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JOURNAL OF ECONOMICS AND ECONOMIC EDUCATION RESEARCH

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We are extremely pleased to present this issue of the *Journal of Economics and Economic Education Research*, an official publication of the Allied Academies' Academy of Economics and Economic Education Research, dedicated to the study, research and dissemination of information pertinent to the improvement of methodologies and effective teaching in the discipline of economics with a special emphasis on the process of economic education. The editorial board is composed primarily of directors of councils and centers for economic education affiliated with the National Council on Economic Education. This journal attempts to bridge the gap between the theoretical discipline of economics and the applied excellence relative to the teaching arts.

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Dr. Larry R. Dale
Director Center for Economic Education
P. O. Box 2890
State University, AR 72467
e-mail; Dalex@cherokee.astate.edu
[870]-972-3416

ECONOMIC EDUCATION ARTICLES

PUBLIC VS. PRIVATE SCHOOLS: THE IMPACT ON WAGE RATES

Martin Gritsch, William Paterson University of New Jersey

ABSTRACT

Educational reform has attracted a lot of attention both in political and academic circles in recent years, and it continues to do so. Newly elected office holders at the federal as well as the state level (e.g., U.S. President George W. Bush and New Jersey Governor James E. McGreevey) made education one of the centerpieces of their respective campaigns. One of the hotly debated topics is the issue of school vouchers which would permit parents to take their children out of the public school system and send them to a private school instead. They would receive a voucher in the amount that the public system would not have to spend for educating one fewer student. So far, the experience with voucher programs is limited, but in mid-February 2002, the U.S. Supreme Court indicated that at least some of the judges held the opinion that such vouchers could be used for schools with religious affiliation without violating the separation of church and state. This suggests a possible expansion of school voucher programs in the future. Before such larger-scale voucher programs are enacted, however, it would seem desirable to gain knowledge about the relative benefits of private versus public schools. Dating back to the work of James Coleman and his colleagues (Coleman, Hoffer, and Kilgore, 1982; Coleman and Hoffer, 1987), researchers have attempted to analyze and quantify such benefits.

This paper contributes to the relevant literature in the following ways: First, unlike much of the literature (e.g., Coleman, Hoffer, and Kilgore, 1982; Coleman and Hoffer, 1987; Evans and Schwab, 1995) which uses data from the "High School and Beyond Study" as primary data source, I use the National Longitudinal Survey of Youth (NLSY79). As described in more detail in Section 2, the NLSY79 is a panel data set which is rich in information both at the individuals' level as well as at the level of the educational institution the respondents attended.

INTRODUCTION

Educational reform has attracted a lot of attention both in political and academic circles in recent years, and it continues to do so. Newly elected office holders at the federal as well as the state level (e.g., U.S. President George W. Bush and New Jersey Governor James E. McGreevey) made education one of the centerpieces of their respective campaigns. One of the hotly debated topics is the issue of school vouchers which would permit parents to take their children out of the public school system and send them to a private school instead. They would receive a voucher in the amount that the public system would not have to spend for educating one fewer student. So far, the experience with voucher programs is limited, but in mid-February 2002, the U.S. Supreme Court indicated that at least some of the judges held the opinion that such vouchers could be used for schools with religious affiliation without violating the separation of church and state. This suggests a possible expansion of school voucher programs in the future. Before such larger-scale voucher programs are enacted, however, it would seem desirable to gain knowledge about the relative benefits of private versus public schools. Dating back to the work of James Coleman and his colleagues (Coleman, Hoffer, and Kilgore, 1982; Coleman and Hoffer, 1987), researchers have attempted to analyze and quantify such benefits.

This paper contributes to the relevant literature in the following ways: First, unlike much of the literature (e.g., Coleman, Hoffer, and Kilgore, 1982; Coleman and Hoffer, 1987; Evans and Schwab, 1995) which uses data from the "High School and Beyond Study" as primary data source, I use the National Longitudinal Survey of Youth (NLSY79). As described in more detail in Section 2, the NLSY79 is a panel data set which is rich in information both at the individuals' level as well as at the level of the educational institution the respondents attended.

A second difference between the existing literature and this paper is the exact research question: While much of the previous work focuses on educational outcomes such as high school graduation (e.g., Evans and Schwab, 1995), standardized test scores (e.g., Coleman, Hoffer, and Kilgore, 1982; Coleman and Hoffer, 1987), or graduation from college (Neal, 1997), I examine the impact of private schooling on wages.

Third, while Neal (1997) also analyzes the effects of private schooling on wage rates, he focuses exclusively on Catholic schools. While examining Catholic schools has the advantage of obtaining a rich data set, it ignores the fact that many non-parochial schools are substantially more expensive than Catholic schools. To

name just one example, the leading non-parochial private school in our community (a medium-sized suburban community in the vicinity of New York City) charges annual tuition (dependent on the grade) in the range of approximately $11,500 to$18,000, hardly what is representative for Catholic private schools. Note that the inclusion of students at private schools other than Catholic schools adds a substantial number of students to the sample. While the NLSY79 does not include information about which type of private school a student attended, it is possible to obtain national frequency distributions for private school enrollment. The results of the Private School (Universe) Survey—which gets published biennially by the National Center for Education Statistics (NCES), a part of the U.S. Department of Education—can be assumed to be a good approximation for the individuals included in my data set since the NLSY79 is a nationally representative sample. I was able to obtain the results of the Private School (Universe) Surveys from 1989/90 to 1999/2000. During that period the percentage of students attending grades 9-12 at a private school which is not a Catholic school was rather steady at values between 40 and 50%. The NLSY79 respondents must have attended high school in the mid-1970s to the early 1980s since they were 14-22 years of age in 1979. Even though I was unable to obtain the respective percentage for that particular time period, it can be assumed that a substantial fraction of students at private high schools did attend a non-Catholic school. Thus, by using a data set which includes students which attend a private high school which is not affiliated with the Catholic church, new insights into the returns to private schooling can potentially be gained.

Finally, I start my analysis by running one (log) wage regression which includes a dummy variable as regressor if an individual attended a private school. This is the same approach as, e.g., in Neal (1997). Additionally, however, I estimate variations of this initial model which allow for greater flexibility.

METHODOLOGY

Data

As mentioned in the Introduction, I use NLSY79 data, survey years 1979-1993. The NLSY79 is a nationally representative panel data set that started in 1979 with 12,686 individuals who were ages 14-22 at the beginning of 1979. The participants in 1979 were 6,111 randomly sampled individuals; 2,172 oversampled blacks; 1,480 oversampled Hispanics; 1,643 oversampled economically

disadvantaged whites; and 1,280 individuals from a military sample. In 1993, 9,011 respondents continued to participate in the NLSY79.

In case of a non-response, the NLSY79 contains information on *why* the interviewee did not answer. Some answers are missing because—due to the panel nature of the NLSY79—values for some variables can be concluded from earlier waves and the interviewees do not get asked such questions again. In such cases, I change the non-responses accordingly. Non-responses for which no "appropriate" answer could be concluded were set to missing.

I use the NLSY79 data set because it includes a wealth of information well suited for the analysis of the impact of school type on earnings while controlling for a host of other possibly contributing factors. Specifically, at the individual level, the NLSY79 includes information on a person's work history including earnings and hours worked which allows the calculation of an hourly wage. Additional variables which can be used as explanatory variables in a wage regression include sex, race, and potential job market experience. Otherwise unobserved ability can be proxied by the results of the Armed Forces Qualification Test (AFQT) which 94% of NLSY79 participants completed. In terms of an individual's educational attainment, the highest grade completed is reported. Also, a dummy variable indicates whether an individual attended a private or a public high school. In addition to individual characteristics, the NLSY79 includes information on a person's family background in the form of the highest grade which his or her father and mother completed.

The 1980 wave of the NLSY79 includes a school survey which makes it particularly suited for my purposes. The high schools which the NLSY79 respondents attended were asked to submit information concerning enrollment, qualitative and quantitative aspects of their faculty, curriculum, etc. Specifically, the student-to-teacher ratio and the percentage of full-time teachers with a Master's or doctoral degree can be used in regressions as a measure of school quality.

In summary, the NLSY79 has a number of features that make it appealing for a wage regression which includes school quality measures as explanatory variables. First, the data set includes detailed information on school characteristics, not all of which is available in, e.g., the "High School and Beyond" data set, especially not in more recent years. Second, the use of data at the school level potentially eliminates measurement error and aggregation bias vis-à-vis studies that use school district or even state level data. Third, due to the panel nature of the data set, it is possible to follow individuals over time and thus examine what effect the school quality in 1979 has on the respondents' wages several years thereafter.

Estimation

Based on the pioneering work of Jacob Mincer (1957, 1958, 1974), Theodore W. Schultz (1960, 1961), and Gary S. Becker (1962, 1964), the research on the returns to education has been expanded to include additional explanatory variables which attempt to capture the influence of various school quality measures such as expenditures per student, student-to-teacher ratios, and percentage of teachers with at least a Master's degree (e.g., Card and Krueger 1992; Betts 1995; Grogger, 1996). Based on this body of knowledge, I examine what influence a student's attending a private school versus a public school has on the wage rate.

Table 1 presents the mean values and the standard deviations of the variables used in the estimations. Log hourly wages were obtained as follows: Reported hourly wages with values below $0.50 and above $100 were set to missing since they are likely to represent measurement error. The remaining hourly wages were deflated to 1990 levels using the price index for Personal Consumption Expenditures (see Economic Report of the President, 1992. Table B-3. p. 302). The natural logarithm of the resulting wage variable is the dependent variable in the wage regressions. "Highest grade completed" measures an individual's years of formal education, a variable whose influence on wages is well established in labor economics. "Sex" is a dummy variable that takes on the value zero if the individual is male and one if the individual is female. The dummy variable "Non-white" is equal to zero if the respondent is white and equal to one if the respondent classifies him- or herself as "black" or "other." The variable for potential job market experience ("Experience") is constructed as the minimum of age minus years of schooling minus 6 and age minus 17. In cases in which this construction led to negative values for the experience level (typically for individuals who were less than 17 years of age at the time of the interview or in the case of reporting error), experience is set equal to zero. "AFQT" is the individual's percentile score on the Armed Forces Qualification Test. This test was administered to the NLSY79 respondents between the 1979 and 1980 surveys; 94% of the respondents completed the test. While AFQT scores have been used in a special framework as a proxy for school quality (Maxwell 1994), I claim that AFQT does not capture school quality properly. Instead, I will use it as a proxy for otherwise unobserved ability. This approach seems to be the general consensus in the profession and is used, for instance, in Blackburn and Neumark (1995). "Father's highest grade completed" and "Mother's highest grade completed" are included since a student's background is thought to be quite important in the educational process (Neal, 1998). The student-

to-teacher ratio is calculated as the ratio of a school's enrollment to the number of full-time equivalent teachers, both taken from the school survey. Presumably, a lower student-to-teacher ratio offers higher-quality education because of the more personalized attention a teacher can provide to students. The percentage of full-time teachers with a Master's or doctoral degree is another frequently used measure of school quality. Finally, the dummy variable which measures private school attendance takes on the value one if the individual attended a private school, zero if the individual attended a public school.

Table 1: Means and Standard Deviations of Dependent and Independent Variables

Variable	Mean	Standard Deviation
Log hourly wage	6.57	0.54
Highest grade completed	12.15	2.40
Sex	0.51	0.50
Non-White	0.31	0.46
Experience	5.69	4.46
AFQT	40.67	28.86
Father's highest grade completed	11.00	3.93
Mother's highest grade completed	10.90	3.17
Student-to-teacher ratio	19.53	6.58
Percentage full-time teachers w/ Master's or doctoral degree	47.65	23.28
Students attended private school	0.06	0.23

In order to examine whether individuals who attended private schools earn higher wages than individuals who attended public schools, I start my analysis by running a pooled regression (i.e., private school plus public school students) of log hourly wages on a number of regressors that can be divided into two groups: The first group consists of variables which represent personal characteristics (education, gender, race, potential job market experience and its square, and parents' education). The variables in the second group are measures of school quality (student-to-teacher ratio, percentage of teachers with Master's or Ph.D. degrees, private or public school).

There is an ongoing debate in labor economics about potential biasedness of the Ordinary Least Squares (OLS) estimator in the context of estimating returns to schooling. In a recent article, McKinley L. Blackburn and David Neumark (1995) examine this issue and conclude: "Thus, in our NLSY79 data, OLS estimation of the standard log wage equation, including test scores, appears to provide an appropriate estimate of the returns to schooling." In order to take possible heteroskedasticity into account, all estimations in this paper are carried out using a Generalized Least Squares (GLS) procedure. While the resulting robust (Huber/White) standard errors are different from those resulting from an OLS regression, the coefficient estimates are unaffected by this procedure.

Specifically, the initial regression takes the following form:

$$(1) \qquad \ln(w_{it}) = \alpha + X'_{it}\beta + Y'_{i}\gamma + PRIVATE_i * \delta + u_{it}$$

where $\ln(w_{it})$ is the natural logarithm of the hourly wage of individual *i* in period *t*, X'_{it} is a vector of personal traits that change over time, Y'_{i} is a vector of personal traits that are constant over time, $PRIVATE_i$ is the dummy variable which indicates whether an individual attended private school, α, β, and γ are coefficients to be estimated, and u_{it} is an error term.

The regression estimates are presented in Table 2. Most of the estimates for all explanatory variables have the "correct" sign (correct with respect to economic theory or previous empirical work) and are highly significant. Exceptions are a respondent's mother's education (which is estimated to have a negative impact on wages, but is statistically not different from zero) and the student-to-teacher ratio. One might expect that a higher student-to-teacher ratio on average lowers the wage. However, as Betts (1995) points out, the majority of studies finds such a relationship at best to be weak. In light of such findings, I do not find the positive coefficient estimate too troublesome. The regression's R-squared is reasonably high for this kind of log-linear wage regression, and the F-statistic (zero, rounded to 4 decimals) clearly shows the overall statistical significance of the model. The coefficient estimate on the variable of interest, the dummy variable for private schooling is positive and highly statistically significant. In terms of magnitude, the estimate is rather substantial: All else equal, attendants of private schools earn wages which are 4.9% higher than the wages of their public-school counterparts. The finding that individuals who attended a private school tend to earn higher hourly wages than individuals who attended a public school is consistent with previous research (e.g., Neal, 1997).

Table 2: Pooled Regression of Log Hourly Wages on Personal Characteristics, School Quality Measures, and an Intercept Dummy

Variable	Coefficient Estimate	Standard Error	t-ratio
Highest grade completed	0.0645	0.0011	56.62
Sex	-0.2148	0.0038	-56.33
Non-white	-0.0249	0.0050	-5.01
Experience	0.0816	0.0014	56.62
Experience squared	-0.0035	0.0001	-33.64
AFQT	0.0030	0.0001	31.81
Father's highest grade completed	0.0029	0.0007	4.13
Mother's highest grade completed	-0.0013	0.0009	-1.53
Student-to-teacher ratio	0.0027	0.0003	7.88
Percentage full-time teachers w/ Master's or doctoral degree	0.0014	0.0001	17.03
Student attended private school	0.0494	0.0085	5.81
Constant	5.2974	0.0158	335.47
R-Squared Root MSE Number of observations	0.26 0.46 59,861		

After having established such a relationship, however, it needs to be pointed out that in a regression as in equation (1), the estimates for all the control variables are forced to be the same. Differences between the outcomes for students of public and private school can enter the model only via the intercept. That is, I can establish that there indeed is a systematic difference between the wages of students of the two types of schools, but it is not clear what causes such a difference. It might be suspected, for example, that the rates of return of the two types of schools differ systematically. In order to investigate this possibility, I estimate a variation of the model above. The new regression equation is

$$(2) \qquad \ln(w_{it}) = \alpha + X'_{it}\beta + Y'_{i}\gamma + (\text{PRIVATE}*\text{HIGRCO})_i*\zeta + u_{it}$$

where $(PRIVATE*HIGRCO)_i$ is an interaction term between the dummy for private schooling and the highest grade completed by an individual. The other variables are as defined for equation (1). Estimation results from this regression are presented in Table 3.

Table 3: Pooled Regression of Log Hourly Wages on Personal Characteristics, School Quality Measures, and an Interaction Term

Variable	Coefficient Estimate	Standard Error	t-ratio
Highest grade completed	0.0642	0.0011	56.27
Sex	-0.2148	0.0038	-56.33
Non-white	-0.0249	0.0050	-5.01
Experience	0.0815	0.0014	56.61
Experience squared	-0.0035	0.0001	-33.63
AFQT	0.0030	0.0001	31.84
Father's highest grade completed	0.0029	0.0007	4.13
Mother's highest grade completed	-0.0014	0.0009	-1.56
Student-to-teacher ratio	0.0027	0.0003	7.95
Percentage full-time teachers w/ Master's or doctoral degree	0.0014	0.0001	17.04
Schooling/private school interaction term	0.0038	0.0006	6.21
Constant	5.3010	0.0158	335.06
R-Squared	0.26		
Root MSE	0.46		
Number of observations	59,861		

The estimates for all the control variables as well as R-squared and F-statistic are very comparable to the first regression. With respect to a possible difference in the rates of return to schooling between private and public schools, I find that the coefficient estimate on the interaction term is highly statistically significant. That is, the rate of return for private school students indeed exceeds the respective rate for public school students by approximately 0.4 percentage points (6.43% + 0.38% = 6.81% versus 6.43%). In addition to being statistically

significant, a difference of that magnitude can be considered "economically significant" (cp. McCloskey and Ziliak, 1996) as well. While it is not directly clear *why* private school students enjoy a higher rate of return on their years of schooling, this result helps explain the wage premium that private school students enjoy as established in the first regression.

However, it could be further argued that an estimation including an intercept dummy *and* an interaction term is the appropriate specification. The resulting equation is

$$(3) \qquad \ln(w_{it}) = \alpha + X'_{it}\beta + Y'_{i}\gamma + PRIVATE_i*\delta + (PRIVATE*HIGRCO)_i*\zeta + u_{it}$$

Results from this estimation are in Table 4. Again, R-squared, F-statistic, and coefficient estimates for the control variables do not change substantially relative to the previous two regressions. Interestingly enough, when an intercept dummy as well as an interaction term are included in the model, the coefficient estimate on the former becomes negative while the estimate on the latter remains positive. (Both coefficient estimates are highly statistically significant.) That is, if one allows for the possibility that an individual's private schooling affects the overall level of wages as well as the rate of return to schooling, then private-school students are at a relative disadvantage at low levels of education. For somewhat more than 11 years of schooling (0.1563 / 0.0146 = 11.2) and above, the private-school students' higher rate of return more than compensates for the reduction in the constant term, and attendants of private schools have a wage advantage at these higher levels of schooling.

While I have addressed the various ways in which the dummy variable for private schooling attendance enters a (log) wage regression, I have so far constrained all other estimates to be the same for both types of schooling. This ignores the possibility that the impact of a factor such as, say, race may be different for public and private school students. In order to allow for such possible differences, I run regressions of the model in equation (1) separately for individuals who attended a private school and individuals who attended a public school. The results of these separate regressions are presented in Table 5. By and large, the results are quite similar to the pooled regression in Table 2. However, there are noteworthy differences as well. In the regression for private school students, the coefficient estimate for "Sex" indicates that the earnings disadvantage which women experience is only approximately half as large for private-school attendants than for their counterparts who attended public schools. The estimate on "Non-white"

indicates that non-white individuals from private schools are actually at an earnings advantage relative to their white private-school peers. This result is not the same as, but similar to Neal's (1997) finding that urban minorities benefit the most from Catholic schooling. Finally, the estimate on "Father's highest grade completed" becomes negative and is no longer statistically significant at conventional confidence levels.

Table 4: Pooled Regression of Log Hourly Wages on Personal Characteristics, School Quality Measures, an Intercept Dummy, and an Interaction Term

Variable	Coefficient Estimate	Standard Error	t-ratio
Highest grade completed	0.0636	0.0012	54.67
Sex	-0.2146	0.0038	-56.24
Non-white	-0.2491	0.0050	-5.01
Experience	0.0815	0.0014	56.54
Experience squared	-0.0035	0.0001	-33.59
AFQT	0.0030	0.0001	31.94
Father's highest grade completed	0.0029	0.0007	4.20
Mother's highest grade completed	-0.0014	0.0009	-1.57
Student-to-teacher ratio	0.0028	0.0003	8.16
Percentage full-time teachers w/ Master's or doctoral degree	0.0014	0.0001	17.05
Student attended private school	-0.1563	0.0555	-2.82
Schooling/private school interaction term	0.0146	0.0040	3.69
Constant	5.3072	0.0160	331.80
R-Squared Root MSE Number of observations	0.26 0.46 59,861		

Testing whether the slope coefficients on the schooling variable differ between the two groups shows that the difference is not statistically significant at the 95% level, but it is at the 90% level. Furthermore, even though the coefficients

are not estimated with high precision, the difference between them is worth considering: The estimated rate of return to schooling for public-school students is 6.4%; the respective rate for private-school students is 7.3%, i.e., it is 0.9 percentage points or approximately 14% higher.

Table 5: Separate Regressions of Log Hourly Wages on Personal Characteristics and School Quality Measures

Variable	For Public Schools			For Private Schools		
	Coefficient Estimate	Standard Error	t-ratio	Coefficient Estimate	Standard Error	t-ratio
Highest grade completed	0.0640	0.0012	54.49	0.0727	0.0048	15.23
Sex	-0.2197	0.0039	-56.04	-0.1211	0.0163	-7.45
Non-white	-0.0290	0.0051	-5.69	0.0608	0.0231	2.63
Experience	0.0801	0.0015	53.94	0.0981	0.0058	16.84
Experience squared	-0.0034	0.0001	-32.20	-0.0038	0.0004	-8.69
AFQT	0.0029	0.0001	30.32	0.0045	0.0004	10.38
Father's highest grade completed	0.0031	0.0007	4.46	-0.0031	0.0030	-1.04
Mother's highest grade completed	-0.0011	0.0009	-1.26	-0.0041	0.0039	-1.03
Student-to-teacher ratio	0.0035	0.0004	7.68	0.0012	0.0004	2.87
Percentage full-time teachers w/ Master's or doctoral degree	0.0014	0.0001	16.22	0.0018	0.0004	4.81
Constant	5.2974	0.0172	307.53	5.1250	0.0650	78.89
R-Squared	0.2538			0.3225		
Root MSE	0.4617			0.4687		
Number of Observations	56,459			3,402		

SUMMARY AND POLICY IMPLICATIONS

The estimation of wage equations has a long tradition in economics, going back almost half a century. Using NLSY79 data, I confirm previously obtained results in the literature that, on average, individuals who attended a private high school earn higher hourly wages than those who attended a public school. I then go on to show that the rates of return to schooling differ between public and private schools. This result holds whether an intercept dummy is included in the model or not. Finally, separate regressions for the two groups–which allow all the coefficient estimates to vary across the two groups of individuals–suggest that indeed the rates of return ro education differ between public and private schools. While this difference is not estimated with high precision, it is rather sizable. Overall, a summary of the results presented here is that, on average, individuals reap a financial reward from attending a private school.

Beyond being of interest to labor economists, this result has some policy implications. One of them is the possibility of expanding voucher programs, an issue which both continues to be of interest in political circles and deserves more attention from researchers. In principle, if a student attends a private school rather than a public one, individuals would receive the amount of money that the public system saves by not educating an additional student, i.e., the marginal cost. This paper raises an additional issue, however. In the design of a voucher program, it should be considered that a private school education has the benefit of ultimately raising the average private school attendant's wage. If further research confirms this finding, this result might be used to justify a reduction in the dollar amount of vouchers since it can be argued that individuals opting out of the public system will typically receive the future benefit of increased compensation.

The issue of what kind of expanded voucher program–if any at all–will be introduced in the future is a political one, but it is clear that economic research needs to provide the relevant information to policymakers for them to make sound political decisions.

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ECONOMICS ARTICLES

THRESHOLD MARKET ANALYSIS OF WESTERN NORTH CAROLINA

James Ullmer, Western Carolina University
Inhyuck "Steve" Ha, Western Carolina University

ABSTRACT

A predictive model is developed to ascertain the suitability of local retail markets to support new business locations as a prerequisite to designing effective development strategies. This paper explores the feasibility for the establishment of new retail enterprises in the twenty-three counties of Western North Carolina. This paper uses a unique method involving ZIP codes to identify fifty-two distinct markets. The tourist demand index is developed by using visitor information. The number of actual business establishments in a market is compared to the predicted number to determine where markets are saturated and where new business entry is feasible.

INTRODUCTION

Ascertaining the capability of a rural market to support a particular type of business enterprise is a prerequisite to designing effective development strategies. Several factors can contribute to the vitality of a local retail market, but the most fundamental one is the size of the market in terms of potential customers. Consequently, business owners and regional development specialists frequently inquire about the population base necessary to provide adequate revenues for a particular type of business.

The Southern Appalachian Mountains are the unique geographic feature of Western North Carolina. In terms of demand in the retail sector of the economy, they have a profound influence on the highway design and the subsequent buying patterns of people living in the mountains. Moreover, the demand for retail goods associated with tourism is also significantly influenced by this same mountain landscape.

Standard location quotient methods are inadequate tools for defining relevant market areas in such regions. Topography is as important as distance in

defining the bounds of local retail markets in such areas. This study incorporates the effects of topography in defining local retail markets. The Southern Appalachians, which includes the Great Smoky Mountains National Park—the most visited national park in the National Park System—plays another role in retail demand in the region. It creates year-round tourist demand in Western North Carolina. The model developed in this research attempts to capture both the local demand and tourist demand for the various local retail markets the 23 counties of Western North Carolina in an attempt to identify potential business opportunities in retail trade in the region.

In this research, demand threshold analysis is employed as the tool for market investigation. Population thresholds are traditionally defined as the minimum population needed to support a particular type of retail establishment at an acceptable rate of return on investment (Shaffer, 1989). There have been many estimates of market thresholds in the past (See Berry and Garrison, 1958a and 1958b; Murray and Harris, 1978; Salyards and Leitner, 1981; McConnon, 1989; Schuler and Leistritz, 1990; Deller and Harris, 1993; Coon and Leistritz, 2002). This study deviates from existing research in two distinct ways. First, this paper employs a unique method of market identification involving ZIP codes, which will be explained in the following section. Secondly, a proxy variable involving souvenir shops is incorporated in our model to estimate tourist demand. Hence, the model developed in this study employs two independent variables—population to capture retail demand and a proxy variable for tourist demand.

This analysis concludes with a threshold matrix for potential business location in the region. The number of actual business establishments is compared to the number of predicted establishments in each retail activity—as determined by our threshold analysis—in the attempt to identify potential opportunities for new business location. The study will begin with a discussion of our method.

METHOD

Postal delivery routes in the 23 contiguous counties of Western North Carolina were—and are—heavily influenced by mountain geography where ridge lines and mountain valleys (coves) gave rise to highly irregular postal regions that mimicked the topography, which are evident today in ZIP code boundaries. These same geographical features are evident in the shopping patterns of retail customers in the region. For example, a consumer may shop in his or her mountain cove, even though retail establishments twenty miles closer are just over the ridge line. With

this phenomenon in mind, it appeared that the most propitious method for defining local markets was to identify them as unique combinations of postal ZIP codes.

Two sources of information were tapped to delineate these individual markets. First, a series of telephone surveys concerning consumer buying patterns was conducted with Directors of the various chambers of commerce in the Western North Carolina Region. Second, the knowledge of economic development specialists of the Institute for the Economy of the Future was obtained. These development specialists were also long-time inhabitants of the region, and shared both their personal and professional expertise about the shopping patterns of the region. This process yielded 52 distinct markets that could be identified as combinations of ZIP codes. A table of the 52 markets and their identifying ZIP codes can be found in the appendix (See Appendix 1).

The data concerning the population of each ZIP code was taken out of *The Sourcebook of ZIP Code Demographics*, 16th edition, published in 2002. Unlike some similar studies, this research used the North American Industry Classification System (NAICS) instead of the old Standard Industrial Classification (SIC) to determine the number of permit holders by retail activity for all ZIP codes in Western North Carolina (ZIP Code Business Patterns 2002). Data on the number of business establishments—both in terms of the raw number of business concerns and total number of employees—was gathered by the three digit NAICS code for all types of activity in the retail trade sector of the economy, as well as for the retail related industries of Accommodations and Food Services & Drinking Places. Altogether, data for fourteen different industries was gathered. A description of the different industries and the number of establishments and employment in each industry in Western North Carolina is given in Table 1.

MODEL

Previous research that has dealt with the study of rural retail trade has employed models in which population was the dependent variable and the number of establishments was the independent variable (Schuler and Leistritz, 1990; Deller and Ryan, 1996; Coon and Leistritz, 2000). The dependent variable in this study is the number of business establishments in each market—which can be argued to be more consistent with economic theory—as determined by the number of business permits issued. The data for the independent variable used to capture local demand was obtained from the 2000 population figures for each market area.

Table 1. Number of Establishments by Industry			
NAICS 3-Digit	Industry Description	Industry Statistics	
		No. of Firms	Employment
441	Motor vehicle & parts dealers	687	7120.5
442	Furniture & home furnishings stores	335	2129.5
443	Electronics & appliance stores	153	1061.0
444	Building material, garden equipment & supplies dealers	459	6998.0
445	Food & beverage stores	513	12049.5
446	Health & personal care stores	302	3808.0
447	Gasoline stations	691	4290.5
448	Clothing & clothing accessories stores	543	4117.5
451	Sporting goods, hobby, book & music stores	266	1734.0
452	General merchandise stores	222	10583.0
453	Miscellaneous store retailers	701	3595.5
454	Non-store retailers	188	1541.0
721	Accommodations	521	9187.0
722	Food services & drinking places	1750	31484.0
	Total	7331	99699.0
Source: ZIP Code Business Patterns 2002			

Communities that rely heavily on tourist demand—as is the usual case for municipalities in western North Carolina—have been shown to have approximately twice the number of retail establishments that don't have tourism as an essential component of demand (Ryan, 1998). Consequently, another unique aspect of this study is that a second independent variable was employed in an attempt to capture tourist demand. The number of souvenir shops weighted by the number of employees was used as a proxy for tourist demand[1]. Hence, the following linear equation was specified to capture the effects of both local and tourist demand on retail establishments:

$$BP_{ij} = \beta_0 + \beta_1 P_{ij} + \beta_2 T_{ij}$$

Where: BP_{ij} = number of business establishments of NAICS group j in market i, P_{ij} = level of population of group j in market i, T_{ij} = number of souvenir shops weighted by the number of employees of group j in market i, and β_0, β_1, and β_2 are parameter vectors of each group j.

INTERPRETATION OF REGRESSION RESULTS

The ordinary least square (OLS) regression results in the various markets for each particular industry are shown in Table 2. The coefficients for the parameter estimates of both independent variables are revealed as well as their accompanying t-statistics. The critical value for $t_{49/.05} = 2.01$ and the critical value for $t_{49/.01} = 2.88$. The adjusted R-squares are disclosed as well as the F-statistic for each industry. The critical value for $F_{2/49/.05} = 3.08$ and the critical value for $F_{2/49/.01} = 5.06$. Finally, elasticity estimates were obtained on both the population and tourism variables.

The interpretation of the coefficient estimates on the independent variables in the model is straight forward. The parameter estimates for population (X_1) attempts to capture the effects of local retail demand on the number of establishments for each retail activity in each market. On the basis of the population parameter estimate for the motor vehicle and parts dealer industry (NAICS code 441), 1445 (the reciprocal of the coefficient, .692) people are necessary to generate sufficient local demand for one retail establishment. All of the parameter estimates on population are statistically significant at .05. In fact, all t-values on this variable that attempts to capture local demand, except for the accommodations industry, are significant at .01.

The approximate number of employees in souvenir shops (X_2) is a proxy variable that attempts to capture the effects of tourist demand on the number of local establishments. The parameter estimates for each industry are positive, as expected, and for the most part are statistically significant, an indication that employment in souvenir shops is a reliable proxy variable. The t-statistics on tourism are significant at .05, except for NAICS code 441, motor vehicle and parts dealers, NAICS code 444, building material, garden equipment and supplies dealers. The insignificant t-value on the tourism variable in the motor vehicle and parts industry is not surprising in that tourists would not likely buy or service their automobiles in tourist areas—except in an emergency. A similar result in the building material, garden

equipment and supplies dealers classification is somewhat expected because those purchases would logically be almost entirely from local demand.

Table 2. Linear Regression Results of the Threshold Models

NAICS 3-Digit	Intercept		Population (X_1)			Souvenir Shops (X_2)			Adj. R-sq	F-value
	Coeff.	t-stat	Coeff.		t-stat	Coeff.		t-stat		
441	-0.630	-0.58	0.692	***	17.25	0.015		0.62	0.867	167.9
442	-0.621	-0.69	0.291	***	8.67	0.065	***	3.25	0.686	56.8
443	-0.211	-0.58	0.128	***	9.46	0.030	***	3.77	0.728	69.2
444	0.680	-0.83	0.406	***	13.35	0.010		0.57	0.797	101.1
445	0.175	0.28	0.427	***	18.69	0.063	***	4.60	0.901	233.2
446	-0.497	-1.04	0.274	***	15.51	0.044	***	4.19	0.865	164.2
447	0.689	0.89	0.624	***	21.75	0.020		1.15	0.913	270.1
448	-0.254	-1.15	0.245	***	4.03	0.276	***	7.62	0.663	51.3
451	-0.505	-0.66	0.174	***	6.12	0.104	***	6.15	0.676	54.2
452	0.253	0.62	0.178	***	11.73	0.025	***	2.75	0.779	91.0
453	0.484	0.44	0.365	***	9.01	0.275	***	11.40	0.855	151.1
454	0.611	1.50	0.119	***	7.94	0.031	***	3.51	0.662	50.9
721	1.938	1.30	0.124	**	2.25	0.265	***	8.09	0.633	45.0
722	0.061	0.03	1.319	***	16.34	0.367	***	7.63	0.896	221.3

*** significant at 99%, ** significant at 95%

The high adjusted R-squares for the regression equations in each industry indicate that the model has good explanatory power. Moreover, the estimated F-statistics for all of the regression equations are statistically significant at .01. These two results—high R-squares and significant F-statistics—indicate that the model employed in this study is a reliable predictor of market thresholds.

Finally, elasticities were calculated for both population and tourism. The elasticity coefficients for each independent variable are shown below in Table 3. While the elasticity coefficients on each variable were inelastic, except in one instance, the location of business establishments seems much more sensitive to local demand than tourist demand, at least as measured in this study.

Table 3. Elasticity Estimations on Population and Tourism				
NAICS 3-Digit	Industry Description	Mean of Business Permits	Elasticity	
			Population	Tourism
441	Motor vehicle & parts dealers	13.21	1.02	0.01
442	Furniture & home furnishings stores	6.44	0.88	0.05
443	Electronics & appliance stores	2.94	0.85	0.05
444	Building material, garden equipment & supplies dealers	8.83	0.90	0.01
445	Food & beverage stores	9.87	0.85	0.03
446	Health & personal care stores	5.81	0.92	0.04
447	Gasoline stations	13.29	0.92	0.01
448	Clothing & clothing accessories stores	10.44	0.46	0.13
451	Sporting goods, hobby, book & music stores	5.12	0.66	0.10
452	General merchandise stores	4.27	0.81	0.03
453	Miscellaneous store retailers	13.48	0.53	0.10
454	Non-store retailers	3.62	0.64	0.04
721	Accommodation	10.02	0.24	0.13
722	Food services & drinking places	33.65	0.77	0.05
Mean of Population (in thousands) = 19.53, and mean of tourism = 4.73				

THRESHOLD MATRIX

The model developed in this research appears to have significant explanatory power as indicated by the high adjusted R-squares and very significant F-statistics. Therefore, a threshold matrix for potential business location was developed in the following manner. First, the regression equations for each of the fourteen different industries in the study were used to calculate the predicted number of business establishments for each of the 52 markets in the region. By comparing the predicted number of businesses for each industry in each market with the actual number of establishments for those respective industries in those respective markets, the potential for new business locations can be identified. If the predicted value is

greater than the actual value, the potential for new business may exist. The threshold matrix is shown below in Table 4. A positive number indicates location potential, whereas a negative value denotes market saturation.

Table 4. Threshold Matrix - Potential Number of New Establishments

Market	441	442	443	444	445	446	447	448	451	452	453	454	721	722
Andrews	1	-1	0	-1	-1	0	-3	0	1	-1	-1	2	-1	-3
Arden	3	3	1	-4	4	4	6	3	2	4	-1	-3	-3	3
Asheville-East	0	3	-4	4	4	-1	1	-28	-3	-4	17	3	21	-3
Asheville-North	3	-2	3	0	-10	-4	0	0	-10	3	-11	-6	0	-41
Asheville-South	7	-6	-4	-2	-3	-5	-1	2	-1	-1	-6	-3	3	-22
Asheville-West	-17	-4	0	5	3	-2	-1	-17	0	-1	-12	-3	0	11
Bakersville	0	1	1	2	3	1	3	2	1	1	1	-2	3	4
Barnardsville	1	-1	-1	2	1	0	2	0	0	1	2	1	-1	1
Black Mountain	4	0	1	2	-7	1	2	8	-4	1	-1	-1	1	-7
Blowing Rock	3	-12	2	-3	3	0	0	-12	4	1	-1	0	-4	7
Boone	-8	-2	-2	-5	3	-1	-4	-12	-16	-2	-2	-5	-3	-18
Brevard	3	7	-1	-4	4	-2	7	4	-3	2	2	2	-8	2
Bryson City	-6	-2	-1	0	-6	-1	0	0	-2	0	2	1	-16	-3
Burnsville	0	-2	1	-3	-1	2	-2	1	-2	-4	-2	0	-2	5
Cashiers	-1	-6	1	-3	-4	-1	-1	-2	-1	-1	-7	-3	-4	-8
Cherokee	7	10	4	5	2	8	1	31	6	4	-1	2	-11	31
Columbus	4	2	0	2	1	2	3	3	2	1	3	2	3	3
Elkin	-5	-2	-1	6	0	2	-2	10	8	-2	15	2	17	8
Forest City	-12	2	5	5	4	2	-2	1	1	-3	1	0	7	19
Franklin	-9	-3	-2	-7	-3	1	0	-8	1	-3	-3	-3	-6	-7
Hayesville	-3	-1	-1	-4	0	-1	-1	1	-1	-2	0	1	0	5
Hendersonville	0	-4	-2	-13	1	-5	7	0	-5	4	-2	0	-5	-4
Highlands	1	-5	-3	-6	-5	1	0	-10	-1	2	-14	2	4	-3
Hot Springs	1	0	0	2	1	-1	0	0	-2	1	1	1	0	2
Jefferson	0	1	-1	-1	1	0	0	0	1	-3	1	-1	0	-3
Lake Lure	0	1	0	0	-1	1	-1	3	1	1	0	0	-4	-8
Lansing	2	-1	-1	2	0	0	2	0	0	1	2	1	2	2
Leicester	2	2	0	1	3	2	6	2	1	1	2	2	3	11
Lenoir	4	-14	-2	3	-1	2	-11	1	1	0	4	3	7	3
Linville	-1	0	0	0	-3	-2	-2	1	-1	0	0	1	-1	-4
Marion	-1	3	-2	5	-1	2	-5	2	5	-1	1	-1	1	-6

Table 4. Threshold Matrix - Potential Number of New Establishments

Market	441	442	443	444	445	446	447	448	451	452	453	454	721	722
Mars Hill	2	1	1	4	1	-1	2	2	0	1	3	1	1	5
Marshall	1	2	1	-1	2	0	5	2	0	0	3	-1	2	6
Millers Creek	4	2	1	2	3	1	3	1	1	1	4	0	3	6
Morganton	15	11	2	10	-4	2	8	-2	5	0	8	5	7	1
Murphy	-1	-3	-3	-3	1	-3	-4	-12	-2	-3	0	-2	-2	-14
Nebo	3	1	1	4	3	2	2	2	1	1	3	1	3	8
Newland	9	-3	1	-3	-3	1	4	0	-3	0	-6	0	-4	-8
North Wilkesboro	-4	7	1	-2	3	2	-1	2	0	2	2	-2	7	5
Robbinsville	-2	1	0	0	0	-2	-4	2	1	-2	1	1	-4	2
Rosman	2	1	0	3	-1	0	1	2	0	0	2	1	-2	2
Rutherfordton	4	4	1	3	0	1	-3	0	3	2	3	1	2	-2
Sparta	1	3	-1	1	2	1	-2	0	-1	0	0	0	1	-3
Spindale	-2	0	-2	-1	0	-1	-3	-1	0	-1	-2	0	0	-8
Spruce Pine	-3	-1	0	-3	1	-3	-3	-4	-3	0	-2	-2	-1	4
Swannanoa	-3	-2	1	4	0	-2	3	0	0	1	3	0	2	6
Sylva	2	6	-1	3	0	1	-2	1	5	1	2	1	10	5
Tryon	0	0	1	1	-3	-4	1	2	1	1	-9	-1	-1	-11
Waynesville	1	2	1	-2	2	-1	-4	18	6	-5	-5	1	-30	11
Weaverville	7	3	2	0	0	2	5	0	2	3	-1	-2	-2	9
West-Jefferson	-6	0	0	-8	-1	1	-2	-2	-1	-1	1	1	2	6
Wilkesboro	-9	2	0	1	0	0	-9	-1	1	1	0	1	2	-10

Estimate = Predicted Value - Actual Value

Some markets in the matrix indicate a high degree of saturation. This outcome is misleading in the Asheville and Hendersonville market areas. These two urban areas—especially Asheville—are regional hubs. The retail demand in those does not just consist of just local and tourist demand, but also attracts considerable regional demand.

LIMITATIONS

Although the model developed in this research appears highly reliable, when considering a revitalization program as a community leader or opening up a new business of a certain type in a market included in this study, two limitations of this

study should be mentioned. First, the calculated results of possible room for additional establishments of a certain kind do not guarantee that a new business will be profitable. There might be reasons people stay in business even they are incurring economic losses—i. e., they may have some non-economic motive for being in business. Such behaviour, not uncommon in some retail endeavours, could not be captured in this study.

One more thing to consider is that according to the NAICS codes, a business might be classified in a certain type of retail activity, while also offering goods and services in another area of retail trade. For example, a full-service hotel could also have a restaurant, but may be only coded as a hotel, but not as a restaurant. A mass merchandiser such as Wal-Mart may be coded as a "general merchandise store," hiding the fact that it competes with shoe stores, music stores, electronic stores, apparel stores, or other retail categories having their own NAICS code.

No potential entrepreneur should base his or her decision on whether to open up a new establishment strictly on the basis of this study. However, it can provide initial information on whether it may be feasible or not to open a certain type of establishment in a specific market. Possibilities for further research could include a more refined study that involves the usage of four, five or six digit NAICS codes, instead of the broader three digit code employed in this study. Then one could, for instance, check for market saturation in a narrowly defined industry such as sporting goods.

CONCLUSION

The novel demand threshold analysis employed in this study provides regional economists with a new method for defining the boundaries of local markets when topography—in this case, the Southern Appalachians—has a major effect on retail shopping patterns. By using ZIP code information, local retail markets were defined, and secondary data on both the dependent and independent variables was obtained. Moreover, the innovative econometric model developed by this research—which has business permits as the dependent variable, and includes explanatory variables for both local and retail demand—seems to be well specified. Both t-statistics on the independent variables and the test for overall fit—adjusted R-squares and F-statistics—are, for the most part, highly significant.

ENDNOTES

[1] The weighting was done in the following manner. Employment data was available only in ranges. The mid-point of each range was used as the weighting component. The operative ranges were: 1-4, 5-9, 10-19, 20-49.

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Appendix Table 1. Market Area by ZIP Codes

Market	Popul-ation	ZIP Codes								
Andrews	8603	28901	28905							
Arden	34872	28704	28732	28730	28776					
Asheville-East	16089	28805								
Asheville-North	32948	28804	28801	28810	28814	28815	28802			
Asheville-South	24660	28803	28813							
Asheville-West	54884	28806	28715	28816	28728					
Bakersville	7403	28705								
Barnardsville	2954	28709	28757							
Black Mountain	17027	28711	28770	28762						
Blowing Rock	3098	28605								
Boone	38400	28607	28618	28679	28684	28691	28692	28698	28608	
Brevard	24437	28712	28768	28766	28718					
Bryson City	8900	28713	28702	28733						
Burnsville	14145	28714	28740	28755						
Cashiers	2827	28717	28774	28736						
Cherokee	11670	28719	28789							
Columbus	12090	28722	28756							
Elkin	26255	28621	27020	28642	28676	28683	28668			
Forest City	42673	28043	28018	28019	28020	28024	28040	28074	28076	28114
Franklin	26856	28734	28763	28775	28781	28744				
Hayesville	9151	28904	28902	28909						
Hendersonville	78218	28739	28791	28792	28742	28758	28760	28784	28790	28710
		28726	28729	28731	28735	28727	28724	28793		
Highlands	2975	28741								
Hot Springs	2359	28743								
Jefferson	6783	28640	28631	28617						
Lake Lure	2090	28746	28720							
Lansing	3304	28643								
Leicester	9360	28748								
Lenoir	75880	28645	28638	28667	28630	28611	28633	28661		
Linville	354	28646	28616	28664	28662	28653	28641			
Marion	29864	28752	28749	28737						
Mars Hill	9515	28754								
Marshall	11122	28753								

Appendix Table 1. Market Area by ZIP Codes

Market	Popul-ation	ZIP Codes								
Millers Creek	8428	28651	28665							
Morganton	80880	28655	28612	28637	28671	28690	28666	28628	28680	
Murphy	15301	28906								
Nebo	7421	28761								
Newland	19905	28657	28622	28604						
North Wilkesboro	35325	28659	28635	28649	28669	28670	28685			
Robbinsville	7218	28771								
Rosman	4473	28772	28708	28747	28708					
Rutherfordton	19214	28139	28167							
Sparta	11310	28675	28663	28644	28627	28623	28672			
Spindale	3932	28160								
Spruce Pine	9129	28777	28765							
Swannanoa	9459	28778								
Sylva	22348	28779	28723	28788	28783	28725				
Tryon	7240	28782	28773	28750						
Waynesville	54257	28785	28786	28751	28745	28721	28716	28707	28738	
Weaverville	18996	28787	28701							
West-Jefferson	12587	28694	28693	28626	28615	28629				
Wilkesboro	16421	28697	28606	28624	28654					

IMPACT OF GAMING INDUSTRY ON LOCAL EMPLOYMENT AND PERSONAL INCOME

P. Michael McLain , Hampton University
Sharad K. Maheshwari, Hampton University

ABSTRACT

In the last decade gaming industry has grown steadily in the United State. According to American Gaming Association, its revenue has more than doubled between 1993 and 2003 from $34.7 billion to $72.87. Moreover, the casino gambling industry has spread from its traditional base in Nevada and New Jersey to the Gulf Coast, the Midwestern states and many other locations in the country including building of a large number of Native American casinos. However, community debate still continues whether to treat the gaming industry as any other business or treat it as a negative business necessary only to revitalize a community or to increase the revenue base for a given city and the state. Different state and local authorities provide different arguments in favor or against the industry. But the success of New Jersey approach in the Atlantic City to use casino industry as a revitalization tool for the community remains a very inspiring model.

However, it is important to note that not all gaming solutions result in the intent revenue increase, job growth or other socio-economic benefits for the local community. For example impact of gaming has been less than successful in many Native American experiments. In many Native American casino business has been slow and/or impact on the concerned Native Indian population has been much less than projected or in some cases it has been negative.

The purpose of this research is to study the impact of gaming, mainly casino industry, on the local community and how the economic impact varies with the size of population in the local community. This research will focus only on the communities where casino has made entry during the period of 1990-2000. That is, this study will exclude all old established gaming/casino centers. We will select a sample of thirty casino communities. For each center, we will collect data for 9 years. This will include 4 years of data prior to opening of major casino center, year of opening and 4 years after casino centers has been in existence. The data for

this research will largely come from the Bureau of Labor Statistics and Bureau of Economic Analysis. The American Gaming Association will be the sources for the casino profiles data.

INTRODUCTION

In general the conclusions of previous research studies, regarding economic impact of gambling at the macro level, vary from somewhat positive to very negative. These differences between various research studies can largely be accounted by the methodology of performing the cost and benefit analysis of gambling industry. Many studies show (or assume) very high socio-economic cost of gambling (addiction, family breakup, incarceration, etc.) thus negates all the economic benefit of gambling to a community. Even though the evidence is very inconclusive in last two decades, an increasing number of states passed legislation to allow some form of gambling within their borders. The legislative rationales vary for this action but in general increase state revenue and/or rejuvenation of a depressed region in the state remain the basic motivating factors. In the United States, eleven states have legalized casino gambling. These states are Colorado, Illinois, Indiana, Iowa, Louisiana, Michigan, Mississippi, Missouri, Nevada, New Jersey, and, South Dakota. In addition, 28 states have Indian casinos. Little or economic data is available about Indian casinos. These casinos are not included in this study.

In this research, we considered regions where casino gambling has stated after 1990 therefore, excluding the states of Nevada and New Jersey. The states where annual casino revenues are less than one billion are not included in the studied. It is assumed that the economic impact of small revenue generating casinos may not very significant on the region. This excludes the states of South Dakota and Colorado. Most other new casinos regions are located into southern states of Louisiana and Mississippi or in mid-western states of Illinois, Indiana, Iowa, Missouri and Michigan. The main objective of this study is to assess the economic impacts of casino businesses in the regions directly impacted by the casino businesses.

The gaming industry has expanded in the United States since Nevada first legalized gaming in 1931. The gaming industry now is over a 72 billion dollar industry. Gaming casino areas are now considered destinations with other activities beyond the original gaming activities.

Gaming has expanded beyond Nevada into Mississippi, Illinois, New Jersey, and a variety of other midwestern areas. In addition, the gaming industry has moved into Native American areas to bypass the stigma related to gaming. The argument of inserting gaming into Native American areas is to provide jobs and economic development. Gaming is considered a tool for revitalizing depressed areas. This was the primary reason for allowing Atlantic City to offer gaming.

Politicians have also seen the gaming industry as a means of increasing the flow of funds into the government coffers. Permitting ever increasing spending.

The purpose of this study is to examine the impact of the gaming industry on the local community. The purpose is to examine if the gaming industry provides for increased income to the residents of the local community. This study does not examine the social impact of introducing the gaming industry into an area.

Most previous studies examine the impact of a single casino on an area. The purpose of this study is to examine the impact of the gaming industry across a spectrum of new casinos. This study does not examine the impact of older established casinos or casino towns. It attempts to look at the impact of newer casinos in newer locations.

A sample of thirty casinos will be chosen from a variety of different locations.

LITERATURE REVIEW

This paper discussed the impact of the gaming industry on economic development. When discussing the gaming industry a variety of different forms of gaming can be involved. This paper limits is discussion of gaming to a casino type of format. This paper will not examine the impact of unregulated gaming which may be found around the casino due to the limited data available.

During the past century gaming has increased from a very restricted area of Nevada. The gaming industry has moved from a single state into an industry which is now located in about 48 states. With the introduction of internet gaming the industry now has the ability to reach almost everyone.

Some states view gaming as an industry which will increase job growth and provide additional tax revenues for the politicians to use. Many prior studies have been plagued by bias by the researcher. The gaming industry can create a variety of social ills along with the potential economic advantages. *National Gambling Impact Study Commission Final Report*, provides a listing of the hazards of viewing

the gaming industry as a form to eliminate high unemployment rates and to provide for new funds for politicians spending habits.

Gaming casinos can be categorized into two different types of locations. There are destination casino locations, such as Las Vegas, which bring into the area a broad type of clientele. The other casino location is the stand alone casino, which has a more limited clientele and provides a different economic environment.

The *National Gambling Impact Study Commission Final Report* did not receive support from the Indian gaming industry. This issues revolves around the sovereignty of the Indian Tribal Reservations under the United States Constitution.

The *National Gambling Impact Study Commission Final Report* found that Mississippi's unemployment rate declined after the introduction of casinos. But, the decline was similar to that as the economy as a whole. "The rate decline from 8.2 percent in 1992 to 4.8 percent in 1998. The national unemployment rate declined from 7.5 percent to 4.1 percent during the same period." (*National Gambling Impact Study Commission Final Report*).

The NORC found that "increased per capita income in the construction, hotel, and lodging, and recreation and amusement industries. However, no change is seen in the overall per capita income as the increases noted above are offset by reductions in welfare and transfer payments as well as a drop off in income from restaurants and bars." More income was obtained from working and less income was obtained from transfer payments. (*National Gambling Impact Study Commission Final Report*).

Casinos generally have low paying jobs. Most positions pay the minimum wage or sometimes higher. Casinos generally do not offer a lucrative benefits package to the employees.

Only eleven states permit casino operations outside of the Indian casino states. The states are Nevada, New Jersey, Iowa, Illinois, Mississippi, Louisiana, Colorado, South Dakota, Indiana, and Michigan. Louisiana only permits one land based casino to operate in the state at the site of the Convention Center in New Orleans. New Jersey limits its casino operations to Atlantic City, while a number of states permit casinos only along navigable rivers. (Iowa, Illinois, Mississippi, Louisiana, and Missouri).

Arthur Anderson (1997) and Walker and Jackson (1998) discussed the economic gains from placing a casino in a town. But, since the studies were completed additional areas have been opened to casino development.

The decision on the location and placement of the casino industry has been left to communities in need of tax revenue or to spur economic growth in a declining

area. Very little consideration is given to the consumer's desires of location of where they would like to have a casino operation (Eadington, 1999). One reason is the negative feelings surrounding the gaming industry.

DATA COLLECTION

The data for this study was collected from three sources. Data on gambling revenues, initiation dates of gambling and locations was obtained from American Gaming Association. The regional economic data was collected from the Regional Economic Account (REIS) maintained by Bureau of Economic Analysis at the US Department of Commerce. The REIS provided data on each MSA (Metropolitan Statistical Area) or CSA (Combined Statistical Area) where casinos are located. These MSAs or CSAs are Chicago, IL; Gary, IN; Des Moines, IA; Detroit, MI; New Orleans, LA; Baton Rouge, LA; Gulfport, MS and Tunica (Memphis Metro Area), MS.

The REIS provided per capita personal income data on each of the selected region. The regional urban inflation data was obtained from the Bureau of Labor Statistics. This data is used to adjust the per capita personal income for each region. The inflation data used in the study assumes 1983 as it base for calculation of annual inflation. No direct unemployment figures were available in the REIS. The unemployment figures were available with the Bureau of Labor Statistics but these figures were not categorized in the same MSA and CSA as in the Bureau of Economic Analysis data. Therefore, employment was calculated as a ratio of population and full or part-time employment. The data on population and number of people employed in each MSA or CSA were obtained from the REIS. A twenty-year time period is covered in this study from 1983-2002.

ANALYSIS

In this study, the economic impact of casino industry is measured in terms of two outcomes—per capita personal income and employment. The per capita personal income was adjusted for the regional inflation before the analysis. The employed was calculated as a ratio of full and part-time employment to the total population in a given region. The national data on employment and per capita personal income is included in Table 1.

The Tables 2-9 provide the per capita personal income and employment data for each region under consideration. To measure the impact on these two

variables, differences between regional and national per capita personal income and employment are calculated. These differences in per capita personal income and employment for each region are also included in the Tables 2-9.

Table 1: National Data on Employment and Personal Income

Year	Adjusted Per Capita Personal Income (CPI base 1983)	Percentage Employed
1983	$ 12,618.00	49.64%
1984	$ 13,369.59	51.35%
1985	$ 13,715.61	52.33%
1986	$ 14,08942	52.88%
1987	$ 14,29577	53.82%
1988	$ 14,65004	55.01%
1989	$ 14,93548	55.59%
1990	$ 14,90207	55.84%
1991	$ 14,60499	54.79%
1992	$ 14,86386	54.25%
1993	$ 14,77232	54.55%
1994	$ 14,96086	55.19%
1995	$ 15,14173	55.95%
1996	$ 15,40790	56.48%
1997	$ 15,78442	57.07%
1998	$ 16,49264	57.87%
1999	$ 16,77011	58.40%
2000	$ 17,33275	59.10%
2001	$ 17,23715	58.55%
2002	$ 17,17954	58.00%

Table 2: Per Capita Personal Income and Employment Data for Gulfport, MS				
Year (Casino Operations Started in 1992)	Adjusted Per Capita Personal Income	Percentage of Population Employed	Difference Between Regional and National Employment Ratio	Difference Between Regional and National Per Capita PI
1983	$ 9,541.00	47.57%	-2.07%	$ (3,077.00)
1984	$ 10,089.60	48.77%	-2.07%	$ (3,279.99)
1985	$ 10,175.63	48.54%	-3.79%	$ (3,539.98)
1986	$ 10,288.34	48.79%	-4.08%	$ (3,801.08)
1987	$ 10,670.11	48.91%	-4.91%	$ (3,625.67)
1988	$ 10,995.88	50.14%	-4.87%	$ (3,654.17)
1989	$ 10,994.24	51.07%	-4.52%	$ (3,941.25)
1990	$ 10,821.74	50.73%	-5.10%	$ (4,080.33)
1991	$ 10,888.64	50.63%	-4.16%	$ (3,716.35)
1992	$ 11,144.32	50.71%	-3.54%	$ (3,719.54)
1993	$ 11,726.56	55.23%	0.69%	$ (3,045.76)
1994	$ 11,837.32	57.68%	2.49%	$ (3,123.55)
1995	$ 12,015.44	56.27%	0.32%	$ (3,126.30)
1996	$ 12,203.02	57.36%	0.88%	$ (3,204.88)
1997	$ 12,313.07	58.91%	1.84%	$ (3,471.36)
1998	$ 12,866.90	60.37%	2.50%	$ (3,625.74)
1999	$ 13,283.95	62.23%	3.83%	$ (3,486.16)
2000	$ 13,530.98	61.75%	2.65%	$ (3,801.77)
2001	$ 14,061.95	60.93%	2.38%	$ (3,175.20)
2002	$ 14,109.12	60.87%	2.87%	$ (3,070.43)

Table 3: Per Capita Personal Income and Employment Data for Memphis Metro, TN				
Year (Casino Operations Started in 1992)	**Adjusted Per Capita Personal Income**	**Percentage of Population Employed**	**Difference Between Regional and National Employment Ratio**	**Difference Between Regional and National Per Capita PI**
1983	$ 11,289.00	50.01%	0.37%	$ (1,329.00)
1984	$ 12,102.12	52.02%	0.68%	$ (1,267.47)
1985	$ 12,448.18	52.66%	0.33%	$ (1,267.43)
1986	$ 12,839.30	53.91%	1.03%	$ (1,250.11)
1987	$ 13,272.24	55.35%	1.53%	$ (1,023.53)
1988	$ 13,607.39	56.73%	1.72%	$ (1,042.65)
1989	$ 14,041.98	58.21%	2.62%	$ (893.51)
1990	$ 14,004.69	58.51%	2.67%	$ (897.37)
1991	$ 13,881.87	57.30%	2.51%	$ (723.13)
1992	$ 14,363.37	56.83%	2.58%	$ (500.49)
1993	$ 14,579.55	57.70%	3.15%	$ (192.77)
1994	$ 15,042.85	59.86%	4.67%	$ 81.98
1995	$ 15,432.21	60.58%	4.63%	$ 290.48
1996	$ 15,654.30	61.09%	4.61%	$ 246.39
1997	$ 15,942.00	62.14%	5.07%	$ 157.58
1998	$ 16,962.24	63.28%	5.42%	$ 469.60
1999	$ 17,121.60	63.41%	5.01%	$ 351.50
2000	$ 17,057.42	63.70%	4.61%	$ (275.34)
2001	$ 17,439.51	62.47%	3.93%	$ 202.35
2002	$ 17,632.43	61.79%	3.78%	$ 452.89

Table 4: Per Capita Personal Income and Employment Data for Baton Rouge, LA				
Year (Casino Operations Started in 1993)	Adjusted Per Capita Personal Income	Percentage of Population Employed	Difference Between Regional and National Employment Ratio	Difference Between Regional and National Per Capita PI
1983	$ 11,333.00	46.48%	-3.16%	$ (1,285.00)
1984	$ 11,676.30	47.91%	-3.43%	$ (1,693.29
1985	$ 11,784.31	47.72%	-4.62%	$ (1,931.30)
1986	$ 11,437.10	46.70%	-6.17%	$ (2,652.32)
1987	$ 11,318.51	47.51%	-6.31%	$ (2,977.27)
1988	$ 11,779.21	48.96%	-6.05%	$ (2,870.83)
1989	$ 12,282.30	49.95%	-5.63%	$ (2,653.18)
1990	$ 12,663.80	51.75%	-4.08%	$ (2,238.27)
1991	$ 12,798.34	52.32%	-2.47%	$ (1,806.65)
1992	$ 13,287.18	52.99%	-1.27%	$ (1,576.68)
1993	$ 13,114.35	53.29%	-1.26%	$ (1,657.97)
1994	$ 13,530.75	54.03%	-1.17%	$ (1,430.11)
1995	$ 13,597.32	55.23%	-0.72%	$ (1,544.42)
1996	$ 13,670.57	56.01%	-0.47%	$ (1,737.33)
1997	$ 13,712.56	55.97%	-1.10%	$ (2,071..87)
1998	$ 14,391.44	57.50%	-0.36%	$ (2,101.20)
1999	$ 14,401.85	58.41%	0.01%	$ (2,368.26)
2000	$ 14,548.44	59.16%	0.06%	$ (2,784.31)
2001	$ 14,676.80	57.95%	-0.60%	$ (2,560.36)
2002	$ 14,911.14	57.52%	-0.48%	$ (2,268.41)

Table 5: Per Capital Personal Income and Employment Date for New Orleans, LA				
Year (Casino Operations Started in 1993)	Adjusted Per Capita Personal Income	Percentage of Population Employed	Difference Between Regional and National Employment Ratio	Difference Between Regional and National Per Capita PI
1983	$ 12,404.00	50.52%	0.88%	$ (214.00)
1984	$ 12,825.63	51.64%	0.29%	$ (543.96)
1985	$ 12,894.49	50.89%	-1.44%	$ (821.12)
1986	$ 12,792.47	49.53%	-3.34%	$ (1,296.95)
1987	$ 12,697.51	49.60%	-4.22%	$ (1,598.27)
1988	$ 12,989.69	51.31%	-3.70%	$ (1,660.35)
1989	$ 13,320.99	52.16%	-3.42%	$ (1,614.50)
1990	$ 13,658.33	53.59%	-2.25%	$ (1,243.74)
1991	$ 13,674.94	53.55%	-1.24%	$ (930.05)
1992	$ 13,985.35	52.94%	-1.31%	$ (878.52)
1993	$ 14,035.51	53.46%	-1.09%	$ (736.81)
1994	$ 14,267.45	53.89%	-1.30%	$ (693.41)
1995	$ 14,495.97	55.07%	-0.88%	$ (645.75)
1996	$ 14,475.91	55.69%	-0.79%	$ (931.99)
1997	$ 14,885.91	56.68%	-0.39%	$ (898.51)
1998	$ 15,534.30	57.38%	-0.49%	$ (958.34)
1999	$ 15,379.63	57.68%	-0.72%	$ (1,390.48)
2000	$ 15,732.06	58.31%	-0.79%	$ (1,600.70)
2001	$ 16,378.14	58.50%	-0.04%	$ (859.01)
2002	$ 16,731.10	58.15%	0.15%	$ (448.44)

Table 6: Per Capita Personal Income and Employment Data for DesMoines, IA				
Year (Casino Operations Started in 1991)	Adjusted Per Capita Personal Income	Percentage of Population Employed	Difference Between Regional and National Employment Ratio	Difference Between Regional and National Per Capita PI
1983	$ 13,490.00	58.94%	9.30%	$ 872.00
1984	$ 14,145.75	60.78%	9.43%	$ 776.17
1985	$ 14,359.55	61.68%	9.35%	$ 643.94
1986	$ 14,813.89	62.23%	9.35%	$ 724.47
1987	$ 15,078.64	63.65%	9.83%	$ 782.87
1988	$ 15,342.81	65.32%	10.31%	$ 692.77
1989	$ 15,662.55	66.57%	10.99%	$ 727.07
1990	$ 15,936.42	68.01%	12.17%	$ 1,034.35
1991	$ 15,585.35	68.09%	13.30%	$ 980.35
1992	$ 15,919.18	68.00%	13.75%	$ 1,055.31
1993	$ 15,750.71	68.03%	13.49%	$ 978.40
1994	$ 16,226.39	68.99%	13.80%	$ 1,265.53
1995	$ 16,406.33	70.97%	15.02%	$ 1,264.60
1996	$ 16,668.63	71.68%	15.21%	$ 1,260.72
1997	$ 17,063.82	72.02%	14.95%	$ 1,279.39
1998	$ 17,869.43	73.09%	15.22%	$ 1,376.79
1999	$ 18,148.74	73.45%	15.05%	$ 1,378.63
2000	$ 18,325.01	73.60%	14.50%	$ 992.26
2001	$ 18,239.58	72.58%	14.04%	$ 1,002.43
2002	$ 18,491.14	71.62%	13.62%	$ 1,311.59

Table 7: Per Capita Personal Income and Employment Data for Gary, IN				
Year (Casino Operations Started in 1995)	Adjusted Per Capita Personal Income	Percentage of Population Employed	Difference Between Regional and National Employment Ratio	Difference Between Regional and National Per Capita PI
1983	$ 11,599.00	40.86%	-8.79%	$ (1,019.00)
1984	$ 11,913.29	41.17%	-10.18%	$ (1,456.29)
1985	$ 12,077.07	41.73%	-10.61%	$ (1,638.55)
1986	$ 12,149.09	41.71%	-11.17%	$ (1,940.33)
1987	$ 12,520.52	43.72%	-10.10%	$ (1,775.25)
1988	$ 12,951.26	45.67%	-9.34%	$ (1,698.78)
1989	$ 13,356.00	46.63%	-8.96%	$ (1,579.48)
1990	$ 13,251.33	47.51%	-8.33%	$ (1,650.74)
1991	$ 12,972.99	47.25%	-7.54%	$ (1,632.000)
1992	$ 13,276.40	46.67%	-7.58%	$ (1,587.46)
1993	$ 13,414.03	46.94%	-7.61%	$ (1,358.29)
1994	$ 13,845.90	47.57%	-7.62%	$ (1,114.97)
1995	$ 13,974.56	47.82%	-8.13%	$ (1,157.17)
1996	$ 14,388.18	48.58%	-7.90%	$ (1,019.72)
1997	$ 14,622.14	49.42%	-7.65%	$ (1,152.28)
1998	$ 15,116.97	49.92%	-7.95%	$ (1,375.67)
1999	$ 15,328.98	50.27%	-8.13%	$ (1,441.13)
2000	$ 15,635.79	49.82%	-9.28%	$ (1,696.96)
2001	$ 15,384.74	49.14%	-9.41%	$ (1,852.41)
2002	$ 15,177.15	48.17%	-9.83%	$ (2,002.39)

Table 8: Per Capita Personal Income and Employment Data for Detroit, MI				
Year (Casino Operations Started in 1999)	Adjusted Per Capita Personal Income	Percentage of Population Employed	Difference Between Regional and National Employment Ratio	Difference Between Regional and National Per Capita PI
1983	$ 13,510.00	43.16%	-6.48%	$ 892.00
1984	$ 14,601.74	45.60%	-5.75%	$ 1,232.16
1985	$ 15,452.25	48.25%	-4.08%	$ 1,736.63
1986	$ 16,126.50	49.29%	-3.58%	$ 2,037.08
1987	$ 16,028.65	50.30%	-3.52%	$ 1,732.87
1988	$ 16,497.85	51.58%	-3.43%	$ 1,847.80
1989	$ 16,784.96	52.95%	-2.64%	$ 1,849.47
1990	$ 16,592.53	53.22%	-2.62%	$ 1,690.47
1991	$ 16,184.07	51.29%	-3.50%	$ 1,579.08
1992	$ 16,656.36	50.88%	-3.37%	$ 1,792.50
1993	$ 16,861.75	51.20%	-3.35%	$ 2,089.43
1994	$ 17,515.28	52.57%	-2.63%	$ 2,554.41
1995	$ 17,631.90	53.53%	-2.42%	$ 2,490.17
1996	$ 17,815.08	54.34%	-2.14%	$ 2,407.18
1997	$ 18,163.79	54.99%	-2.09%	$ 2,379.36
1998	$ 19,152.69	55.82%	-2.05%	$ 2,660.05
1999	$ 19,519.83	56.86%	-1.54%	$ 2,749.72
2000	$ 20,051.83	58.04%	-1.06%	$ 2,719.07
2001	$ 19,445.53	56.69%	-1.86%	$ 2,208.37
2002	$ 19,077.14	55.82%	-2.18%	$ 1,897.59

Table 9: Per Capita Personal Income and Employment Data for Chicago, IL				
Year (Casino Operations Started in 1991)	Adjusted Per Capita Personal Income	Percentage of Population Employed	Difference Between Regional and National Employment Ratio	Difference Between Regional and National Per Capita PI
1983	$ 14,306.00	49.63%	-0.01%	$ 1,688.00
1984	$ 15,115.61	51.48%	0.13%	$ 1,746.02
1985	$ 15,358.40	52.21%	-0.12%	$ 1,642.79
1986	$ 15,834.55	53.31%	0.43%	$ 1,745.13
1987	$ 16,166.81	54.86%	1.04%	$ 1,871.04
1988	$ 16,838.66	56.39%	1.38%	$ 1,188.61
1989	$ 16,895.20	57.22%	1.63%	$ 1,959.72
1990	$ 16,983.30	57.78%	1.94%	$ 2,081.23
1991	$ 16,621.17	56.74%	1.95%	$ 2,016.18
1992	$ 17,062.37	55.73%	1.48%	$ 2,198.50
1993	$ 16,896.84	55.99%	1.45%	$ 2,124.52
1994	$ 17,226.78	56.74%	1.55%	$ 2,265.92
1995	$ 17,612.52	57.69%	1.74%	$ 2,470.79
1996	$ 17,976.49	58.05%	1.57%	$ 2,568.59
1997	$ 18,332.71	58.48%	1.41%	$ 2,548.29
1998	$ 19,070.91	59.37%	1.50%	$ 2,578.27
1999	$ 19,288.60	59.67%	1.27%	$ 2,518.49
2000	$ 19,955.70	60.25%	1.15%	$ 2,622.94
2001	$ 19,736.40	59.47%	0.92%	$ 2,499.25
2002	$ 19,508.83	58.49%	0.49%	$ 2,329.29

To test the impact of the income and employment, we develop two main null hypotheses. The first set of null hypotheses is that the difference of regional and national per capita personal income for each region after casino is more than difference of regional and national per capita personal income before casino for each

region. The second set of null hypotheses deals with employment. The set of null hypotheses is that the difference of regional and national employment ratio after casino is more than difference of regional and national per capita personal income before casino for each region. To test the hypotheses, two-sample t-tests were performed assuming that data before casinos as sample 1 and after casinos as sample 2. All the hypotheses were tested at an error level of 1%. The results of these tests are summarized in the Tables 10-11.

Table 10: t-test Difference of Regional and National Per Capita PI

	Pre Casino Average	Post Casino Average	Significance of One-tail t-Test (Alpha .01)
Des Moines	$ 781.70	$ 1,178.83	Yes
Detroit	$ 1,935.67	$ 2,2393.69	No (sig. at .05)
Chicago	$ 1,865.32	$ 2,395.09	Yes
Gary	$(1,537.59)	$ (1,464.72)	No
Gulfport	$ (3,715.09)	$(3,350.06	No (sig. at .05)
Tunica--Memphis	$ (1,077.13)	$ 116.74	Yes
Baton Rouge	$ (2,168.48)	$ (2,052.42)	No
New Orleans	$ (1,080.14)	$ (916.34)	No

DISCUSSION

In all MSAs and CSAs included, in this study, show that employment as well per capita personal income scenario has improved after casino gambling has started. That is, regional per capita personal income and employment have improved compared to national per capita personal income and employment after casino industry has arrived in the region. However the impact of the casino industry is not even specially when measuring per capita personal income of different regions.

The Table 10 shows that a statistically significant (error level 1%) improvement has been made in the per capita personal income of Chicago, Des Moines, Tunica (Memphis) after casino business started there. In Detroit and Gulfport area improvement was significant at 5% level, whereas there was no

statistical difference in the per capita personal income of Baton Rouge, New Orleans and Gary regions. The post casino data of Detroit area is relatively small (four data points) as casino started in this area in 1999. Every other area showing no significant improvement has one common characteristic, i.e., each of these areas had substantially lower per capita personal income compared with national level before casino industry came in the region with an exception of Tunica (Memphis.) The Tunica area's per capita personal income include large section of MSA which is in the state (Tennessee) where there is no casino gambling.

Table 11: t-test Difference of Regional and National Employment Ratio

	Pre Casino Average	Post Casino Average	Significance of One-tail t-Test (Alpha 1%)
Des Moines	10.09%	14.33%	Yes
Detroit	-3.35%	-1.66%	Yes
Chicago	0.80%	1.37%	Yes
Gary	-8.99%	-8.53%	No
Gulfport	-4.01%	1.54%	Yes
Tunica--Memphis	1.50%	4.31%	Yes
Baton Rouge	-4.32%	-0.61%	Yes
New Orleans	-1.98%	-0.64%	Yes

From above interpretation, one can conclude that if a region is significantly behind the national per capita personal income before that casino industry is authorized in the region then the improvement in the personal income is not going to be significant by bringing gambling industry. However, if a region is better in the personal income than the national level then the casino industry is likely to have a significant positive impact on the personal income of the area.

The Table 11 shows that employment ratio in every region has shown a statistically significantly improvement after gaming is authorized in the region with an exception of Gary, IN. Even in Gary, the employment ratio has improved somewhat but not enough to show a statistically significant improvement. There could be other factors in the Gary, IN for insignificant change in the employment

ratio. This is one of the two regions, other being the New Orleans, where population the 1983-2002 has increased by less than 5%. Total increase in population of Gary in twenty year is 2%. Most of the MSA/CSAs studied here have shown increases in the population between 8%-20%. This extremely slow growth in the population may indicate that more working age group of population is moving out the Gary, IN and leaving behind large section of retired or retrenched workers and their dependents from older auto ancillary industry. This area probably has some other major factors impacting its employment scenario.

CONCLUSIONS

Both employment and per capita personal income show an increase after casino industry is introduced in a given region. In general, regional employment ratio compared with the national employment improves after casino industry is introduced. The regional per capita personal income compared with national per capita personal income gets significantly better after casino industry is introduced if the region was doing better than the national average before the casino industry came into the region.

The regional per capita personal income compared with national per capita personal income does not improve significantly after casino industry is introduced if region was doing worse than the national average before the casino industry came into the region.

The casino industry improves employment but not income in the areas, which were significantly behind the national per capita personal income. This means, that in these economically deficient regions, casino industry brings lower paying jobs. This shows better employment but poor personal income. Same conclusion could not be made for the regions, which have significantly better per capita income levels before casinos were introduced in the area.

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COMMUNITY REINVESTMENT ACT AND EFFICIENT MARKETS DEBATE: OVERVIEW

Kavous Ardalan, Marist College
Ann Davis, Marist College

ABSTRACT

This paper integrates two existing lines of research. On the one hand, there is the literature on the community reinvestment act (CRA), and on the other there is the literature on the efficient markets hypothesis (EMH). The paper first provides an overview of each line of research, and then discusses how they might be related. A major portion of the paper is devoted to the introduction of the CRA, its relation to the relevant laws, its development over time. The paper reviews the phases of the CRA and the major factors which have contributed to its wide-ranging effects. Since the EMH is a relatively well-known topic, the paper briefly re-introduces the issues involved. Finally, the paper discusses what the implications of the CRA might be for the EMH.

INTRODUCTION

This paper integrates two existing lines of research. On the one hand, there is the literature on the community reinvestment act (CRA), and on the other there is the literature on the efficient markets hypothesis (EMH). The paper first provides an overview of each line of research, and then discusses how they might be related. A major portion of the paper is devoted to the introduction of the CRA, its relation to the relevant laws, its development over time. The paper reviews the phases of the CRA and the major factors which have contributed to its wide-ranging effects. Since the EMH is a relatively well-known topic, the paper briefly re-introduces the issues involved. Finally, the paper discusses what the implications of the CRA might be for the EMH. This paper sets the foundation for two other papers dealing with the theoretical debate and empirical evidence on the Community Reinvestment Act (Ardalan 2006a and 2006b).

COMMUNITY REINVESTMENT ACT AND RELATED LAWS

The Community Reinvestment Act (CRA) was enacted in 1977 based on the concern that commercial banks and savings associations were engaging in "redlining" practices that were accelerating the decline of many inner-city urban areas. Redlining referred to the practice whereby depository institutions literally or figuratively drew a red line around certain neighborhoods on the basis of the racial composition, age of housing stock, or other factors regardless of the creditworthiness of individual loan applicants, and declined to make loans in those neighborhoods. The perception was that these practices were resulting in the disinvestment and decline of many older, central city, and typically low-income and minority neighborhoods and a shift of jobs to suburban areas. The CRA addressed this problem by requiring the banking regulators to encourage the institutions to help meet the credit needs of the communities in which they are chartered to do business. The hope was that by encouraging depository institutions to look for profitable lending opportunities in their local communities, the CRA would be helpful in revitalizing inner-cities at a time when investment was moving to distant money centers or to more affluent and outlying communities.

The extant literature reveals the following two trends. First, home mortgage lending to low- and moderate-income and minority neighborhoods during the 1990s has increased at rates that far exceed the increases in lending to other neighborhoods. These increases have been attributed in part to the influence of the CRA and fair lending laws.

Second, the CRA has helped create a community development infrastructure among the banking industry, the bank regulatory agencies, the secondary market organizations, and in inner-city communities that has increased CRA compliance. The CRA has increased collaboration among bankers, local and state governments, and community-based organizations in arrangements such as loan consortia and public/private enterprise partnerships. Further, the CRA has resulted in the creation of financial instruments designed to make the private capital more accessible to low- and moderate-income borrowers and minority neighborhood, be represented by banks as CRA commitments, and bring CRA activities into the financial mainstream.

The principle underlying the CRA, that depository institutions must serve the "convenience and needs" of the communities in which they are chartered to do business consistent with safe and sound operations, is one that federal law governing deposit insurance, bank charters, and bank mergers had included before the CRA

was enacted. The Banking Act of 1935 states that banks should serve the convenience and needs of their communities. The Bank Holding Company Act of 1956 requires the Federal Reserve Board (FRB), in deciding on acquisitions by banks and bank holding companies, to assess how well a bank meets the convenience and needs of its communities consistent with safe and sound operations. Under CRA, the concept of "convenience and needs" includes the extensions of credit.

CRA and the fair lending laws, while separate, have related objectives. The primary purpose of CRA was to prohibit redlining. The Fair Housing Act (FHA) and the Equal Credit Opportunity Act (ECOA) prohibit lending discrimination based on certain characteristics of potential and actual borrowers. The FHA, enacted as title VIII of the Civil Rights Act of 1968, prohibits discrimination in residential real estate-related transactions on the basis of an applicant's race, color, religion, gender, handicap, familial status, or national origin. These actions include denying a loan or fixing the terms and conditions of a loan based on discriminatory criteria. The ECOA, enacted in 1974, prohibits discrimination with respect to any aspect of a credit transaction based on race, color, religion, national origin, gender, marital status, age, receipt of public assistance, or the exercise, in good faith, of rights granted by the Consumer Credit Protection Act.

The Home Mortgage Disclosure Act (HMDA) was enacted in 1975 to establish a reporting obligation for depository institutions in order for regulators and the public could determine whether depository institutions were serving the credit needs of their communities. It required depository institutions with total assets of more than $10 million to compile data on the number and total dollar amount of mortgage loans originated or for which the institution received completed applications or purchased during each fiscal year by geographic area and make that data available for public inspection. In 1989, HMDA was amended to require collection and reporting of data on race, gender, and income characteristics of mortgage applicants to help identifying discriminatory lending practices and enforcing fair lending laws. Amendments to HMDA in 1988 and 1991 expanded the reporting requirements to most mortgage banking subsidiaries of banks and thrift holding companies and independent mortgage companies not affiliated with depository institutions. In 1992, HMDA was amended to require the financial institutions to make available to the public, upon request, their loan application registers, which contain data for loans covered by HMDA.

HMDA is a large data source at the individual loan application level. Among data sources, it provides the best opportunity to analyze lending patterns and

trends by borrower income, race/ethnicity or gender in such detail. Furthermore, the loan data are geo-coded to census tracts, allowing the analysis of the impact of CRA on lending in lower-income, minority, or other historically underserved neighborhoods.

Both HMDA and CRA were enacted to address the regulators' perceived lack of lending by banking institutions to the communities in which they were chartered to do business. Where available, HMDA data are to be used by examiners when assessing compliance with CRA, FHA, and ECOA.

Garwood and Smith (1993), and Litan, Retsinas, Belsky, and White Haag (2000) have discussed aspects of the CRA. The present study has extensively benefited from Belsky, Lambert, and von Hoffman (2000), Ford Foundation (2002), General Accounting Office (1995), and White Haag (2000),

DEVELOPMENT OF THE COMMUNITY REINVESTMENT ACT

Concerns that banks and savings institutions did not adequately respond to credit needs of the communities they served prompted the passage of title VIII of the Community Reinvestment Act (CRA) of 1977. The act mandates federal bank and thrift regulators – the Comptroller of the Currency (OCC) for federal banks; the Board of Governors of the Federal Reserve System (FRB) for State-chartered banks that are members of the Federal Reserve System and bank holding companies; the Federal Deposit Insurance Corporation (FDIC) for state-chartered banks and savings banks that are not members of the Federal Reserve System and the deposits of which are insured by the FDIC; and the Office of Thrift Supervision (OTS) for savings associations with deposits insured by the FDIC, and savings association holding companies, to use their authority to encourage institutions to help meet the credit needs in all areas of the community the institution is chartered to serve, consistent with safe and sound operations. CRA does not cover credit unions and independent mortgage companies. According to the CRA the federal banking regulators have the primary responsibility for the examination of CRA performance and enforcement of the act.

The act requires the regulators to periodically assess institutions' community lending performance and to take it into account when evaluating an institution's application for a deposit facility. Where an "application for deposit facility" is defined as an application to the appropriate supervising regulator for (1) a charter for a national bank or federal savings and loan (S&L); (2) deposit insurance in connection with a newly chartered bank, savings bank, S&L, or similar

institution; (3) the opening of a domestic branch or other facility with the ability to accept insured bank or S&L deposits; (4) the relocation of a home office or branch; (5) the merger or consolidation with, or acquisition of the assets, or assumption of the liabilities of an insured depository institution; or (6) the acquisition of shares or assets of an insured depository institution requiring approval under the Bank Holding Company Act or the National Housing Act.

Growing concern about the effectiveness of CRA's implementation and its regulatory burden on institutions led to a few revisions, and a final revision in May 1995.

CRA was amended by the Financial Institution Reform, Recovery, and Enforcement Act of 1989 (FIRREA) to require that the regulator's examination rating and a written evaluation of each assessment factor be made publicly available. FIRREA also established a four-point qualitative rating scale so that the CRA ratings would be different from the five-point numerical ratings assigned based on the safety and soundness examinations.

The Federal Deposit Insurance Corporation Improvement Act of 1991 (FDICIA) amended CRA to require public discussion of data underlying the regulators' assessment.

The Housing and Community Development Act of 1992 amended CRA to require that the regulators give CRA credit to institutions who cooperate in activities and investment involving minorities- and women-owned financial institutions and low-income credit unions.

The Riegle-Neal Interstate Banking and Branching Efficiency Act of 1994 amended CRA to require that depository institutions with interstate branching be assigned a separate rating and evaluation for each state and a separate evaluation where they have branches in two or more states within their metropolitan area.

According to the pre-1995 version of the CRA, an examiner is to evaluate depository institutions' technical compliance with a set of specific rules, and to qualitatively evaluate the institution's efforts and performance in serving the credit needs of its entire community. In assessing compliance with the technical requirements of CRA the examiner works through the CRA checklist. However, assessing compliance with the qualitative requirements of CRA is more difficult and subjective. The qualitative aspect of an institution's performance is to be assessed according to 12 factors. To allow examiner sufficient flexibility the regulators have not assigned a relative weighing to the factors. However, regulators have stated that compliance with antidiscrimination laws and regulations, including ECOA and FHA, is a significant factor in determining the CRA rating. Moreover, regulators

have stated that examiners are to weigh CRA performance over process, i.e., how well an institution helps meet the credit needs of its community over documentation showing how the institution ensures CRA compliance.

The CRA assessment factors are grouped under five performance categories as published in the Federal Register on May 1, 1990. Table 1 shows the categories and their corresponding factors.

A compliance examination generally results as well in a CRA rating. The CRA scale is a four-part descriptive scale as follows: "outstanding," "satisfactory," "needs to improve," and "substantial noncompliance."

FRB and FDIC also approve applications with commitments. OCC and OTS do not do so, instead they conditionally approve applications. The conditions may be similar to commitments; however, the depository institution must meet the conditions before the final approval.

Table 1: CRA Assessment Factors
Performance categories and related assessment factors

1. Ascertainment of community credit needs
Assessment factor A: Activities to ascertain credit needs and efforts to communicate with the community, including the extent of the institution's efforts to communicate with members of its community regarding the credit services being provided by the institution.
Assessment factor C: The extent of participation by the institution's board of directors in formulating the institution's policies and reviewing its performance related to CRA.
2. Marketing and types of credit offered and extended
Assessment factor B: The extent of the institution's marketing and special credit-related programs to make members of the community aware of the credit services offered by the institution.
Assessment factor I: The institution's origination of residential mortgage loans, housing rehabilitation loans, home improvement loans, and small business or small farm loans within its community, or the purchase of such loans originated in its community.
Assessment factor J: The institution's participation in governmentally insured guaranteed or subsidized loan programs for housing, small business, or small farms.

Table 1: CRA Assessment Factors Performance categories and related assessment factors
3. Geographical distribution and record of opening and closing offices
Assessment factor E: The geographic distribution of the institution's credit extensions credit applications, and credit denials.
Assessment factor G: The institution's record of opening and closing offices and providing services at offices.
4. Discrimination and other illegal credit practices
Assessment factor D: Any practices intended discourage applications for types of credit set forth in the institution's CRA Statement(s).
Assessment factor F: Evidence of prohibited discriminatory or other illegal credit practices.
5. Community development
Assessment factor H: The institution's participation, including investment, in local community development and redevelopment projects or programs.
Assessment factor K: The institution's ability to meet various community credit needs based on its financial condition and size, legal impediments, local economic conditions, and other factors.
Assessment factor L: Any other factors that, in the regulatory authority's judgment, reasonably bear upon the extent to which an institution is helping to meet the credit needs of its entire community.
Source: FRB, FDIC, OCC, and OTS compliance manuals.

Any depository institution wishing to expand must be prepared for the potential for a protest by community groups or other members of the public. Regulators must consider protests in their approval process. Historically, these protest groups have exercised their right over institutions wishing to expand. Regulators encourage the parties at odds to come together before an application is submitted to a regulator for approval. The amendments to CRA enacted by FIRREA in 1989 and FDICIA in 1991 have strengthened the public role in enforcing CRA in both the application review process and the CRA examination process.

Many community groups voiced their concern that although over 90 percent of all depository institutions receive satisfactory CRA rating or above, there are large geographic areas that do not obtain credit from these institutions. These groups

demanded an examination process that is based on actual lending "performance" rather than "process." On July 15, 1993, the President called for a revision to the CRA regulation that would make CRA examination a performance-based system based on results rather than process and paperwork. Especial emphasis was placed on results in low- and moderate-income areas of depository institutions' communities.

In May 1995, FRB, OCC, OTS, and FDIC released the revised CRA regulations which had a more quantitative orientation and was based on actual performance relative to the following three tests: the lending test, the service test, and the investment test. These replaced the qualitative CRA examination system, including the 12 assessment factors. The three tests under the revised CRA regulations are described as follows:

> *Lending test:* The lending test is the examination of an institution's lending record, including originations and purchases of home mortgages, lending to small businesses and small farms, and, at the institution's option, consumer loans throughout the institution's service area, including the low- and moderate-income areas; the distribution of loans to borrowers in its service area(s); the distribution of loans to borrowers of various income levels; and the like.
>
> *Investment test:* The investment test is the examination of an institution's investments in community development activities. The examiner takes into account the amount, innovativeness, or complexity of the investment as well as the degree to which it responds to community credit and economic development needs.
>
> *Service test:* The service test is the examination of an institution's systems for delivering retail banking services and the extent and innovativeness of its community development services. The examiner reviews information regarding branching, alternative service delivery mechanisms such as banking by telephone, mobile branches, loan production offices, automated teller machines (ATM), etc., in low- and moderate-income areas and for low- and moderate-income individuals. The focus of the test, however, is on the institution's current distribution of full-service branches.

In general, the regulators rate an institution's performance with respect to each of the three tests, but the lending test rating carries more weight than the other two. An institution must receive at least "low satisfactory" rating on the lending test to receive an overall CRA rating of satisfactory. However, ratings on the other two tests have considerable effect on the overall rating.

The revised regulation allows a streamlined examination for small institutions. A small institution is defined as an independent retail institution with total assets of less than $250 million and holding company affiliates with total assets of less than $1 billion. The streamlined examination method focuses on an institution's loan-to-deposit ratio, degree of local lending, record of lending to borrowers and the geographic distribution of different income levels, and record of responding to complaints.

The revised regulation also gives all depository institutions the option of having their CRA performance examined according to a regulator-approved strategic plan. The strategic plan should be developed with community input detailing how the institution proposes to meet its CRA obligation.

The most recent changes to CRA occurred as a result of the Gramm-Leach-Bliley Financial Modernization Act (GLBA) of 1999. GLBA requires that depository institutions must have satisfactory CRA ratings before the institution, or its holding company, affiliates or subsidiaries, can engage in any of the expanded financial activities permitted under the law. GLBA's "sunshine" provision requires that agreements entered into by depository institutions and community organizations or other entities in fulfillment of CRA obligations must be publicly disclosed.

EFFECTS OF THE COMMUNITY REINVESTMENT ACT

The CRA, which was passed in 1977, had limited effect on lending until the late 1980s when the amount of such lending increased significantly (Evanoff and Siegal 1996).

To understand the reasons for this increase and determine the impact of the CRA on lending in low- and moderate-income neighborhoods, during the first half of 2000 the Joint Center for Housing Studies of Harvard University convened a series of discussion groups comprised of individuals who have studied or have direct knowledge of lending in low- and moderate-income neighborhoods. This was then reflected in Belsky, Lambert, and von Hoffman (2000), a summary of which is as follows.

After the passage of the CRA depository institutions made few loans in low- and moderate-income neighborhoods. Regulators enforced the CRA inconsistently. Depository institutions were not worried about receiving CRA approval because almost all of them passed their CRA exams. A major progress started when a few banks and mortgage consortia began to organize departments and assign staff to carry out low- and moderate-income lending, setting the stage for future activity.

In the 1990s, depository institutions substantially increased the amount of loans extended to low- and moderate-income borrowers and neighborhoods. By the late 1990s, regulators had created more consistent and rigorous examination processes. Depository institutions took the regulatory examinations more seriously, worked harder to improve their CRA performance, and expanded their community reinvestment operations. Depository institutions introduced new methods of mortgage lending and offered novel loan products to the low- and moderate-income market. Depository institutions and community advocates began to work together as partners. In general, regulatory officials, community advocates, and officers of a significant number of depository institutions took the CRA seriously and acted together to fulfill its goals.

Several factors that emerged in the late 1980s led lending institutions to increase their lending in low- and moderate-income communities. These factors fall into three categories: (1) collection of new mortgage data; (2) enforcement of CRA; and (3) changes in mortgage market.

Collection of New Mortgage Data: The Financial Institution Reform and Recovery Act (FIRREA) required financial institutions to collect and report information about loan applications and borrowers, including their race, sex, and income. FIRREA also required government officials to release expanded HMDA data and the CRA ratings to the public.

Accordingly, during the early 1990s, the Federal Reserve Board started to release aggregated HMDA data. Consultants and financial institutions then began to disseminate the data in computerized formats, which make the data widely accessible.

Community groups and the local news media analyzed the HMDA race and loan data and concluded that there were discriminatory lending patterns in certain communities.

In 1988 and 1989 the Atlanta Journal-Constitution published "The Color of Money," a series of reports by reporter Bill Dedman that described lending in the Atlanta region as favoring whites over blacks. This series, which won a Pulitzer Prize in journalism, prompted community organizations to protest, increased media

coverage of racial discrimination in lending, and led depository institutions to increase the number of loans to African-Americans and other minority groups.

Another highly publicized study by Munnell et al. (1992), Mortgage Lending in Boston: Interpreting HMDA Data, issued by the Federal Reserve Bank of Boston, had a similar impact. The study found that the rate of denial of loan applications for blacks was much higher than for whites with similar qualifications.

Depository institutions were afraid that criticism on racial grounds would hurt their standing in the community and their ability to expand their operations. These institutions began to analyze the new HMDA data in order to set lending targets for the number and location of their community loans. Depository institutions used this information to size up themselves against competitors regarding penetration into the low- and moderate-income lending market and formulated strategies for expanding the number of customers for CRA-type loans.

Enforcement of CRA: In the late 1980s, federal government officials stepped up their oversight of the CRA thereby pressuring depository institutions to increase the number of loans to low- and moderate-income borrowers and neighborhoods.

In 1989 the Board of Governors of Federal Reserve Bank denied a merger application by the Continental Illinois National Bank and Trust Company of Chicago on the grounds that the bank had not met its CRA requirements. This was the first time that regulators had denied a depository institution's merger application because of non-compliance with the CRA.

As a result, depository institutions worried that federal regulators would deny merger applications unless they complied with the CRA. Therefore, depository institutions' consolidation and merger strategy had an enormous impact on CRA lending. In contrast, for those institutions who were not interested in merger, there was little or no competition for CRA type lending.

In 1989 again, the U.S. Department of Justice sued the Decatur Federal Savings and Loan Association of Atlanta for violating the fair lending laws (mostly the Fair Housing Act and the Equal Credit Opportunity Act). In 1992, Decatur agreed to pay $1 million in damages for discriminatory lending practices and improve its lending practices.

Consequently, depository institutions interpreted the Decatur law-suit as the federal banking regulators' tough new policy in the area of fair lending. As a result, depository institutions became more aggressive in approving low- and moderate-income loan applications.

Over the years, the Congress pushed federal officials to tighten their regulation of the CRA. In response, regulators systematized and increased their

supervision of low- and moderate-income lending. In 1989, for the first time regulators released to specific depository institutions the detailed results of the CRA examination with respect to the twelve standard assessment factors. In 1991, regulators started the public release of the results of their examinations of depository institutions' compliance with the CRA. After this, they enforced the act more strictly.

In 1995 and 1996, regulators adopted new ways to examine the lending practices of depository institutions. Examinations were now dependent on the size of the depository institution. For larger banks, the examination was based on three tests: lending, investment, and service. Each test measured innovation and access to financial products. Depository institutions were also now required to disclose their loans outside metropolitan areas. The depository institutions then responded by setting lending goals in order to earn high grades on CRA examinations.

Changes in Mortgage Market: The banking and mortgage industries underwent some changes which encouraged depository institutions to increase their loans to low- and moderate-income borrowers and neighborhoods.

The savings and loan crisis of the late 1980s indirectly played a role because depository institutions had an incentive to merge. This is because, after many savings and loans associations closed, larger institutions hoped to survive by merging with other institutions. The Reigle-Neal law facilitated this process because it eased restrictions on interstate banking. But as described above, when depository institutions applied for merger, regulators enforced the CRA, by which they required depository institutions to have extended enough CRA loans.

The expansion of secondary mortgage market also helped increase the low- and moderate-income lending. Two government-sponsored mortgage corporations, Freddie Mac and Fannie Mae, are major purchasers in the secondary mortgage market. In 1992, in conformance with the recently passed Federal Housing Enterprises Financial Soundness and Safety Act, Freddie Mac and Fannie Mae started to increase their purchases of mortgages to low- and moderate-income borrowers, borrowers in underserved areas, and borrowers for affordable housing projects. This encouraged depository institutions to increase their volume of loan to low- and moderate-income borrowers and neighborhoods which they could then sell to Fannie Mae and Freddie Mac. Such sale of the mortgages freed depository institutions' capital to make more loans to low- and moderate-income borrowers. Nonetheless Fannie Mae and Freddie Mac do not purchase CRA loans as below-market-rate mortgages, requiring the lending institutions to hold them in their portfolios.

The mergers in the banking industry resulted in larger lending institutions that had greater ability to extend CRA loans. These larger banks benefited from economies of scale and specialized in certain markets. Therefore, during the 1990s, these larger banks had more funds to lend to people in low- and moderate-income communities. Although these larger banks have more funds than previous smaller institutions, they may be less responsive to the needs of their communities and they may be less likely to meet their responsibilities in certain communities due to their larger size.

In issuing mortgages to low- and moderate-income borrowers, depository institutions gained experience and became more efficient in issuing CRA loans. Depository institutions were able to lower the costs of issuing CRA mortgages by improving their mortgage originations process and using improved technologies in their operations. Depository institutions learned more about the low- and moderate-income market and how to more accurately assess the risks of potential loans and reduce their own risk of default. Depository institutions took advantage of the insurance provided by private companies when they were extending loans to low- and moderate-income borrowers, which usually are loans with higher loan to value (LTV) and debt to income ratios.

The profitability of CRA loans was regarded as another contributing factor. Depository institutions over time realized that mortgage lending to low- and moderate-income borrowers and neighborhoods could be profitable. At first, depository institutions thought that CRA loans with high LTV, that require extra effort compared to other loans, are not profitable. However, the original assumptions proved to be untrue. Several factors, including the CRA, originally inspired depository institutions to lend in low- and moderate-income areas, but it was the profitability of the loans that induced lenders to continue making them. That is, depository institutions were convinced that there were untapped market opportunities in low- and moderate-income lending. However, some CRA loans are more costly and more risky to the depository institution and hence less profitable.

Finally, the favorable conditions in the national economy encouraged depository institutions to increase the number and amount of loans in low- and moderate-income neighborhoods. The large profits earned in the booming economy made it possible for depository institutions to accept riskier loans and lower interest rates on mortgages.

EFFICIENT MARKETS DEBATE

The debate is based on three major different perspectives: (1) The lending market is efficient, (2) The lending market is inefficient due to illegal "discrimination," and (3) The lending market is socially inefficient as caused by "externalities." The efficient markets view regards the CRA as a "tax" on the banking system, whereas the latter two views mostly support the idea that the CRA benefits lenders as well as low- and moderate-income borrowers and their neighborhoods.

The Efficient Markets Hypothesis (EMH) states that market prices reflect all available information. According to what type of information is available and, therefore, incorporated into market prices, there are three levels of market efficiency:

> *Weak form efficiency* states that all information contained in past price movements is contained in current market prices.
> *Semi-Strong form efficiency* states that current market prices reflect all publicly available information.
> *Strong form efficiency* states that current market prices reflect all pertinent information, whether publicly available or privately held. A good source of information on the EMH is Shiller (2002) and the references therein.

According to the efficient markets view, as long as mortgage credit is extended in a competitive manner the market is best suited to determine which lenders and how many are needed to serve the borrowers.

In the efficient markets view, depository institutions have private incentive to seek all profitable lending opportunities; therefore CRA should have little effect on lending because depository institutions already perform the tasks that the CRA intends to encourage them to do. However, if the CRA forces lenders to make unprofitable loans, then the efficient markets view would regard the CRA as a burden on the banking system. For instance, the CRA may impose substantial compliance costs, such as the costs of training staff to become familiar with the requirements of the CRA and the costs of maintaining records of actions taken to comply with the regulation to be shown to regulators.

The competing views, in turn, note that the CRA itself established and helped maintain the conditions that enabled independent mortgage companies to succeed in reaching low- and moderate-income borrowers and neighborhoods. The CRA accomplished this first by demonstrating that market opportunities existed in serving

previously neglected low- and moderate-income borrowers and neighborhoods, and second by enforcing ongoing credit access in low- and moderate-income neighborhoods ensuring that housing markets in these areas remain viable.

The competing views note that as the mortgage lending to low- and moderate-income borrowers and neighborhoods has become more prevalent and more competitive, many lenders introduced products for the CRA-eligible market and used them on a regular basis. Thus, while their CRA lending is mostly extended in their assessment areas, introduction of new products to better serve these areas have likely had positive spillover effects on lending outside of assessment areas, as well as on the lending of non-CRA regulated companies. The fact that many large independent non-CRA mortgage companies have been successful at serving the low- and moderate-income market is an evidence of this process and that a reasonable portion of the CRA-eligible market is being served economically.

The debate preceding the enactment of CRA has continued to this date. The evidence on efficient markets in bank lending seems inconclusive. The controversy will continue for the foreseeable future. An observer with a strong prior belief in the ability of market forces to take advantage of profitable opportunities can easily remain unconvinced by the evidence on the effects of the CRA. On the other hand, an observer with a strong prior belief in the prevalence of market failures in lending will find striking confirmation in such evidence. Between these two extremes lie a range of reasonable assessments.

PREDATORY LENDING

Lately, lending institutions have expanded their operations in the fast-growing area of sub-prime lending. However, many of the companies engaged in this market are not subject to CRA regulations.

HUD-Treasury (2000) reports that recently, too many families are suffering because of the growth of predatory or abusive practices. These practices are concentrated in the sub-prime mortgage market, where most borrowers use the collateral in their homes for debt consolidation or other consumer credit purposes. The interest rates on sub-prime loans are usually higher than that of conventional loans because banks assume that customers run a higher risk of defaulting on their mortgages. This type of lending was and is profitable although it carries higher risks than the prime lending market. Most borrowers in this market have limited access to the mainstream financial sector, yet some would likely qualify for prime loans. Sub-prime lending serves an important role, by providing loans to borrowers who do not meet the credit standards for the prime

mortgage market (e.g., impaired or limited credit histories, or high debt relative to their income). Predatory lending practices occur at any stage of the loan process, lenders, mortgage brokers, realtors, and home improvement contractors. In a predatory lending situation, the party that initiates the loan often engages in deception or fraud, provides misinformation, manipulates the borrower through aggressive sales tactics, and/or takes unfair advantage of the borrower's lack of information about the loan terms and their consequences. The results are loans with onerous terms that, alone or in combination, are abusive or make the borrower more vulnerable to abusive practices. The existence of these practices is especially troubling to the extent that sub-prime lending is most heavily concentrated in lower-income and predominantly minority neighborhoods. Predatory lending has contributed to the rapid growth in foreclosures in many inner-city communities, and foreclosures can destabilize families and entire neighborhoods. As a result, the issue of sub-prime and predatory lending are closely intertwined with obligations under the CRA.

Predatory lending in the prime market is avoided by competition among lenders, greater homogeneity in loan terms, greater financial information among borrowers, and the fact that most prime lenders are banks, thrifts, or credit unions, which are subject to extensive federal and state oversight and supervision. This is in sharp contrast to the sub-prime market.

CONCLUSION

CRA was passed in 1977 and has undergone several revisions. Overall, it has increased lending to low- and moderate-income borrowers and communities. The CRA has also made significant changes in the behavior of many federally regulated financial institutions and the financial industry. They have been testing new financial instruments to reach low- and moderate-income markets. They have created bank consortia.

This paper has reviewed the CRA and related legislation, summarized related literature which has assessed the impact of the CRA, and associated these results with the ongoing debate with the Efficient Market Hypothesis. One additional unforeseen consequence of extending the access to finance to low- and moderate-income borrowers, however, is on the supply side: the increasing frequency of predatory lenders. While predatory lending may be profitable, and increase access, its overall impact may be negative on the borrowing community. This might serve as another issue for the efficient markets debate.

APPENDIX: TERMINOLOGY

CRA-regulated lenders refer to federally regulated banks and thrifts as well as their mortgage company and finance company affiliates. CRA-eligible loans refer to loans made to lower-income households and/or households living in lower-income areas. Assessment areas refers to areas where they maintain deposit taking operations.

Lower-income borrowers are defined as having incomes less than 80 percent of metropolitan area median income, and lower-income communities are census tracts with 1990 median family income that was less than 80 percent of their metropolitan area median.

Low- and moderate-income (LMI) borrowers, and borrowers who live in LMI areas, and loans to such persons, are referred to as "CRA-eligible borrowers," "CRA-eligible loans," or "CRA-eligible lending", respectively.

The term minority is used to mean African American or Hispanic and the term white is used to mean non-Hispanic white, even though many Hispanic Americans have European or white racial backgrounds. Black is used as a synonym for African American.

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MEASURING EMERGING STOCK MARKET CORRELATIONS UTILIZING THE GRAVITY MODEL

Jui-Chi Huang, Harrisburg Area Community College
Aysegul Ates, Akdeniz University
Tantatape Brahmasrene, Purdue University North Central

ABSTRACT

Gravity models have been employed in determining international trade patterns among countries. In these models, geographical and cultural variables are found to be crucial factors of economic relations. This particular study suggests that application of gravity modeling also is useful for the explanation of stock market correlations. This study uses panel data to examine the effect of geographical, cultural, market size and economic variables on the stock market correlations in emerging markets. Empirical analysis found that distance, market size and legal system similarities have a profound impact on stock market correlations. This knowledge is an important prerequisite for the risk reduction.

INTRODUCTION

Gravity models borrowed the idea from Newtonian Physics, where the attraction between two objects is positively related to their mass and negatively related to their distance. The gravity models have been effectively employed in modeling bilateral trading between countries since the 1960s. The use of gravity models in international trade can be found in Bergstrand (1985) and Feenstra, Markusen & Rose (2001). These baseline models explained bilateral trade flows using gross domestic products (GDP) and distance among countries. In recent years, other distance variables, such as common language and common borders, were added into the model. Rauch (2001) suggested that cultural ties were part of the network effect which influenced international economic relations. Gravity models have indicated that distance matters for trading in product markets. The initial motivation behind this research was to assess whether this similar movement

occurred in financial markets as well. The interrelationship between international stock markets is a major issue in international risk management. In particular, the paper will examine whether the stock market correlations in twenty emerging markets are affected by geocultural differences and economic variables over the period of 1995 to 2002.

REVIEW OF RELATED LITERATURE

In the past decade, a number of empirical and theoretical studies focused on the extent of stock market linkages and the reasons behind these linkages. Previous research has studied stock market correlations in terms of time varying properties of the correlations. Hamau, Masulis and Ng (1990) examined daily opening and closing prices of major stock indices of London, Tokyo and New York stock markets. They found that there were spillovers from New York to Tokyo, London to Tokyo, and New York to London for the pre-October 1987 period. Longin and Solnik (1995) constructed a Generalized Autoregressive Conditional Heteroskedasticity (GARCH) model to investigate the behavior of monthly international equity returns from 1960 to 1990. Their results suggest that the correlation between these returns was dynamically changing in their research. Karolyi and Stulz (1996) studied the United States and Japan's indices. They discovered evidence of changing correlations in the daily returns of these countries.

More recently, Bessler and Yang (2003) found a long-run relationship between nine stock market prices. They showed that only US financial markets had a significant impact on other markets. Time series models in general allow us to study long-run and short-run relationships. However, they do not identify what drives market co-movements. Several studies have examined factors that influenced market co-movements. For example, when explaining stock market co-movements, Roll (1992) proposed a Ricardian explanation based on country specialization. However, Heston and Rouwenhorst (1994) found that country specialization by industry could not explain stock market co-movements. They found that country effects due to monetary, fiscal, cultural differences were helpful to explain co-movements. Dumas, Harvey and Ruiz (2003) studied the extent to which stock return correlations were justified by changes in national outputs by using 12 Organization for Economic Co-operation and Development (OECD) countries. Bracker, Docking, and Koch (1999) highlighted the importance of the bilateral trade. By employing data from nine countries over the 22 year period, they argued that its macroeconomic and linguistic determinants affected the extent of stock market co-

movements over time. These studies mostly relied on industrialized countries' data since their stock market data were more readily available.

Physical distance is relatively less frequently applied in financial studies. Gravity modeling focuses on cross-sectional properties of the stock market correlations. The underlining forces influencing equity market correlations are psychological, financial (currencies & market sizes), and geocultural (distance & language) factors. Modeling the impact of distance on financial markets is a recent trend in the literature. Portes and Rey (2002) studied bilateral equity flows of fourteen countries in OECD from 1989 to 1996. In addition to using distance variable in the model, they included market capitalization, investor sophistication, volume of phone calls, proxies for insider trading, exchange rate stability dummy, and covariances between GDPs and growth rates. Their results were mixed. Distance had a negative effect on equity flows in 1989. The effect became positive in 1996. Wei (2000) used a gravity model to explain log bilateral FDI and bank lending. He found that the coefficients on distance were negative for both FDI and bank lending. Flavin, Harley, and Rousseou (2002) applied the gravity model to explain stock market correlations in twenty seven countries using only 1999 data. Their data set contains developed countries as well as developing countries. Their results suggest that distance matters in financial markets co-movements. Depending upon the research question, the main explanatory variables of the gravity models typically include the economic size of both countries, the distances between countries, size of population, common language and common border to name but a few.

HYPOTHESIS

Trading in financial markets is different from trading in product markets. The distance variable in goods trading is used as a proxy for transportation costs. In traditional gravity models of international trade, the literature has interpreted the distance coefficient as evidence of transportation costs. Buch, Kleirnert, and Toubal (2003) and Frankel (1997) argued that the distance coefficient was an indicator of the relative importance of economic relationships between two countries. They claimed that distance costs were captured in the constant term rather than the coefficient of the distance variable. However, asset trading is weightless and therefore distance coefficients cannot approximate transportation costs. According to Portes and Rey (2002), the existence of geocultural distance creates information asymmetries between countries and affects the investment decision among them.

Locals will have information advantages compared to investors from distant countries. Coval and Moskowitz (1999) also offered the asymmetric-information-base explanations for international capital market segmentation. Informational asymmetries lead to less correlated markets. In sum, the distance coefficients can be interpreted as information costs. Thereby, stock market correlations are negatively related to distance in the model constructed in the following section.

Huberman (2001) found that the familiarity bias exists in portfolio diversification. Investors may have biases in their investment decisions. They generally prefer to invest in the companies they are more familiar with. Familiarity with destination countries plays an important role in portfolio choices. Tesar and Werner (1995) noted that geographic proximity was an important ingredient in portfolio allocation decisions. Therefore, language similarity and common border variables affect the stock market correlations.

Language variable is included as a proxy for cultural closeness. Common language brings a better understanding of the two markets. Investors pay close attention and tend to invest more in financial markets where they understand the language. Even though, some Latin American countries do not use the same language, their stock markets may be correlated because of their geographic proximity. However, this correlation is captured by a distance variable. The language familiarity variable is predicted to have a positive coefficient.

A border dummy also is included to capture the neighborhood effect on the stock market correlations. Similar to geographical distance, countries with a common border are expected to have higher correlations.

Furthermore, the larger the market capitalization (also known as market value), the more integrated the world economy would be due to better communications, better financial infrastructure and more well informed investors in other markets. Market capitalization of listed companies is the share price times the number of shares outstanding. Listed domestic companies are the domestically incorporated companies posted on the country's stock exchanges at the end of the year. Market size is a product of market capitalizations of two countries. As an indicator of financial integration, this variable is directly or positively related to the two countries' stock market correlations.

The gravity model classifies explanatory variables into "push" and "pull" factors. Push factors are distance variables and pull factor is market size. The above hypothesis leads to the following model specification. Bilateral stock market return correlations are inversely related to geographical distance but directly affected by language similarity, common border dummy, and the market size factors.

Three models are constructed due to availability of three different panel data. Each model consists of different number of observations.

MODEL 1

$$CORR_{ijt} = \beta_0 + \beta_1 DISTANCE_{ij} + \beta_2 LANGUAGE_{ij} + \beta_3 BORDER_{ij} + \beta_4 SIZE_{it} * SIZE_{jt} + \epsilon$$

where,

CORRijt are bilateral stock market return correlations or cross-market correlations in stock markets between county i and j in year t. It is then transformed into z'=[ln(1+r) - ln(1-r)].

DISTANCEij is the geographical distance measured by the great circle between largest cities according to Fitzpatrick and Modlin (1986).

LANGUAGEij denotes the language similarity ranging from 0 (nobody speaks the same primary language in the two countries) to 10,000 (everybody speaks the same primary language. For further details, see Boisso and Ferrantino (1997).

BORDERij is the common border dummy. It is one if two countries have a common border.

SIZEit*SIZEjt represents the financial market size between two countries. It is the multiplication of two countries' market capitalizations.

ϵ is a stochastic error or disturbance term.

MODEL 2

This study further investigates the impact of legal characteristics of the countries on the stock market correlations. Legal system similarities influence regulatory environments, corporate governance, the investment climates and might reduce contracting costs and information asymmetries. LaPorta, et al. (1998) indicated four major law families. The proximity of legal system dummy is added to capture the effect of similar legal system on stock market correlations according to LaPorta, et al. (1998). The second empirical model is specified below.

$$CORR_{ijt} = \beta_0 + \beta_1 DISTANCE_{ij} + \beta_2 LANGUAGE_{ij} + \beta_3 BORDER_{ij} + \beta_4 SIZE_{it} * SIZE_{jt} + \beta_5 LEGAL\ SYSTEM_{ij} + \epsilon$$

where:

LEGAL SYSTEM$_{ij}$ is a dummy variable that takes the value of one if two countries' legal system originates from the same system, and zero otherwise.

The legal system and language variables are constructed to ensure relatively low correlation. Language variable is a continuous variable ranging from 0 to 10,000 as determined by Boisso and Ferrantino (1997) while the legal system is a dummy variable according to La Porta et al. (1998).

MODEL 3

Economics variables represent interdependence and interaction among countries. Economic linkages affect the stock market correlations. In general, economic integration should raise the degree of co-movements across national economies. Three economic variables are added to determine the effect on stock market return correlations in emerging market co-movements: (1) Bilateral trade is a direct link between equity market integration. It is expected to affect stock market return correlations positively. If two countries are isolated from each other with no trade, the stock market returns should be less correlated. (2) When the interest rate rises, the cost of capital will increase. Subsequently, equity investments and the prices of stock will fall. If the money markets in a pair of countries have a higher level of linkage, then their interest rates tend to move in the same direction causing higher correlation. (3) Inflation has a negative impact on the stock market returns. The third model with these additional three variables is presented below.

$$CORR_{ijt} = \beta_0 + \beta_1 DISTANCE_{ij} + \beta_2 LANGUAGE_{ij} + \beta_3 BORDER_{ij} + \beta_4 SIZE_{it} * SIZE_{jt} + \beta_5 LEGAL\ SYSTEM_{ij} + \beta_5 BTRADE + \beta_5 INTRATE_{ij} + \beta_5 INFRATE_{ij} + \epsilon$$

where:

BTRADE represents product of trade/GDP ratios.

INTRATE$_{ij}$ is the annual correlation of percentage change in short term interest rates transformed into z'.

INFRATE$_{ij}$ is the annual correlation of inflation rates transformed into z'.

DATA

The list of twenty countries under study is provided in Table 1. These markets are classified as emerging markets according to the classification criterion adopted by the World Bank's International Financial Corporation (IFC). The IFC definition includes those countries with income levels classified by the World Bank from low to middle income levels.

Table 1: Emerging Markets Under Study

ASIA	LATIN AMERICA	AFRICA & MIDDLE EAST	EASTERN EUROPE
China	Argentina	Egypt	Hungary
India	Brazil	Israel	Poland
Indonesia	Chile	South Africa	Turkey
Korea	Mexico	Morocco	Greece
Malaysia	Peru		
Philippines			
Thailand			

The annual pair-wise correlations of emerging stock market returns in twenty countries were calculated from daily stock market returns for each year. All daily stock market data were taken from Standard & Poor (S&P)'s International Financial Corporation database. The target coverage of the S&P's Global index is about 65 to 75 percent of total market capitalization. Stocks were drawn in order of their liquidity. The daily Total Return Index (U.S. dollar denominated) was used to calculate annual stock market correlations between two countries. The daily stock index from twenty emerging markets for the period of eight years generated (20x19)/2=190 cross-country correlations (pair wise) each year.

Physical distance, language similarity and common border are a subset of the gravity model database of Boisso and Ferrantino (1997). These data are available at web page: http://csf.colorado.edu/mail/itcp/2001/msg00005.html. Data for land borders come from the Central Intellegince Agency (CIA) World Factbook. Market capitalization data in current U.S. dollars are from World Development Indicators (WDI) database, S&P's Emerging Stock Markets Fact Book and Supplemental S&P's data.

La Porta et al. (1998) classifies countries in their study into four categories according to their legal origin: English, French, German, and Scandinavian. The legal system variable is constructed using these classifications and the information from CIA World Factbook.

Monthly interest rate, inflation rate, and annual GDP data are from International Monetary Fund (IMF)'s International Financial Statistics (IFS) database. Bilateral trade data is obtained from IMF's Direction of Trade Statistics (DOTs) database.

METHODOLOGY

The generalized least square (GLS) method is employed to test the above hypotheses. The stock market correlations are used as dependent variable. Because correlation coefficients is bounded between 1 and –1, this might cause bias in the estimates when it takes extreme values. Moreover, the sampling distribution of Pearson's correlation (r) was not normally distributed. Fisher (1915) developed a transformation now called "Fisher's z' transformation" that converts Pearson's r to the normally distributed variable z'. The formula for the transformation is: $z' = [\ln(1+r) - \ln(1-r)]$. This transformed variable, FISHER1, was employed as a dependent variable. Flavin, Hurley & Rousseau (2002); and Bayoumi, Fazio, Kumar & MacDonald (2003) also adopted a modified form of this transformation with the weight, 0.5. Thus, $z' = 0.5[\ln(1+r) - \ln(1-r)]$. This transformation, FISHER2, was also used as dependent variable. Only FISHER1 results are reported in Table 2 because regression results of transformed variables (FISHER1 and FISHER2) are virtually similar.

The pooled data was preformed so that the pooled series were restricted to have the same coefficient across all members of the panel data and with weighted least squares (Generalized Least Square method with equal weights).

The border length data were also collected. The preliminary regression testing suggests that the border length data are not significant. An alternative variable called "border dummy" was implemented instead in order to differentiate the impacts of countries with and without common border.

EMPIRICAL RESULTS

Table 2 presents strong regression results. The results are as expected for the physical distance variable (DISTANCE) in the regression equation (1) with

CORR, FISHER1 as dependent variables. The DISTANCE coefficients are significant at 1 percent level under CORR model and at 5 percent level for the FISHER1 specification. The signs are all negative, as predicted.

Table 2: Panel Regressions for Emerging Stock Market Correlations 1995-2002

	CORR			FISHER1		
	Model 1	Model 2	Model 3	Model 1	Model 2	Model 3
Constant	0.273	0.215	-0.005	0.479*	0.362	0.192
	(1.3674)	(1.0685)	(-0.0242)	(1.7157)	(1.2927)	(0.6615)
Distance	-0.041***	-0.044***	-0.029*	-0.054**	-0.058***	-0.062***
	(-2.6410)	(-2.8023)	(-1.6656)	(-2.4150)	(-2.5819)	(-2.6248)
Language	0.003	0.001	0.006	0.004	0.001	0.004
	(0.5094)	(0.1303)	(0.9311)	(0.4372)	(0.0545)	(0.4253)
Border	0.042	0.009	-0.033	0.101	0.051	-0.008
	(0.6344)	(0.1503)	(-0.4231)	(1.00618)	(0.5093)	(-0.0713)
Market Size	0.021***	0.024***	0.029***	0.022**	0.027**	0.038***
	(2.7599)	(3.0419)	(3.4126)	(2.0306)	(2.4639)	(3.3615)
Legal System		0.080***	0.061**		0.126***	0.109***
		(3.3200)	(2.4165)		(3.7471)	(3.3147)
Bilateral Trade			0.000			0.000
			(1.4866)			(0.8297)
Interest Rate			-0.054			-0.014
			(-1.5372)			(-0.7455)
Inflation			-0.008			-0.002
			(-0.3769)			(-0.2766)
R-square	0.13	0.14	0.16	0.07	0.09	0.13
Adjusted R-square	0.12	0.13	0.15	0.07	0.08	0.13
F- Statistics	51.38	44.59	27.48	28.58	26.52	20.75
Number of observations	1,428	1,420	1,181	1,428	1,420	1,181

Note: The parentheses are t-values.
*, **, and *** indicate the significant levels at 10, 5, and 1 percent, respectively.

Both coefficient estimates of the language similarity and border dummy variables have expected positive signs but are not statistically significant.

The market size is positively related to the stock market correlations for all empirical specifications. The coefficient estimates are significant at 1 percent level for CORR model and at 5 percent level for FISHER1 model.

When the legal system dummy are added into model 2, the distance variable, and market size variables are still significant with correct signs. This suggests that controlling the legal environment does not take away the explanatory power of the physical distance and market size variables. The coefficient estimates of the legal system similarity are significant at 1 percent with positive sign. The legal system similarity is also an important factor in explaining equity market correlations. The third panel, consisting of additional economic variables, confirms model 2 results. Distance and legal variables still maintain a significant effect in explaining cross market correlations while all economic linkage variables are insignificant.

While these models provide strong significant levels on coefficient estimates of distance, market size and legal system variables, the coefficient of multiple determination (R^2 and adjusted R^2) ranges from 0.07 to 0.16. This indicated that the variations of distance, market size and legal system variables could explain 7 to 16 percent of variation in the bilateral stock market return correlations. The overall explanatory power of the model (R^2) is relative low compared to other articles that use the gravity model. Among other articles that employed the gravity model, Flavin, et al (2002) found the R^2 equaled 0.75 while other studies ranged from 0.35 to 0.60. Flavin, et al found high R^2 when they used only 1999 cross sectional data from 27 developed countries. However, it is rather common to obtain low explanatory power when emerging market panel data is employed as found in this paper. This may be due in part to the dispersion of the emerging market correlations throughout the sample. One year correlations between country-pairs seem to be stronger than multiple year correlations. Emerging markets are not strongly connected amongst themselves. For example, there are few financial institution connections between South Africa and South Korea compared to those in developed countries. The correlation between US and UK stock markets is high as markets are more integrated and more efficient.

Furthermore, including additional independent variables such as currency or industrial sector index as used by Flavin, et al (2002) may increase R^2. It is beyond the scope of the gravity model in this paper which aims only at geographical, cultural and legal factors. Case in point, it may be less justifiable to

compare R^2 of various gravity models with different applications, specifications and focuses. The estimated coefficients in this paper should be stable and statistically acceptable when the model is properly specified and accepted econometric methods are employed in the analysis. Therefore, the benefits of this research extend beyond the low R^2 values typical of emerging market panel data.

DISCUSSION

There is evidence that physical distance does matter to the linkages between two emerging financial markets, even though some studies show that the impact of physical distance on the stock market correlations is not clear among the developed financial markets. Our results confirm the findings of Flavin, Hurley, and Rousseou (2002) and Portes and Rey (2002).

The language variable in all three models is found to be insignificant. The language similarity ranges from 0 (nobody speaks the same primary language in the two countries) to 10,000 (everybody speaks the same primary language). The spread of this data among those countries under study may be too "wide" in the sense that it generates the "bipolar" data measures. The data is skewed by the fact that it relies on either every one speaking the same language (10,000) or different languages (0). Due to the extreme data distribution, the log transformation was performed on this variable. However, it did little to improve the empirical estimations. The insignificance of a border dummy provided no further insight into whether the bordered countries have higher financial market linkages in emerging markets.

However, the significant market size variable indicates that larger and greater developed markets react to the news more rapidly with better financial connection. Market size variable can also be interpreted as a measure of financial integration between two countries. Thus, the results suggest that more integrated financial markets induce the stronger market co-movements.

The legal system of a country influences business and in turn financial markets. Equity markets bears imprints of legal characteristics of the countries they developed within. LaPorta et al. (1997) studied the influence of legal environment on capital markets across countries. Their results suggested that there were differences among countries with different legal origins in the size of their capital markets. The result confirms that legal system similarity has positive influence on cross market correlations.

Bilateral trade, interest and inflation rate correlations have expected sign but are not statistically significant. This might be due to the well documented significant influence of distance variable on bilateral trade.

CONTRIBUTIONS

This paper makes three contributions to the literature on gravity equation. First, the early literature estimated the gravity models with cross-sectional data. This research explored 1995-2002 panel data to determine the annual pair-wise correlations of emerging stock market returns. It covered a longer time horizon compared with only one year cross sectional data used by Flavin, Harley, and Rousseou (2002). Second, the paper focuses on twenty emerging stock markets. This is particularly important because of their relative isolation from developed capital markets. Bekaert and Harvey (1997) explained that emerging market equities had different characteristics than equities from developed capital markets. Third, it is evident from this research that the gravity model can be employed effectively in the financial market. The empirical results suggested that distance, market size, and legal system similarities play a significant role in emerging stock market co-movements.

PRACTICAL IMPLICATIONS

Does gravity play a role on the co-movements of financial markets in emerging economies? Answers to this question have implications for portfolio diversification and cross-market hedging of macroeconomic risks in the emerging markets. If the correlation between stock market returns is the key to international diversification decisions then its determinants also have implications for diversification. Most researches in stock market co-movements concentrate on equity market co-movements in industrialized countries rather than in emerging markets. Results in this paper suggest that distance is an important determinant of international financial activity among emerging markets. Increasing distance diminishes linkages among different financial markets. Early literature found evidence of the benefits from diversely investing in outside domestic markets. Investment in assets outside domestic markets provides risk reduction opportunities (Grubel 1968). Hence, from an investor's point of view, international diversifications among physically distant emerging markets may benefit investors.

The market size variable can be interpreted as a sign of financial integration. Financial integration induces stronger market co-movements. In retrospect, the results provide useful information about future vulnerabilities in emerging markets since, physical closeness, market size, and legal system variables are important linkages between stock market correlations among countries.

CONCLUSION

Much of the previous literature placed emphasis on estimation and forecasting of correlations among stock market indices over time. These researches mainly focused on equity market data of industrialized countries. Gravity models have been successfully adapted in modeling international trade patterns for product markets. This paper investigated whether the model performed as well in explaining financial market correlations in emerging markets. In the gravity model, distance variables or push factors, and market size or pull factors, play an important role. Therefore, this research explained stock market correlations by focusing essentially on gravity modeling variables such as physical distance, language, and market size. Furthermore, legal system similarity, trade linkages, interest rate change and inflation rate correlations were integrated into this gravity model to determine prevailing explanatory power of distance. The physical distance and market size variables were found to be significant among all variables. In addition, the legal system similarities as a sign of corporate work environment also had significant explanatory power across market correlations.

Further research might incorporate the exchange rate risk into the gravity model framework. It is imperative for international investors to recognize the importance of exchange rate risk and its intensity that affect stock market co-movements.

AUTHORS' NOTE

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REASSESSING THE CASE OF ECUADOR'S DOLLARIZATION

David A. Matthews, Sam Houston State University
Balasundram Maniam, Sam Houston State University
Hadley Leavell, Sam Houston State University
Claudine Burke, Sam Houston State University

ABSTRACT

The purpose of this paper is to conduct a cost/benefit analysis of Ecuador's decision to dollarize its economy in 2000. The study begins with a review of the literature pertinent to dollarization. The following section discusses the factors that led Ecuador to dollarize its economy. The study next discusses the benefits of dollarization through comparisons of economic theory with empirical data and select competitiveness rankings for the period 1997-2002. The study further continues the assessment of dollarization by comparing the costs with the empirical data available for the same period. The final section summarizes the study.

INTRODUCTION

The currency of nations serves three necessary functions: as a unit of exchange, as a store of value, and as a unit of account. All three functions must coexist for the currency to fulfill its proper role in the national economy. However, in the course of macroeconomic shocks to a particular nation's economy, a currency may lose one of these indispensable properties and, therefore, cease to function efficiently. These macroeconomic shocks may be the resultant outcome of high interest rates or high inflation that undermines the public confidence in the value and/or exchangeability of money, which leads to a loss of domestic and international support in the ability of money to serve its properly intended purpose.

This paper explores the tumultuous political-economic situation of Ecuador during the late 1990s and early 2000s. During this period, Ecuador experienced a near-total breakdown of its monetary system, through both exogenous and endogenous macroeconomic shocks, which ultimately led the country to abandon its national currency, the sucre, and adopt the U.S. dollar. This adoption process is

referred to as dollarization. More generally, official dollarization occurs when one nation adopts and recognizes the currency of another nation as the legitimate tender for all transactions, domestic and foreign, while simultaneously abolishing its own national currency. The process of dollarizing a nation is perhaps the most drastic monetary action that a nation can undergo; a subsequent reversal is virtually impossible.

For politicians and economic pundits alike, the idea of dollarizing a national economy has become in recent years the subject of wide and controversial debate, fraught with misconceptions and substantiated with vague empirical evidence. Current political-economic thought has reached no consensus as to the full extent of benefits and costs that can be attributed to the nation that pursues monetary dollarization, as each is quite extensive and extremely difficult to quantify. This general lack of qualified agreement has created a void in the understanding of the consequences associated with the decision to adopt a policy of dollarization. This void offers the distinctive opportunity for this paper to examine the economically accepted costs and benefits of dollarization and to measure each with the costs and benefits that have actually been observed to exist in the Ecuadorian economy since dollarization. Each theoretical cost and each theoretical benefit will be assessed using a scorecard of macroeconomic variables and competitiveness rankings to test whether or not the economy has achieved the anticipated benefits and costs in each area. For all elements of comparison, the data have been selected and compiled for the years 1997-2002 from the *Global Competitiveness Report* and the *Latin-Focus* group.

LITERATURE REVIEW

Much research has been conducted in the last few years on dollarization and its costs and benefits. LeBaron and McCulloch (2000) found dollarization a positive monetary arrangement for nations whose anti-inflationary policies lack the requisite credibility to be effective. They further argued that emerging economies that have pegs or currency boards are able to most effectively benefit from dollarization, especially if other variables, such as seigniorage-sharing agreements, are accounted for. Bogetic (2000) looked at the experience of Panama under dollarization, concluding that the nation had achieved highly beneficial gains from the program. Panama has been free of the banking crises that have continually plagued other Latin American nations. Bogetic concluded that the benefits of dollarization substantially

outweigh the costs, due to technological innovations that have reduced money demand and, therefore, lessened the losses from seigniorage.

Calvo (2001) found that policymakers in Latin America generally have non-credible policies, which results in extremely volatile and high interest rates. As an extreme form of fixed exchange rate regime, dollarization is a plausible and beneficial choice to adopt in these nations. Dollarization may potentially offer these non-credible nations an increased credibility in their policy making. Calvo (2002) looked also at dollarization and concluded that it has positive economic effects if there exists a complete understanding of the initial conditions of the adopting nation. Emerging markets that are highly liability dollarized are, through their liabilities, poised for official dollarization without little incurrence of costs. Additionally, dollarization may aid in the creation of a more competitive domestic economy through reducing the risks of devaluation that cause high interest rates.

Eichengreen (2002) suggested that countries should implement policy reform before dollarizing their economy, because dollarization may not in itself lead to policy reforms. Once policy reforms have been implemented and strengthened, dollarization can serve as the principle that ensures their permanence. Dollarization, additionally can strengthen the banking system, but must not be seen as a cure-all. Supervision, regulation, and foreign openness, must also exist, and be enhanced by the support of dollarization. Fischer (1982) looked at the seigniorage loss costs of dollarization and the cost of giving up national autonomy in money creation. It was concluded that dollarization usually is implemented in nations whose policies are highly inflationary. This, weighed against the costs, is a primary benefit for the adopting nation in that discipline is imposed on what might otherwise be a nation's highly inflationary monetary policies.

Gale and Vives (2002) found, through their examination of the costs and benefits of dollarization, that some East Asian and Latin American countries would benefit greatly from dollarization through a strengthening of their banking system. Among these nations that would benefit, it was pointed out that the costs would be substantially less of a burden for the East Asian tigers, Ecuador and Chile than they would be for other countries. Hanke (2003) contended that dollarization is highly beneficial for nations whose national monetary systems fail to follow the rule of law. Dollarization was postulated to enhance the country through stability and credibility. Additionally, Hanke laid out six national reforms that must be undertaken to achieve the full benefits of dollarization: a change in banking regulations, an implementation of fiscal controls, a simplification of the tax system, a change in voting systems, a scheme for national deregulation, and a scheme for privatization.

Jameson (2003) postulated that not many countries would willingly choose to follow Ecuador's decision to dollarize by noting that the short-term success of Ecuador may primarily be due to specific conditions prevailing in its economy. Argentina's recent abandonment of its fixed rate regime in the face of economic adversity is a reminder that countries fear irreversible policies such as dollarization. In light of his research, Jameson concluded that other countries may undertake dollarization only as a last ditch policy option. Larrain and Tavares (2003) benchmarked the decision of nations to dollarize against the success and the particulars of the European Union. In their study, real exchange rate volatility measures were found to be highest in South America, indicating that Latin American countries had a higher level of integration with the U.S. than with each other and would therefore naturally tend to adopt the U.S. dollar as opposed to creating their own regional currency.

THE DOLLARIZATION OF ECUADOR

During the late 1990s, a complex series of shocks to the macroeconomic well-being of Ecuador ultimately forced the nation to abandon its domestic currency, the sucre, and dollarize its monetary system. Beckerman (2002) attributes the causes of this "predollarization" crisis to eight distinct, yet interrelated, shocks:

> "Structural problems that clearly affected the evolution of the crisis [include] (a) the dependence of public revenue on volatile oil earnings, (b) the banking system's exposure to volatile and risky activities, (c) bank borrowers' exposure to exchange-rate depreciation, (d) inadequate banking supervision, (e) the massive public debt, (f) political fragmentation, (g) weak public administration, and (h) the government's tendency to revert to energy subsidization." (p. 59)

Initially, the roots of the monetary crisis in Ecuador were attributable to exogenous shocks. These shocks affected Ecuador's ability to control its domestic supply of circulating money and the rising level of domestic price. Ecuador was also unable to stem the precipitous fall of its exchange rate. These results occurred as the public deficit of Ecuador, due mainly to lower oil revenues and a reduced tax base, began rising during 1998. As the government increasingly faced budgetary shortfalls of its own, the domestic banking sector began facing liquidity problems because of bad loans and retracted foreign credit. The government, in an effort to control its deficits and to ensure the soundness of and confidence in the domestic

banking system, began a process of insuring the majority of banking deposits, imposing a freeze on account withdrawals, and allowing the domestic currency to freely float on the open market (Beckerman and Solimano, 2002).

Table 1. Ecuadorian Macro-Performance Indicators, 1997-2002

	1997	1998	1999	2000	2001	2002
GDP (US$ bn)	23.6	23.3	16.7	15.9	21.0	24.5
GDP per capita (current US$)	2,117	2,039	1,431	1,339	1,729	1,975
GDP (annual variation in %)	4.1	2.1	-6.3	2.8	5.1	3.4
Unemployment (% of active population)	9.2	11.5	14.4	9.0	10.9	9.2
Inflation (CPI, annual variation in %)	30.7	43.4	60.7	91.0	22.4	9.4
Interest rate (benchmark %)	8.7	10.9	9.1	7.7	5.1	5.0
Exchange Rate (vs. US$, end-of-period)	4,428	6,825	20,243	25,000	25,000	25,000
Trade Balance (US$ million)	523	-1,035	1,545	1,399	-397	-1,004
Exports (annual variation in %)	8.7	-19.6	4.6	12.0	-5.4	8.6
Imports (annual variation in %)	21.9	10.4	-44.5	23.1	41.6	19.6
International Reserves (US$ million)	2,270	1,796	873	1,180	1,074	1,008
International Reserves (months of imports)	5.6	4.0	3.5	3.9	2.5	2.0
External Debt (US$ million)	14,918	15,140	15,902	13,110	14,360	16,288
External Debt (% of GDP)	63.1	65.1	95.4	82.3	68.3	66.4
Moody's	Baa3	Baa3	Ba2	Ba2	Ba2	Ba2
Standard and Poor's	BBB-	BBB-	BB+	BB	BB	BB
Fitch Ratings	-	BBB	BBB	BB+	BB	BB

Source: Latin-Focus, 2004. Available at:
http://www.latinfocus.com/latinfocus/countries/ecuador/ecueireal.htm

The decision to float the sucre precipitated a monetary free fall as market-correcting forces brought the currency to its true value. In fact, the value of the sucre fell from 6,825 sucres per US dollar in 1998 to 20,243 per US dollar in 1999 (see Table 1). Subsequently, the exchange rate was fixed at 25,000 in 2000. Table 1 lists selected measures of Ecuadorian macroeconomic performance for the years 1997-2002. The governmental insurance of deposit accounts was a measure designed to bolster domestic confidence in the banking system. However, the moratorium placed on withdrawals served only to increase depositor concerns and

eventually led to massive cash withdrawals and flight of capital as the freeze was lifted.

As Table 1 shows, the international reserves of Ecuador continually declined from 1997 through 2000, both in total and as measured in months of imports. In addition to the loss of cash, capital and foreign reserves, the government exacerbated the domestic rate of inflation by printing excess quantities of money as it attempted to insure the deposits of increasingly unsound banking institutions. The Ecuadorian rate of inflation rose from 43.4 percent in 1998 to 91.0 percent in 2000 at the height of the crisis. The proverbial straw the broke the camel's back occurred in August of 1999, when the situation in Ecuador worsened and caused the nation to default on its Brady bond issues. The amount of this default amounted to approximately 6.5 billion dollars, or one-half the public external debt. By the end of 1999, the economy of Ecuador was in such a state of disarray that the government had lost the ability to control its domestic money supply, its domestic price level and the exchange rate. The external debt and unemployment rate of Ecuador had continued to rise while necessary credit and financing was siphoned out of the nation's financial institutions. Ecuador had only two policy choices: either a total adoption of the dollar or a devastating bout of hyperinflation (Beckerman and Solimano, 2002). It was during this tumultuous crisis that Ecuador's president, Dr. Jamil Mahuad, announced in January 2000 the intent of the government to follow a process of complete dollarization of the economy. Dr. Mahuad was immediately forced out of office; his successor Gustavo Noboa completed the transition. (Bureau, 2006)

ASSESSING THE BENEFITS OF DOLLARIZATION

The benefits of dollarization on the macroeconomic well-being of the adopting nation are extremely difficult to quantify, and, therefore, must be measured from the theoretical and rational point of view in order to more fully understand their significance in the macroeconomic aspects of the Ecuadorian economy. Unlike the short-term measurable costs, the benefits of adopting the dollar are long-term in nature and have few well-studied precedents to offer clues as to their proper measurement. Therefore, this section will merely pose the theoretical benefits most accepted by the political and economic subject experts, and measure those facets in against the World Economic Forum's *Global Competitiveness Ratings* for the years 1997-2003, as indicated in Table 2. These measures assess the competitiveness and

credit of Ecuador relative to 102 other nations, with number 1 being the highest-rated nation and number 102 being the lowest-rated nation.

Table 2. Ecuadorian Competitiveness Ratings, 1997-2003			
	1999	2001	2003
Country credit rating	58	71	81
Access to credit	54	75	91
Soundness of banks	58	75	98
Macroeconomic stability	N/A	N/A	83
Growth competitiveness	53	68	86
Recession expectations	N/A	N/A	71
Source: The Global Competitiveness Report, 1997-2004, World Economic Forum.			

Policy Credibility

The first, and perhaps most common, among the agreed upon hard-to-quantify benefits of dollarization is the extent of the stabilizing effect on the economy and political atmosphere of the adopting nation (Mendoza, 2001 and Eichengreen, 2002). This stabilizing effect or "credibility," is associated with the permanence and irrevocability of the decision to adopt the dollar (Berg and Borensztein, 2003). This governmental credibility springs from the durability of dollarization and the many difficulties involved in reversing or altering such a policy decision, as is possible with other exchange rate regimes, in the face of adverse economic situations. Hanke (2003) notes the increased confidence, domestic and foreign, attributable to dollarization, and the subsequent increased financial and political stability and economic performance. Chang (2000) argues that through the adoption of an exogenous national currency such as the dollar, which is acknowledged to be of strong economic superiority, the adopting nation may attain greater stability in a great many aspects of its economy. This credibility can result in lower and more predictable rates of domestic inflation through the imposition of the monetary policy of the more stable country, thus shielding the adopting nation from idiosyncratic shocks. These shocks include, "fiscal shocks, pressure by interest groups to devalue the currency to gain competitiveness, [and] temptation to use

monetary policy to dilute the real value of nominal commitments" (Panizza, et al, 2003, p. 177).

Lower rates of inflation and interest can open the door to longer-term domestic financing in the country, such as other dollarized nations enjoy (Bogetic, 2000). As can be seen in Table 1, inflation has indeed diminished greatly in the period immediately following dollarization. In the year 2000, inflation soared to unprecedented levels as the sucre was valued at an artificially low 25,000-to-1 exchange rate; however, after the initial shocks, the Ecuadorian rate of domestic inflation was brought under control, subsequently dropping to historic lows. These credibility benefits, like the other benefits of dollarization, are extremely complicated and remain quite difficult to measure because of their broad scope and the long-term nature of their assessment (Chang, 2000). Further, the primary benefit of credibility is qualitative. The intransigence of monetary matters offers assurance to investors, domestic entities, and others that the currency will not be abandoned or debased. In fact, nations utilizing other exchange rate regimes may be tempted, in the face of such deteriorating economic conditions, to abandon such regimes in favor of a short-term solution. Dollarized economies like Ecuador, to the contrary, if tempted to abandon their dollarization, would be faced with the cost-prohibitive option of issuing new domestic currency to exchange for dollars (Chang, 2000).

Risk and Credit

Dollarization, through the stabilizing effects of reducing currency-devaluation risk, may lower the cost of foreign credit available to the adopting nation (Larrain and Tavares, 2003 and Bogetic, 2000). Risk compensation is twofold. First, the spread for devaluation risk, which is a premium to compensate lenders for the risk that the currency of the borrower may be worth less tomorrow than it is today. Secondly, the sovereign risk is a premium to compensate lenders for the risk that the borrowing country may default on its debt repayment (Chang, 2000). Although devaluation risk may decrease, sovereign risk may still exist and thus the benefits of risk reduction may be hard to quantify. However, through the reduction of currency-devaluation risk, lender nations are able to receive signals that the stability of the dollarized nation is of a higher quality of permanence than that of the nation whose currency is subject to the speculative disruptions of currency traders and ill-founded governmental policy decisions (Berg et. al, 2003). From a medium-term political-economic perspective, the dollarization of Ecuador has been positive and effectual, as Ecuador has obtained easy access to foreign savings and

other dollar resources. However, Ecuador's access to and ability to borrow from the foreign credit markets, which have driven in a large part its economic turnaround, may be coming to an end (Jameson, 2003). As can be observed in the Global Competitiveness indicators in Table 2, Ecuador's country credit rating and its access to credit has fallen relative to the other 102 nations assessed throughout the 2000s. Table 1 shows that the credibility of Ecuador's bond issues has barely risen since the introduction of the US dollar into the economy as the official currency. Although the competitive trend is flat or downward for the credit of Ecuador, it is quite difficult to ascertain what portion of this decline is attributable to dollarization and its after-effects and what portion is attributable to other macroeconomic and political phenomena occurring in the country.

ASSESSING THE COSTS OF DOLLARIZATION

The costs of dollarization revolve around the common theme of a powerlessness and loss of control in domestic matters. Generally, these costs of dollarization are relatively easier to measure in the short term than are the benefits. Although dollarization entails such costs as the loss of national symbolism on monetary instruments and mixed public sentiment, this section examines only those costs believed to have a significant impact on the overall macro-political context of Ecuador.

Independent Monetary Policy

The loss of independent monetary policy control may be the most worrisome consequence of dollarization, in that the adopting nation loses its ability to effectively combat inflation and respond aggressively to economy-wide shocks (Bogetic, 2000). It is through its monetary policy that a nation is able to increase or decrease the quantity of money in circulation and, thus, affects the domestic rate of inflation (Chang, 2000). Beckerman and Solimano contend that the main impetus for the dollarization of Ecuador was to halt the stratospherically high domestic inflation. Inflation rose very rapidly after the initial announcement of dollarization for two primary reasons. First, the exchange rate of sucres for dollars, fixed at 25,000 sucres to one dollar so as not to break the international reserves of Ecuador, required approximately a 300 percent fall in the value of the sucre. On an annualized basis, inflation rose to 91 percent in 2000, just after the announcement of the dollarization proposal, after which it dropped to 22.4 percent, and 9.4 percent,

respectively in 2001 and 2002. Since 2000, the rate of inflation has continued to fall, as can be seen in Table 1. This correction of the inflation rate of Ecuador demonstrates that, despite a lack of monetary policy with which to influence inflation, the stability afforded by dollarization works in such a manner as to lower the rate. Therefore, the loss of independent monetary policy may be a benefit of dollarization as opposed to a cost (Hanke, 2003).

Concern exists that the adopting nation will incur a cost in being fully subject to the monetary policies and economic consequences of the prevailing conditions in the adopted currency's country of origin (Chang, 2000). As a dollarized nation, the monetary policies and actions of the United States' Federal Reserve System have implications, through the dollar currency in circulation, on the macroeconomic well-being of the Ecuadorian economy through ripple effects. If the competitiveness of the U.S. dollar was suspect, Ecuador would suffer the ill consequences that such an event would occasion by its explicit economic association through dollarization. Indeed, any macroeconomic destabilization in the United States could quite possibly equate into macroeconomic destabilization in countries, such as Ecuador, that use the dollar (Bogetic, 2000). It is interesting to note, however, that although the US entered into a mild recession in the early 2000s, Ecuador was unaffected. This may be attributable to myriad causes, such as the small volume of trading conducted with the United States as well as other economic and political factors prevailing in the economy of Ecuador. Indeed, Calvo postulates that dollarization instead increases the size of the adopting nation (Ecuador) relatively, resulting in more certainty and increased incentives, as well as increased predictability and credibility in monetary policy matters (Calvo, 2002 and Larrain and Tavares, 2003).

Competitiveness

Beckerman and Solimano observe that the dollarized nation, although becoming perceptibly more stable in many respects, faces an increased likelihood of becoming less competitive in the global trading arena. The competitiveness of the dollarized nation must be seen in relation to the exchange rate mechanisms of neighboring countries, and the ability of those countries to alter the value of their currency in response to global and regional trade conditions. As an example, Peru and Colombia each have floating exchange rate systems, and are able to adjust the value of their currencies downward to remain viable and competitive in the face of adverse economic conditions. Ecuador does not possess such a freedom under

dollarization, and must, whether agreeable or not, maintain prices in accordance with the value of the dollar even at the risk of losing trade value. The Global Competitiveness ratings show the global competitiveness of Ecuador, as calculated in an intricate variety of ways, has continually fallen relative to other nations throughout the period of measurement. Due to the multi-faceted nature of the political-economic atmosphere of Ecuador, it appears unlikely that dollarization will have any quantifiable impact upon the competitiveness of Ecuador into the near future.

Lender of Last Resort

It is widely believed among economic pundits that the dollarized nation, in forfeiting the ability of its central bank to create new money, loses its ability to act as the lender of last resort for domestic financial institutions. In theory, this inability of the central bank to lend money and prevent financial institutions from failing may lead to potential widespread insecurity and distrust of financial intermediation and an increased inability to control domestic inflation (Chang, 2000). Calvo (2000 and 2001), as well as others (Hanke, 2003 and Bogetic, 2000), dismisses this reasoning, arguing that a central bank does not necessarily need to *print* money to fulfill the lender of last resort function, only that the bank must be able to *lend* money. This means only that the dollarized economy must continually "engage in more planning than advanced economies" (p. 323) in order to have a reserve of currency sufficiently available to bail out financial institutions in the event of instability. Calvo further argues that the inability of the dollarized nation to print money may actually benefit the stability of the economy. He asserts, "if the central bank can freely turn the wheels of the money-printing machine, a Damocles sword will hang on the economy every time there is a slight suspicion that the [lender of last resort] is preparing for action. And the sword is, of course, an inflationary explosion" (Calvo, 2001). Berg et. al further suggest that stability in the banking system will come from domestic faith in the strength of dollar-denominated deposits and the institutions that hold the dollars. They recommend enhancing the faith in the dollar by increasing bank liquidity requirements and bank access to quick sources of funds from which to draw in the event of a banking crisis. However, these increased liquidity requirements would augment the costs associated with financial intermediation (Berg et. al, 2003). As noted in Table 2, the soundness of the Ecuadorian banking system has continuously fallen in relation to the other 102 surveyed countries. Although no sizeable institutional failure has occurred, Ecuador

ranks a dismal 98 out of 102 countries in the 2003 survey. Gale and Vives (2002) further contend that risk taking and shirking on the part of bankers will decrease as the likelihood of massive bank bailouts and other lender of last resort protections diminishes, which is consistent with the lack of bank failures in Ecuador since dollarization.

Seigniorage

The nation that adopts the currency of another nation consequently loses the seigniorage to which it would otherwise be entitled as an originator of money. Beckerman and Solimano (2002) define seigniorage as, "the difference between the real command of resources that the creation of money entails and the low cost of producing (paper) money" (p. 9).The actual costs of the dollarization of Ecuador were measured and quantified arriving at a true cost of implementing the scheme. The two-fold dollarization costs associated with loss of seigniorage could approach 6.2 percent of GDP, or approximately 897 million dollars. This seigniorage cost is composed of two distinct, yet related, costs. First, the costs of immediately exchanging existing stocks of sucre into dollar bills – this cost amounts to roughly 3.7 percent of GDP, or 536.4 million dollars. Secondly, the loss of seigniorage income to the nation from the inability to print new money in the future is roughly 2.51 percent of GDP, or 360.6 million dollars over eight years. The stock and flow costs of the loss of seigniorage over the 1991-97 period, were 12.2 and 7.4 percent of GDP, respectively. Although seigniorage from paper money will be lost to the U.S., it is acknowledged that the loss will not include coinage, which the Central Bank of Ecuador will retain the power of minting and of which it will derive a small seigniorage (Baquero, 2000). The losses attributable to loss of seigniorage may be substantial and, therefore, impose constraints upon the budgetary resources of the adopting government. Calvo has suggested that the losses of seigniorage can be made up with a tax on wealth or some other tax that provides the government with revenue, while Hanke maintained that the losses are primarily offset though decreases in debt service costs and interest rates (Calvo, 2001 and Hanke, 2003).

Startup Costs

The economy of the dollarized government is saddled with the extremely high start-up costs of exchanging all domestic bills and coins into dollarized bills and coins. This high cost not only includes the actual seignorage loss mentioned

above but also includes opportunity costs such as any post-dollarization laws needed to ensure the proper functioning of the dollar economy. There also arise one-time costs associated with changing equipment such as cash registers, vending machines and computers from domestic currency to dollars. Additionally, legal contracts and refinancing agreements must be rewritten to reflect the new currency, adding to the one-time cost (Bogetic, 2000). As mentioned previously, the amount of the exchange of domestic sucres in Ecuador into U.S. dollars initially totaled 536.4 million dollars; the other costs are non-quantifiable.

THE FUTURE OF DOLLARIZATION AND ECUADOR

The list of economic benefits and costs believed to be associated with official dollarization continues to be quite extensive and the subject of great misconception. The process of dollarization does not occur in a vacuum where all things are equal; myriad other macro issues such as policy implementation and economic cycles must also be considered to fully understand the effects of dollarization. In addition to understanding the effects, there remains great disparity in the confidence of quantifiable measurements. This paper has attempted to measure, the various outcomes, both theoretically and empirically, that dollarization has had on the Ecuadorian economy since its adoption.

In light of the evidence presented in this paper, it is argued that Ecuadorian dollarization, in the short-run period of its existence, has had minimally perceptible benefits to the economic well-being of the nation beyond that of an initial stabilizing effect. Inflation, unemployment and external debt have all declined while economic growth has resumed, showing signs of economic recovery in Ecuador. However, it would be imprudent to attribute an undeserved portion of this recovery to the effects of dollarization without more extensive research into measurement of the benefits. Likewise, the costs, although somewhat more measurable than the benefits, appear also to have had a relatively minor overall impact on the economy of Ecuador. From a competitiveness standpoint, Ecuador's credit rating, access to credit, soundness of banks and growth competitiveness have all fallen, despite the argument that dollarization adds an element of stability to the domestic economy of the adopting nation. In light of these findings and the finding of other researchers, it appears to be most difficult to conclude that the dollarization of a national economy is a panacea to the monetary and political problems of extremely dysfunctional governments. Dollarization should, therefore, be adopted only after a thorough assessment and with great caution.

SUMMARY AND CONCLUSION

This paper has looked at the benefits and costs attributable to Ecuador's decision to dollarize its economy during 2000. It was shown that the benefits of dollarization are more long term in nature and quite difficult to measure; however, Ecuador was shown to have attained a degree of credibility, which translated into lower rates of domestic inflation. Ecuador has obtained increased access to foreign credit during the years immediately following dollarization. Some of the costs looked at included the loss of independent monetary policy, global competitiveness, loss of lender of last resort ability, seigniorage costs, and various other start-up costs. Seigniorage loss was the most influential of the costs, while losses of independent monetary policy and lender of last resort ability may entail few, if any, actual costs for non-credible governments, and, therefore, serve a primarily beneficial purpose. Dollarization has had minimal overall impact on Ecuador's economic and political atmosphere.

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ECONOMIC ACTION IN SOCIAL COLLECTIVITIES

Claus Nygaard, Copenhagen Business School

ABSTRACT

This paper argues that economic action is affected by the embeddedness of economic actors in social collectivities in which collective practice is institutionalised. Supporting this argument are two micro-sociological qualitative field studies of economic action of Danish subcontractors in two regions of Denmark. Based on the data-analysis a framework is constructed to explain how and why these subcontractors learn from collective practice. The explanation draws on the practice-approach of symbolic interactionism in particular. The ongoing academic debate on governance structures has focused on national and sectoral governance structures. While this paper acknowledges its important contribution to our understanding of contextual economics, its explicit micro level analysis of the role of institutionalised practice for economic action offers a set of additional and alternative explanations of economic action to recent research on governance structures. The paper has potential interest to all scholars and practitioners interested in the link between economic- and social action and to those interested in explaining issues of strategic management from a sociological point of view.

INTRODUCTION

Empirical studies pinpointing regional and national differences in industrial organisation show a demise of the idea that a certain mode of economic action can lead to competitive advantage across industries and markets (Kristensen, 1997; Kristensen & Zeitlin 2001; Lane, 1997; Morgan, 1997; Lilja, 1997; Whitley, 1994, 2001). Economic action is affected by a large variety of institutions (DiMaggio & Powell, 1983; North, 1991; Scott, 1994, 1995), which call for contextually bounded analysis of economic action. Standard neo-classical microeconomic theory, which argues that economic action is co-ordinated by the market mechanism, neglects institutions and fails to explain the empirical differences observed in economic action across different contexts. With reference to Richardson (1972: 884), who writes: "…by looking at industrial reality in terms of a sharp dichotomy between

firm and market we obtain a distorted view of how the system works", I argue that in order to understand what drives economic action in different contexts we need to do research on the embeddedness of economic actors, particularly paying attention to micro-level aspects of social regulation of economic action. This paper analyses such micro-level aspects and shows that economic action is guided and constrained by collective practice institutionalised in social collectivities in which economic actors are embedded.

The paper has four sections. Section 1 serves as a general introduction to the key terminology, and it positions the study in relation to the ongoing research on national and sectoral governance structures. Section 2 describes the methodology and the characteristics of the empirical fields. Second 3 presents empirical data, which supports the argument of the existence of social collectivities in which a collective practice is institutionalised which affects economic action. Section 4 gives possible theoretical explanations of the observed characteristics of economic action of subcontractors by modelling social dimensions of economic action.

SECTION 1: RESEARCH ON GOVERNANCE STRUCTURES

This paper studies subcontractors' embeddedness (Granovetter, 1985, 1990, 1992) in social collectivities (Greenwood, 1994) and its consequences for their economic action. According to the view of embeddedness, economic action is affected by the social context in which actors occupy a social position. Three different types of economic action are analysed:

- Subcontractors' constitution of cooperative relations with other firms (subcontractors or outsourcers).
- Subcontractors' recruitment of workers for the shop-floor.
- Subcontractors' engagement in research and development with other firms (subcontractors or outsourcers).

The explicit focus on subcontractors' embeddedness in social collectivities offers a micro-level explanation of governance structures affecting economic action. The paper adds a micro-sociological dimension to the majority of the ongoing research on governance structures, which traditionally has applied macro- and meso-level explanations of economic action/industrial organisation (Hollingsworth and Streeck, 1994; Kristensen, 1997; Lane, 1997; Lilja, 1997; Morgan, 1997; Sorge, 1996, 2000; Whitley, 1992a, 1992b, 1994). Table 1 positions my study in relation to current research on governance structures.

Table 1: Perspectives on Governance Structures				
Perspective	Business Systems	Societal Effect	Regimes of Governance	Social Collectivities
Key Author(s)	Whitley	Sorge	Hollingsworth and Streeck	Nygaard
Boundary	Business systems are mainly nationally bounded; acknowledging sectoral business systems, but arguing they are in the minority	Societies are mainly nationally bounded (due to a focus on the societal effect)	Regimes of governance are mainly nationally bounded (although described in connection to specific sectors)	The boundary of social collectivities depends on actors' internal- and external justification of institutionalised practice
Possible Constitutive Mechanisms	Business systems are mainly constituted by proximate social institutions, particularly the state	Societies are mainly constituted by societal and subject structures	Regimes of governance are mainly constituted by sectoral properties, products and product markets, modified particularly by the state	Social collectivities are mainly constituted by sets of arrangements, conventions and agreements
Suggested Type of Study	Business systems are best studied by cross-national comparative studies	Societies are best studied by cross-national comparative studies	Regimes of governance are best studied by cross-national comparative studies	Social collectivities are best studied by qualitative, micro sociological field studies
Suggested Focus	Macro Sociological	Macro Sociological	Macro Sociological	Micro Sociological

The Business System Perspective

The business system perspective aims at providing a theoretical framework for: "...comparing and contrasting the different ways of organizing economic activities which have become established in different institutional contexts and to suggest how some key characteristics are interrelated in particular business systems" (Whitley, 1994: 154). In doing so the focus is on national aspects. It is so: "...because the nation state is the dominant collectivity for organising so many of the social institutions which impinge directly on economic activities, such as the legal, education and financial system, as well as itself constituting one of the major influences on firm structure and behaviour..." (Whitley, 1992a: 37). In this perspective the national level then becomes: "...the obvious starting point for any comparative analysis of business systems" (Whitley, 1992a: 37). He suggests a macro sociological focus and the implementation of a cross-national comparative study where explanation of industrial organisation is sought. It is by comparing and contrasting governance structures in different national contexts that we gain important knowledge about business systems. Whitley writes further: "...I would argue that dominant institutions in all societies structure processes of industrialisation such that particular kinds of firms and markets become established and form a distinctive system of economic relations that reproduces itself interdependently with political etc. institutions. Given the considerable importance of the state, and of state-regulated and supported institutions, in coordinating industrial processes and maintaining social boundaries, it seems reasonable to consider market economies initially bounded by states" (Whitley, 1992b: 271). The requirement for distinctiveness and cohesiveness within the nation state stresses his view on the national demarcation of business systems, and studies of industrial organisation and governance structures using the business system perspective as their theoretical foundation are bound to take a macro sociological focus.

The Societal Effect Perspective

Sorge (1996, 2000) follows suit in his comparative research on industrial organisation using the so called societal effect approach. He argues that industrial organisation differs across contexts, even when they seem identical, and he argues for different types of division of labour within different societies: ". . . the societal effect approach argues that internationalization and universal technical change lead to different outcomes in each society, within an intensification of the international

division of labour. How this division of labour develops we can only explain if we refer to societal characteristics that are relatively stable, even in the midst of change. This change triggers development of societal specificity, rather than bringing about convergence between societies. That is also the clear message which the approach offers to all those who think that European integration will reduce the differences between individual European countries. Such a message suggests that the societal effect approach will continue to be topical and inform new research into cross-national differences" (Sorge, 1996: 84)." From this it is obvious that the societal effect perspective sees the nation as the natural boundary of society. The way in which industries organise, Sorge argues, is affected by societal structures and subject structures within nations, and cross-national comparative studies make it possible for researchers to explain what constitutes industrial organisation in different countries. At the same time, researchers have to look for relatively stable societal characteristics in order to understand industrial organisation, hence the focus is merely placed on institutional representation and inertia. In respect to the suggested type of study being cross-national comparative, and the focus being macro sociological, the societal approach perspective is indeed similar to the business system perspective and they are in no way conflicting perspectives.

The Regimes of Governance Perspective

A similar national focus to that we find in the business system perspective and the societal effect perspective is argued by Hollingsworth & Streeck (1994: 272-273): "Differences in governance within sectors are often recognizable as national differences in that they follow a similar logic across sectors... The impact of the national context makes itself felt in at least three ways... Through identical rules of behaviour created and enforced at national level... Through identical factual conditions facing all economic subjects in a given country... Through identical cultural and political resources defining the constraints and opportunities under which individual and collective subjects operate". They state the societal effect approach as their source for inspiration. Although arguing that their perspective has a sectoral focus, Hollingsworth & Streeck suggest a macro sociological focus, and they argue for the use of cross-national comparative studies when the constitution of industrial organisation has to be explained. It seems that sectors, in their governance perspective, become national entities when they argue that differences are national, and rules and behaviour are enforced at the national level. Like Whitley and Sorge, they draw their attention to the role of the state when explaining the main

constitutive mechanism affecting industrial organisation. In this way, the term "regimes of governance" equals the business system in Whitley's use of the term. To Hollingsworth and Streeck, it is most likely that only one business system is constituted within each nation, and this business system may very well be cross sectoral. It is so, they argue, because the state apparatus is the major factor affecting industrial organisation, and although industrial organisation is constituted by sectoral properties, products and product markets, such are argued to be particularly modified by the state.

All three perspectives argue that economic action is guided and constrained by the institutional context, sectoral properties, societal and subject structures, or social networks and cultures. But the perspectives do not facilitate a discussion of the particular mechanisms by which this affect takes place. The role of interacting subjects is clearly bracketed in these perspectives. In this paper I confront such macro sociological perspectives and argue that we cannot understand economic action by focusing on national institutional distinctiveness only. We also need to focus on actors' motivations and own understanding of economic action, which is why I analyse economic action in social collectivities and thereby show how embeddedness matters.

SECTION 2: METHODOLOGY AND EMPIRICAL FIELDS

Discussions and conclusions in this paper are based on findings from two empirical field studies of economic action in the Danish manufacturing industry. The main purpose of our studies was to shed light on the structures and processes governing economic action of firms in their industrial settings. 25 firms were studied in the county of Copenhagen (eastern part of Denmark), while 17 firms were studied in the county of Vejle (western part of Denmark). The respondents were randomly picked from the public register of firms in the two areas, contacted by phone and asked if they would like to participate in the study. We constructed our samples to avoid being biased by our intuition of which firms would be the most important or representative of a certain type of economic action in areas. If embeddedness is to be argued to have any effect on economic action, its' effect must appear from a randomly generated sample and not just from a sample planned due to our prior knowledge of relations between firms in the industrial areas. 35 firms were subcontractors while 7 firms were outsourcers using subcontractors themselves. In this paper the focus is on the economic action of subcontractors. Qualitative, focused interviews (Merton, Fiske & Kendall, 1990) were done with managers or managing

proprietors of all firms. Focused interviewing: "... combines unstructured interviews with a loose pattern of agreement with the interviewee about the context of enquiry" (Spender, 1989: 79). I used this particular approach as: "It gives the subject the opportunity to express himself about matters of central significance to him rather than those presumed important by the interviewer... it uncovers what is on the subject's mind, rather than his opinion of what is on the interviewer's mind..." (Merton and Kendall, 1946, cf Spender, 1989: 79). Respondents were asked to motivate various forms of economic action and reflect upon it in relation to their embeddedness. We did not pre-construct homogenous categories for the respondents to "fill out," but during our continuous dialogues we constructed scenarios from the respondents' recounting of their everyday experiences which the respondents could then relate to. All interviews were transcribed and a thematic text analysis of the consequences of embeddedness on economic action was made based on the interview transcriptions. The data analysis showed empirical evidence of collective practice among subcontractors in both regions.

In a Danish context we define small and medium sized firms as firms having 1-99 employees. The number of employees and the type of ownership of the subcontracting firms in our studies are described in Table 2.

Table 2: Characteristics of Subcontracting Firms in the Two Studie (number of employees and type of ownership)

County of Copenhagen (Eastern Denmark)				
Number of Employees	5-9	10-19	20-49	50-99
Single Proprietorship	-	1	-	-
Private Limited Company	1	2	2	-
Private Company	-	8	4	-
Number of subcontracting firms	1	11	6	0
County of Vejle (Western Denmark)				
Number of Employees	5-9	10-19	20-49	50-99
Single Proprietorship	2	3	2	-
Private Limited Company	-	3	1	-
Private Company	-	1	2	3
Number of subcontracting firms	2	7	5	3

Subcontractors vary concerning their type of activity. Two main activity types are distinguishable among subcontractors. The first type involves traditional subcontractors specialising in manufacturing processes (such as drilling, welding, laser-cutting, deep drawing, or polishing). They enter manufacturing chains to sell a specific manufacturing process to outsourcing firms. The second type is subcontractors, who have specialised in manufacturing customer specific products and thus take part in the construction and development of products or processes for outsourcing firms. Some firms in our studies combine activities in order to be competitive and earn enough money to maintain their employees in times of recession. A typical model is one which supplements the manufacturing of customer specific products with the sale of manufacturing processes, where the subcontractor makes simple processes and some construction work at the same time. Table 3 shows the number of subcontracting firms working with each activity type.

Table 3: Firms and their Activity Type

County of Copenhagen (Eastern Denmark)				
Number of Employees	129	292	20-49	50-99
Firms Selling Manufacturing Processes (time work).	1	2	4	-
Firms Manufacturing Customer Specified Products.	-	9	2	-
Firms Manufacturing their Own Brand / Product Portfolio.	-	-	-	-
Number of subcontracting firms	1	11	6	0
County of Vejle (Western Denmark)				
Number of Employees	38845	292	20-49	50-99
Firms Selling Manufacturing Processes (time work).	2	4	3	-
Firms Manufacturing Customer Specified Products.	-	3	2	3
Firms Manufacturing their Own Brand / Product Portfolio.	-	-	-	-
Number of subcontracting firms	2	7	5	3

Looking at the way in which subcontractors internally organise production and enter into flexible networks to produce a large range of outputs, I characterise the subcontractors as flexibly specialized firms. In the words of Hirst & Zeitlin (1991: 2), flexible specialization is "the manufacture of a wide and changing array of customized products using flexible, general purpose machinery and skilled, adaptable labor". Studies of various parts of Danish industry have also pictured the general business system in Denmark as a system of flexible specialization (Henriksen, 1999; Lorenzen, 1998; Lorenzen and Foss, 2003; Lorenzen & Maskell, 2004; Kristensen, 1996, 1999; Nygaard, 1999; Kristensen & Nygaard, 2000). Within such flexibly specialized production systems the philosophy of administrative bureaucracies of mass production and vertical integration has been disbanded. The Taylor-Fayol system defined as "the manufacture of standardized products in high volumes using special purpose machinery and predominantly unskilled labour" (Hirst & Zeitlin, 1991: 2) does not represent today's Danish industrial production nor the subcontracting firms studied here. The success of flexibly specialized production systems and the demise of vertically integrated bureaucracies call for an explanation of economic action alternative to the one of mass production (Piore & Sabel, 1984; Best, 1990; Pyke & Sengenberger, 1992; Sabel & Zeitlin, 1997).

SECTION 3: EMPIRICAL EMERGENCE OF SOCIAL COLLECTIVITIES

The data analysis showed that subcontractors motivate their economic action with reference to social and contextual aspects rather than to economics, resources, competitive advantage or strategic plans. At first glance they seem vague about their own strategies for economic action, as they are based on thoughts about reputation, self-worth, status, and situations that represent a hazard. Table 4 presents quotes from five interviews showing how subcontractors motivate their economic action.

Subcontractors use phrases like "in this city", "it's just the way it is", "so as not to ruin", and "somewhere up in the system". A word like "morality" stands out as a central word. This raises some interesting questions. How is "in this city" defined? Why "it's just the way it is," when no legal institutions exist to sanction different economic actions? What is it they would not like "to ruin"? How and by whom is "morality" defined? What kind of "system" is it that is referred to? Why do subcontractors tell similar stories when they justify their economic actions? Why don't subcontractors accept all the work they can get, when the business and the urge to earn money must after all be at the core of running a firm?

Table 4. Subcontractors' Motivation of Economic Action	
Quotes from Interviews	References to a Social Collectivity and Institutionalised Practice
"I cannot, in the long run, live with going about stealing their customers… I don't think that we will gain much from that. Maybe we could earn a little more money in the short run, but in the long run – no. I would be sorry to have such a reputation. So I'm serious about this. If a firm's customer has asked us to do some work for them, I have contacted the firm and told them that we have been contacted by their customer, and that we are interested in doing the work, and what is their opinion of that? Personally, I don't care, but somewhere up in the system there are people who would not be pleased about it. So we stay away from the work. Indeed it's my philosophy of business, and I believe it works in the long run – very much. And I think there are a lot of people around with this business philosophy."	"*to have such a reputation*" (self reference) "*somewhere up in the system*" (reference to significant others) "*I think there are a lot of people around with this business philosophy*" (reference to significant others)
"…in this city we have the possibility to forward drawings. They are free to see who we work for, but you do not in actuality contact them with a competitive offer. Of course, it's not [surprised laughter], yes, of course it's not something that is written somewhere. It's just the way it is [with stress].	"*in this city we have the possibility*" (social collectivity, collective "we", institutionalised practice) "*they are free to see*" (significant others, social collectivity, collective "they", institutionalised practice) "*but you do not in actuality*" (institutionalised practice) "*of course it's not something that is written somewhere*" (institutionalised practice) "*it's just the way it is*" (institutionalised practice)
"But when I say that we don't compete with each other, that's not correct. Of course we do, but not in any hard or brutal way. Often we call each other and ask: "Isn't this something you have done before?" And then one stays away, so as not to ruin things."	"*Often we call each other*" (institutionalised practice) "*so as not to ruin things*" (social collectivity)
"I have a boy who is now in training. He is the nephew of a foreman with one of our customers who asked if we needed someone. But we are very careful not to steal from others . . ." [Interviewer: That is perhaps the reason why you use the newspaper to announce openings?] "Yes, I could never dream of contacting someone. Of course if there are some who come looking for work, or will move because they are dissatisfied with being somewhere, this is	"*But we are very careful*" (self-reference) "*this hurts oneself in the long run*" (social collectivity)

Table 4. Subcontractors' Motivation of Economic Action	
Quotes from Interviews	References to a Social Collectivity and Institutionalised Practice
not something I can really get involved with. But if I advertise in the paper and there are two men who respond, where one works with one of our customers, then it will not be him I hire, even if he may be the best. I would not do that. I just think this hurts oneself in the long run."	
"Yes well, I think that most of those I have contact with, we do not see each other as competitors in that sense. There are of course always some who have some difficulty with, I had almost said "don't have a very high morality." But the majority, it is such that we see each other a bit more as colleagues. We can certainly exchange work, I have colleagues here in the city whom I can very well do some work for if they have a high workload, without my actually contacting the customer, even though in 99% of the cases I cannot avoid knowing where the end product shall go. But this is not the same as my contacting him to say that that is something I can do."	"most of those" (foreign reference) "morality" (institutionalised practice) "here in the city" (social collectivity) "not the same as my contacting him" (institutionalised practice)

Why and how do subcontractors learn the collective understanding of economic action in the system, when no formal business education or systematic dialogue about it exists? I shall come back to answering these questions in the third section of the paper. Below I will shed further light on the collective practice institutionalised in the social collectivities of which subcontractors are members. For analytical purposes, three types of economic action are selected here. The collective practice institutionalised between subcontractors regarding the three types of economic action is presented in Table 5.

Constitution of Cooperative Relations with Others

When subcontractors are engaged in cooperative relations with others they experience a focus on the means by which they gain orders. Not only their competitive advantage (e.g., related to price, time of delivery, and quality) is in focus, but also the way in which they perform economic actions in order to be competitive. They express that it is morally offensive to steal work or dump your price level to attract orders. Work can be stolen by contacting cooperative partners of others and making an offer they cannot refuse, e.g., based on a much lower price.

A subcontractor living from the ability to step in and out of multiple and highly complex manufacturing chains has much information concerning cooperative relations, technology, and tasks, which can be exploited to steal work or dump the price level. To be able to co-ordinate many processes with other firms, subcontractors have a lot of information about each other. If a subcontractor misuses this information to steal work, he is in danger of being met with negative sanctioning from others, ranging from mere warnings to exclusion from further work in manufacturing chains for which those significant others are responsible.

Table 5: Economic Action Following an Institutionalised Collective Practice

Economic Action	Institutionalised Collective Practice
Constitution of Cooperative Relations with Others	Do Not Steal Work Do Not Dump Your Price Level
Recruitment of Workers for the Shop-Floor	Do Not Steal Workers Do Not Attract Workers by Raising Salary
Research and Development with Others	Do Not Work for Competitors Do Not Forward Information, such as Drawings or Blueprints to Competitors Do Not Use Subcontractors Yourself for the Completion of an Order

Stories are told of firms that have been excluded from work on certain processes for several years, because they stole work. Subcontractors all know and tell such stories, even as third hand stories, when they justify their own economic action. Their interpretation of such stories make them phone up another subcontractor to ask for "permission" to take orders and engage in cooperative relations with others if they think that this work has previously been done by that subcontractor. Often a new customer wishing to place an order with a subcontractor will be asked why he does not use his former subcontractor anymore. Subcontractors act this way in order to be seen as good colleagues in the flexible networks of outsourcers and subcontractors.

Recruitment of Workers for the Shop Floor

Similar mechanisms are at play when subcontractors recruit workers for the shop floor. Here it is regarded as morally offensive to steal workers from others or

to attract workers by raising the salary high above market level. Being highly engaged in different manufacturing chains, subcontractors often know which processes are carried out by what workers for other subcontractors, and it is possible for them to contact the best of those workers when they need a highly qualified worker themselves for similar processes. In that way they do not have to pay for the building of a worker's competence base themselves, but can utilise it at a minimal additional expense. As subcontractors sell their manpower, production, and construction processes on an hourly basis, they are highly dependent on a flexible internal organisation to be cost efficient. If a key worker is "stolen" from the shop floor it puts the subcontractor in a critical situation, and many resources have to be spent to find the right replacement. Subcontractors often use a family metaphor to characterise the team of workers on the shop floor, which stresses their dependency on the "right man for the right machine." If a subcontractor phones up a worker and offers him a job, the subcontractor is in danger of being negatively sanctioned by others. Stories are again told of firms that have been excluded from work, because they stole workers. Subcontractors' interpretation of such stories makes them put an advertisement in the local newspaper, so that any worker can apply for the job. In doing so they show respect for others' difficulties in finding the "right man for the right machine" and express that they do not intend to "steal" workers. By symbolising this there is no problem as such for the subcontractor in actually recruiting a new worker through his personal network, because the existence of the newspaper advertisement legitimises that action. Subcontractors relate that if a new worker arrives out of the blue and asks for a job, they phone up his employer to ask if they can assign him to a vacancy. As such there are ways in which to act in order to be seen as a good colleague in the flexible network of outsourcers and subcontractors.

Research and Development with Others

Subcontractors say that it is morally offensive to work for competitors, to forward information such as drawings or blueprints to competitors, or to use subcontractors themselves for the completion of an order when engaged in research and development with others. A large firm with its' own product program does not like to use a subcontractor who also serves as subcontractor for one of their. Research and development of tools and processes is often accompanied with a contract that specifies which parties the subcontractor cannot work with. Stories are told of subcontractors who work for competitors and outsourcers and have been

commanded to immediately terminate cooperative relations with competitors in order to maintain the commanding firm as their customer. If the subcontractor has 4 workers who carry out three main processes on 6 machines, and every process takes from 2-3 minutes on each product, they need a lot of orders to fulfil their quota. To be competitive on price they have to work within normal working hours, as workers unions require extra pay per extra hours. If a subcontractor cannot complete an order within the agreed time it is more cost efficient for him to use subcontractors to "put out the fire" and complete the order. That may be considered morally offensive, just as it is to forward outsourcers' drawings or blueprints to other subcontractors. They all know stories of firms that have been excluded from work due to such instances of "illegal" subcontracting. Subcontractors' interpretations of such stories make them pen contracts and say "no" to certain orders to be seen as good colleagues in the flexible network of outsourcers and subcontractors.

SECTION 4: MODELLING SOCIAL DIMENSIONS OF ECONOMIC ACTION

Looking at the above examples, a collective practice appears to exist among subcontractors. When they justify their economic action they refer to a collective practice. Now, what is collective practice, and how does it come to play such a role in economic action? I shall turn to a theoretical discussion of collective practice, social collectivities, institutions, and identity projects, mediated by symbolic interactionism in particular, in order to find the possible answers.

Collective Practice

Collective practice is a practice shared by two or more persons. To share something means that an agreement of understanding exists. Following Selznick (1992) and Greenwood (1988), it can be argued that collective practice is practice institutionalised in a social collectivity. Institutionalisation has been defined "...to infuse with value beyond the technical requirements of the task at hand" (Selznick, 1992: 233). Not only is the immediate solution of a problem at play, such as carrying out a production process for a customer. The infused "values beyond" express this. Subcontractors' interpretation of "values beyond" is clearly expressed in the stories and scenarios they tell when they justify their economic action. They find some types of economic action to be morally offensive, which shows the

presence of an institutionalised collective practice. There exists an agreement of understanding regarding economic action which can be referred to. Taking into consideration such institutionalised collective practice an institutional identity is shaped, and thereby an ideal of social collectivity in which the modes of social integration have shifted towards common personal values rather than following merely personal goals (Selznick, 1992). This is not to say that persons have no goals, but it emphasises the importance of the impact of consensus in social collectivities regarding symbols attached to certain acts.

Not all actors assign the same symbols to economic action, of course. However, there has to exist some consensus regarding the meaning of symbols (Shibutani, 1986) if people have to be able to fit together their lines of action (Blumer, 1969). This consensus is connected to the collective practice institutionalised in social collectivities. In the social collectivity of subcontractors, specific conventions and agreements are assigned to economic action such as "engaging in new cooperative relations" and "employing a new worker," as we saw in table 4.

Social collectivities are "those populations whose members are parties to sets of arrangements, conventions, and agreements governing their behaviour" (Greenwood, 1994:37). Social collectivities are different from mere aggregate social groups where no arrangements, conventions, and agreements have been defined. According to Greenwood (1994), social collectivities:

- Specify status elevation and reversal.
- Provide possible and progressive routes for the management of reputation and self-worth.
- Do define situations that represent hazards to them.

These mechanisms make it possible for members to reconstitute arrangements, conventions, and agreements in the social collectivities. Having institutionalised sets of arrangements, conventions, and agreements, it is also necessary to specify collective practices leading to status elevation, reputation, self-worth, and the level of hazard within the social collectivity. Mechanisms for inclusion and exclusion of social collectivities have to exist. Otherwise it would be impossible for persons to judge their own membership of social collectivities or the membership of significant others, just as it would be impossible for the social collectivity to maintain itself as a social collectivity. Although subcontractors fear negative sanctioning if they engage in morally offensive economic action, which can result in termination of cooperative relations, collective practice is not a fixed

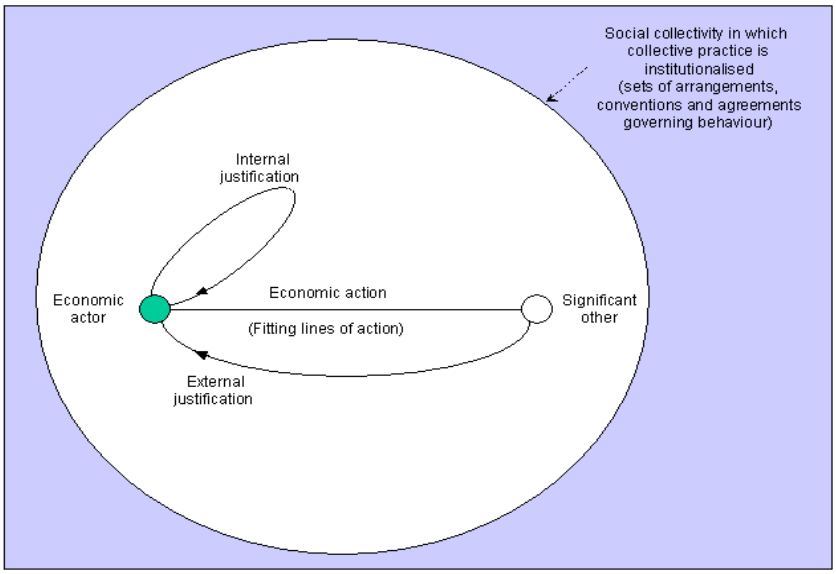
structure which has and will stay the same over time. Collective practice constrains and enables economic action, but it can be deviated from. Economic action is a personal choice of the subcontractor, although he exposes himself to sanctioning, may that be negative or positive, whenever carrying out economic action within a social collectivity. In that way the formation processes of social collectivities go on over time.

Institutionalisation of Collective Practice

In an attempt to understand why and how collective practice is constituted and further institutionalised and shared by several persons, the perspective of symbolic interactionism is beneficial, where meaning is described as a social product. To be social, meaning has to be shared or constituted by more than one person. According to Blumer (1969), people create a subjective objectivation of reality through symbolic interaction with others; hence meaning is not based on self-interaction or personal experience only, but is constructed through interaction with others as well. In this perspective, personal experience itself is a product of self-interaction and interaction with others. Although subjective to people, meaning arises from symbolic interaction with others, and positioning the one's lines of action to fit other's demands an ongoing social construction of meaning. If people do not construct meaning socially they cannot fit their lines of action to others'. A subcontractor stepping in and out of multiple manufacturing chains will find it essential that meaning is socially constructed in interaction with others. To complete his tasks, the subcontractor has to know and understand his role in the manufacturing chain, and his customer has to know and understand his own need for subcontracting in order to put out the order to the right subcontractor with the right competencies. Meaning is situational and always constructed anew, even in cases of pre-established and repetitive joint action.

Because significant others socially construct a meaning of subcontractors' economic action, subcontractors have to take into consideration the way in which economic action appears to others. The process of construction of meaning or personal experience through self-interaction and interaction with others points to the existence of the mechanisms I have previously labelled internal and external justification of action (Nygaard, 1999). Figure 1 illustrates the consequences of these justification processes for subcontractors' economic action, and shows what can be termed *social dimensions of economic action*.

Figure 1: Social Dimensions of Economic Action



External Justification of Action

The processes of external justification can be seen when others are aware of subcontractors' economic action and give it importance by assigning a name to it. The name transforms economic action into a social object with certain symbols assigned to it. The symbols can be publicly discussed and determine whether others positively or negatively sanction economic action. Economic action is the basis for symbolic interaction with others. Subcontractors' engage in economic action and others read symbols into it. If the symbol "stealing of work" is assigned to the economic action "constituting a new cooperative relation" or the symbol "stealing of worker" is assigned to the economic action "employing a new worker" the sanctioning is most probably negative and damages the reputation of the subcontractor, or worse, results in a termination of a cooperative relation or exclusion from further cooperative relations with one or several significant others. As figure 1 illustrates, the subcontractor engages in symbolic interaction with others

based on his economic action. The external justification of economic action is based upon and institutionalises further collective practice.

Due to the mechanism of external justification, the subcontractor does not engage in whatever cooperative relation is being proposed. He ascribes a sense of meaning to a possible engagement in a cooperative relation, which is done regarding to his position in the social collectivity; adjusting his economic action to the "values beyond" institutionalised in the social collectivity. This institutionalisation of "values beyond" was shown empirically, as subcontractors do not automatically accept working for others, even if they have the free capacity to do so and would benefit economically. They will reflect upon how that cooperative relation affects their reputation in the social collectivity of subcontractors. That is the reason why subcontractors may phone up others to ask for their interpretation of the symbols they attach to and read into certain instances of possible economic action. By doing so, economic action undergoes an external justification and helps create the personal identity project of subcontractors.

Subcontractors' personal identity project is affected by the external justification, stemming from the symbolic interaction when lines of action are fit together with those of others in the social collectivity. If a subcontractor who acts according to his subjective meaning is negatively sanctioned and loses his cooperative relations, his "mis-fitting" of lines of action tells him that the symbols he attached to his economic action were not seen in the same way by others, and not done according to the institutionalised collective practice. It also tells him that he does not have the personal identity (when justified by others) he thought he had.

Reflected empirically, the meaning for the subcontractor in entering into a cooperative relation may well be one, while others may see another, that of "stealing work." In this way meaning is a social product, and the subcontractor cannot be sure if he has really "stolen the work" until he becomes aware of the sanctioning by others. As such, meaning is social, constructed, and verified through symbolic interaction.

Economic action is closely connected to subcontractors' sense of identity, which is in turn affected by their membership of different social collectivities. Belonging to a social collectivity makes it possible for the subcontractor to engage in his own identity project (Greenwood, 1994). The collective practice institutionalised in the social collectivity makes it possible for him to attach a meaning to his economic action (Blumer, 1969), according to the way in which it is sanctioned by the members of the social collectivity. As proposed by Blumer (1969), economic action is sanctioned on the basis of the symbols that members of

the social collectivity socially construct and attach to it. Subcontractors phoning up others to ask if taking this or that work will interfere with their present cooperative relation is also a way to symbolise that they do not intend to steal work from others, and a way to strategize according to the institutionalised collective practice.

Internal Justification of Action

When subcontractors engage in economic action, they create their own personal identity project. The subcontractor may accept an order, because he find it is the right job to do, based on his technology and workers. In this way he sees himself as a qualified subcontractor concerning certain processes. The mechanisms of internal justification and the personal identity project emerge from the meaning of economic action socially constructed by the subcontractor.

Mead (1937) argues that people create their self / meaning by taking the attitude of significant others, seeing themselves through the others' eyes. This is what I label their personal identity projects with reference to Greenwood (1994). That is what subcontractors do when they argue what economic action is morally offensive in the social collectivity. They see their own economic action reflected in the eyes of others, and as such they socially construct their personal identity in respect to the way in which they believe it is in accordance with the view held by significant others in the social collectivity. That process of taking the attitude of others is an internal justification process that does not require economic action to be externally justified. The attitude of the other is taken before economic action, as a way to internally justify economic action when it is actually carried out. Before (and during) economic action, the subcontractor can objectify himself as a significant other, making it possible for him to construct the meaning of the symbols of his economic action, in accordance with the consensus of the collective practice institutionalised in the social collectivity. This process also becomes obvious when subcontractors internally justify their economic action because it has not led them to be negatively sanctioned by members of the social collectivity. With empirical references they are able to tell about morally offensive economic action which is based on their own internal justification of economic action. "If someone did this to me, I would find it morally offensive, so I had better not do so to him." A consensus of collective practice in the social collectivity helps this process of identity creation and internal justification of further economic action, while at the same time economic action according to collective practice leads to external justification by the members of the social collectivity. When asked, subcontractors have a clear-cut gut

feeling concerning which economic actions are positively and negatively sanctioned. That feeling is obtained by seeing themselves as significant others, and additionally by having their personal identity project affected by being sanctioned by others.

My argument is not that subcontractors spend their valuable time sitting behind their desk being philosophical, but in their identity projects they have concerns about their reputation, they feel a sense of honour and dignity, and they assess their own self-worth (Greenwood, 1994).

The personal identity project of every subcontractor may well be an unconscious or tacit process that is rarely or never reflected upon by the subcontractor himself with the labelling "personal identity project". However, it is obvious that the subcontractor has to sell his processes to others, and seeing himself as the "best subcontractor for laser-cutting in stainless steel" does not attract orders. If the quality of raw materials, price, time of delivery, and design is out-competed by others, or if the subcontractor seen upon as unreliable due to prior instances of negative sanctioning having badly affected his reputation, the subcontractor is no longer the "best subcontractor for laser-cutting in stainless steel." From this it is obvious that even if personal identity is ascribed to individuals, personal identity creation is not individual, but social. Following Greenwood, personal identity cannot be created by internal justification only.

Were there no external justification of economic action, the person could not carry out his identity project. Therefore the subcontractor creates a sense of identity by belonging to the social collectivity of subcontractors, where status elevation, management of reputation, management of self-worth, and definition of hazards are specified (Greenwood, 1994). Some situations are defined as representing hazards to the members of the social collectivity of subcontractors, such as "stealing work", "stealing workers", "increasing wages", and "dumping prices".

The flexibility stemming from decisional capabilities, teamwork, and manufacturing capabilities which define the nature of the firm, can be said to be progressive routes for the management of reputation and self-worth. Dignity is made empirically explicit when some subcontractors express they do not engage in certain economic action as it would be against the collective practice, such as "stealing of workers" from others or "working for competitors." The sense of honour is made empirically explicit when subcontractors help each other by quickly stepping into manufacturing chains and "putting out fires," and when they refuse to steal work from others for whom they subcontract, even though they often know their customers and could make an offer they could not refuse. The sense of reputation is made empirically explicit when the craftsmanship and the way in which one is

looked upon by others (as a good subcontractor not acting in a morally offensive way) are put up as central aspects in order to market oneself in the social collectivity of subcontractors.

In this way, the mechanisms of internal- and external justification are interrelated, entangled, and help explain why and how subcontractors learn from collective practice. They need to in order to create a sense of meaning and maintain their own personal identity project.

FURTHER REFLECTIONS AND UNSOLVED MYSTERIES

Why do subcontractors experience being a part of a certain social collectivity of subcontractors? In the situation of not having all resources at hand themselves, they know that they are dependent on other subcontractors for their own survival. They know that they themselves use colleagues (rather than competitors) when placing orders, and they know that they judge whether other subcontractors are colleagues or competitors due to their reputation. A reputation earned due to craftsmanship, flexibility, price, quality, delivery time - and maybe more important, due to the fact that the colleague is satisfied with his role as a colleague and does not strive to be a competitor. With the high degree of inter-firm relations between subcontractors, the potentially opportunistic subcontractor may think twice before he "steals" work or workers from another subcontractor. If his actions offend, the subcontractor puts himself in a position where further cooperative relations with others may be at risk due to the possible negative sanctioning by other members of the social collectivity. The emphasis on values rather than goals (Selznick, 1992) is institutionalised in the social collectivity, which exemplifies the sense of a social collectivity (Greenwood, 1994; Selznick, 1992). The membership of social collectivities constrains and guides economic action, and importantly, it enables subcontractors to carry through identity projects (Greenwood, 1994; Mead, 1937).

Reflecting upon the matter of time-invariance it is impossible to say how long collective practice institutionalised in the social collectivity of subcontractors stays the same. What is perceived by subcontractors to be "illegal" and "legal" economic action may well change over time. Nevertheless, I think a time-invariance exists where collective practice is institutionalised, creating a sense of consensus about how to do in the social collectivity of subcontractors. Otherwise I do not think I would have heard such similar stories and explanations of economic action from the subcontractors I interviewed. At the end of the day they all own a unique firm competing for orders in the market. Obviously, the economic conjuncture seems to

play a role for economic action. Subcontractors relate that there is a tendency that some steal workers, steal work, do illegal work, dump prices, and the like – in times when competition gets rough. It may well be that a hard economic decline will lead to a general shift in the beliefs, principles, and commitments governing economic action, helping to institutionalise a new collective practice, just as an increase of the economy or an introduction of a major breakthrough technology may do the same.

Returning to figure 1, an obvious question that still needs further clarification is, whether it is the internal or the external justification processes which affect personal identity projects the most. It is an empirically based question that cannot be answered theoretically. Aspects of power relations between subcontractors and significant others play a role, as do social positions of subcontractors vis-à-vis significant others when economic action is justified, which I have argued and shown elsewhere (Nygaard, 1997, 1999). I cannot judge when the social collectivity is to change, neither has it been my intention to do so. Instead I have discussed theoretical aspects behind the constitution of collective practice and its' institutionalisation, which led me to create figure 1 and draw the following conclusions.

CONCLUSION

This paper has reported the results of two empirical field studies of economic action of subcontractors in the Danish manufacturing industry. It has taken a particular micro sociological point of departure to show different micro-level structures and processes governing economic action. With its explicit focus on actors' motivations and own understanding of economic action, this paper has refined macro sociological perspectives such as the Business System perspective (Whitley, 1992a, 1992b, 1994, 2001), the Societal Effect perspective (Sorge, 1996, 2000), and the Regimes of Governance perspective (Hollingsworth and Streeck, 1994) clearly brackets the role of interacting subjects.

Three different types of economic action have been analysed:

1) subcontractors' constitution of cooperative relations with other firms (subcontractors or outsourcers).
2) subcontractors' recruitment of workers for the shop-floor.
3) subcontractors' engagement in research and development with other firms (subcontractors or outsourcers).

The empirical findings show an institutionalised collective practice among subcontractors, indicating the existence of a social collectivity. Overall, competition between subcontractors for cooperative relations is constituted by and institutionalises collective practice in the social collectivities of which subcontractors are members. Subcontractors have to be aware of the institutionalised collective practice of being able to act according to the sets of arrangements, conventions and agreements. Economic action to reach some ends is decided upon during a process of internal justification. The subcontractor justifies his economic action to himself, which may be "engaging in a new cooperative relation by phoning up a firm to ask if they have some work for me to do." At the same time, economic action is externally justified by others, who read symbols into it, which may be "now he phones up my customer to steal my work." I have argued that collective practice enforces a sense of social collectivity among subcontractors, in which there is a consensus of certain particularities about economic action. Based on symbolic interaction and peer group sanctioning, subcontractors constitute their identity projects and attach further meaning to their own economic action, making them capable of constituting and maintaining cooperative relations on the basis of which they earn a living. As such, competitive advantage follows from the ability to learn from collective practice. With the concepts of internal- and external justification, I have focused on some of the possible micro-level processes underlying economic action and I have shown how embeddedness matters.

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