second, though I have looked at a long time period, the impact of Cabela's may take several years to materialize, making these results a premature conclusion. Notably, the oldest Cabela's in this estimation is only a bit older than five years, with the newest less than a year old (from our most recent data). If impacts require more than a few years to manifest themselves they may yet happen. If this is the case, impacts are remarkably slow to materialize.

The third, and most probable reason for the lack of employment impact, is the inelasticity of labor supply. Simply stated, the wage generated by Cabela's is insufficient to generate increases in labor force participation or economic migration that will be necessary to generate net employment impacts. Simply, few workers are moving to, or remaining in the affected counties because of the incomes offered by Cabela's. This hypothesis is strongly supported by the high positive correlation between the fixed effects error component and the unemployment rates at the month of Cabela's entrance. This suggests that in counties with relatively high unemployment rates there exists the possibility of a positive net job impact.⁷

Earlier studies have reported modest net employment gains when a large retail facility locates in a county in West Virginia (Hicks and Wilburn, 2001; Basker, 2003). These studies attribute their findings to productivity gains within the industry evaluated that could be attributed to the firm evaluated (Wal-Mart). Notably, however, the mix of goods provided by Wal-Mart and Cabela's differs. Wal-Mart provides local retail goods, while Cabela's provided goods that are

⁶ Most of these data were available on-line or from press releases or news articles, with dates also provided by the company.

⁷ Though it has not been tested, this may also occur in regions with low labor force participation rates as well. The impacts will be potentially permanent for structural unemployment, but should be transitory for cyclical unemployment.

Table 2. Selected Summary Statistics

	Cabela's Exposure	Employment	Spatial Employment	Unemployment Rate	Labor Force
Mean	0.58	35,166.0	63,903.8	6.08%	38,024
Median	1.00	16,841.0	16,709.1	5.06%	17,694
Standard Deviation	0.51	33,053.8	92,825.8	2.90%	36,181
Minimum	0.00	6,128.0	2,070.4	2.04%	6,700
Maximum	1.00	92,873.0	297,128.7	11.48%	96,990

Table 3. Estimation Results (t-statistics in parenthesis)

Variable	Common	Fixed-effects			2SLS
	-85,970.41				
C	(-0.44)	
	44.70	47.55	78.49	47.15	1,162.00
Cabela's	(-1.31)	(-1.41)	(-2.01)	(-1.24)	(0.60)
	-37.59	-39.15	-43.16	-17.32	6.42
Cabela's (t-1)	(-1.10)	(-1.15)	(-1.10)	(-0.46)	0.07
	-10.04	-13.25	-28.58	-5.32	-297.53
Cabela's (t-2)	(-0.29)	(-0.39)	(-0.73)	(-0.14)	(-0.53)
	-35.68	-34.01	-20.64	-56.70	91.25
Cabela's (t-3)	(-1.05)	(-1.01)	(-0.53)	(-1.51)	(1.14)
	0.07	0.06		0.07	0.03
ρ	(-35.92)	(-34.70)	...	(-40.47)	(0.36)
	0.00	0.00		0.00	-0.04
θ (t-1)	(-0.35)	(-0.08)	...	(-0.52)	(-2.54)
	0.00	0.00		0.00	0.03
θ (t-2)	(-0.33)	(-0.41)	...	(-0.29)	(1.26)
	0.00	0.00		0.00	0.01
θ (t-3)	(-1.24)	(-0.12)	...	(-0.18)	(0.68)
		13.48	14.08	16.30	-7.10
Trend	...	(-8.30)	(-8.09)	(-8.57)	(-0.39_
	0.99	0.99	0.99	1.09	0.99
δ (t-1)	(-50.91)	(-51.25)	(-51.26)	(-55.20)	(19.13)
	-0.10	-0.11	-0.11	-0.20	-0.27
δ (t-2)	(-3.6449)	(-4.1410)	(-4.1682)	(-6.6074)	(-3.84)
	0.11	0.10	0.10	0.08	0.28
δ (t-3)	(-5.67)	(-5.14)	(-5.16)	(-4.06)	(5.70)
Adj-R ²	0.99	0.99	0.99	0.99	0.99
D-W Statistic	2.01	2.01	2.01	2.00	2.04

Note: All models include monthly dummies

likely purchased from consumers in a larger geographic market. To an economic base proponent these results appear counter-intuitive. They are not.

Higher productivity in regional production will necessarily increase regional employment, while adding low-wage labor demand without higher productivity will not. It is possible that Cabela's adds labor

demand, without intra-industry productivity growth. This explains these findings, at least in the short term. Simply, if Cabela's increases regional labor demand in this sector, it may result in no net employment increase unless the productivity levels are sufficient to generate in-migration. Simply, while Cabela's may pay a higher wage, there may not be sufficient workers in the region to generate net employment increases. Economic migration for retail wages seems an unlikely outcome, even in the predominantly rural areas. Commuter rate increases offer one potentially testable hypothesis that was rejected by further analysis.⁸ Only increases in labor force participation seem at all plausible arguments to suggest net job increases.

This outcome differs from Wal-Mart since increased productivity permits local residents to divert more income to other goods (the income effect), which, if produced locally may result in the net employment and firm increases reported by Hicks and Wilburn (2001) and Basker (2003).

The argument is really not technical. If common retail goods cost less, then consumers can purchase more items leading to net employment increases among firms that provide them (the income effect) or purchase other items with the 'freed up' spending pattern (the price effect). So, a lower cost retailer could actually increase regional employment through increased demand for regionally purchased goods. A firm that sells goods which comprise a small proportion of local consumption, however, there will be no income effect to increase demand. This will not necessarily increase employment since it does not make commonly purchased goods less expensive.

A new firm entering a region certainly can result in increased net employment, but only if the wages are sufficient to bring new workers into the labor market (through increased labor force participation, migration or commuting). Retail employment is unlikely to increase the local labor pool, and thus new retail firms are unlikely to generate net employment increases. There is consistent with the evidence. Notably, there are economically meaningful impacts to the unemployment rate subsequent to the entrance of a Cabela's. The largest impact noted was a change of less than one-quarter of a percentage point change.

The very modest differences between the observed net positive impact of the Wal-Marts, and the long term-non positive net impact of Cabela's likely can be

explained empirically within labor individual firm hiring behavior. Notably, the heavy reliance on workers employed at less than full time at Wal-Mart may explain the increase. Full time employees at Cabela's explaining part of the decrease in net employment observed. There are not sufficient data to determine this as of this writing.

5. Policy Recommendations & Conclusions

The extensive labor market analysis provided above conclusively rejects the hypothesis that the presence of Cabela's stores generates net employment growth within the counties that have entered since the mid 1990's. Further, I explain why this is unsurprising given the industry and product characteristics of the firm. This impact seems also to persist when other related activities (e.g. museums) are co-located with the store, though this finding is more difficult to establish empirically.

Notably, the quality of employment opportunities at Cabela's appears to be an improvement over workers' previous employment alternatives. Since it appears that Cabela's is drawing existing workers from other firms, this would necessarily be the case, else workers would not change jobs.

It is interesting to note that the emphasis in retail sector employment observed among many economic development agencies may reflect a growing realization that, for many communities, the present human capital endowment may preclude expansion in other sectors.

These findings suggest neutral public policy towards Cabela's. So, from a public policy standpoint there is nothing to recommend regional policies to attract or dissuade the location of retail firms. More clearly, tax and economic development incentives for Cabela's stores, and similar retail facilities are possessed of less economic development efficacy than those for a Wal-Mart. The most activist recommendation regarding public infrastructure and incentive support for this type of firm is that a benefit cost analysis should be performed prior to the expenditure of public resources.

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⁸ An empirical test evaluating the employment impact of a Cabela's opening in an adjacent county found no statistically or economically significant impacts (less than 2 jobs) in each of the affected counties. This effectively rejects the cross-county commuting hypothesis as an explanation for the employment changes determined in these markets.

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