

# Macro Measures And Mechanics of Social Capital

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## Abstract

Interest in social capital has grown as it has become apparent that it is an important predictor of collective well-being. Recently, however, attention has shifted to how levels of social capital have changed over time. But focusing on how a society moves from one level of social capital to another over time requires better macro level measures. Better measures are required to test even basic hypotheses such as the establishing the direction of causality between the two components of social capital.

In the following analysis, I develop macro measures of social capital through the development of longitudinal measures of civic engagement and interpersonal trust. I, then, use these measures to test a basic assumption about social capital. I, first, perform a direction of causality test to substantiate the causal direction between the two components of social capital. Second, I model civic engagement as a function of the time and monetary-related resources required for civic participation and interpersonal trust as a function of long term trends in civic engagement and a set of controls for collective experiences. The result is more than just the first over time measures of social capital, but also an increase in our understanding of social capital as a macro process with complex causes and effects.

# 1 Introduction

Political communities must invariably confront collective action problems. Communities that act collectively are able to achieve common goals, while communities that are unable to cooperate are doomed to inaction. We frequently observe in daily life the results of a community's ability to overcome collective action problems. Some communities function and do so efficiently: the trash is picked up, the schools are safe, and the buses run on time; while in other communities, potholes go unfilled, the street lamps are dark, and trash sits on the corner.

Why do communities have such differing capacities to engage in collective action? Scholars have developed the concept of "social capital" to explain the varying ability of communities to act collectively. Social capital refers to the civic participation and to trusting and cooperative attitudes in a community (Brehm and Rahn, 1997; Coleman, 1998; Fukuyama, 1995; Putnam, 1995*a,b*, 2000).<sup>1</sup> Communities with high levels of social capital have both extensive civic networks with high levels of community participation and high levels of trusting attitudes.<sup>2</sup> Social capital appears to be an important predictor of indicators of collective well-being such as economic development, educational attainment, confidence in political institutions, lower crime rates and government performance (Brehm and Rahn, 1997; Coleman, 1998; Fukuyama, 1995; Knack, 2002; Putnam, 1995*a*, 2000)

More recently, attention has shifted to how levels of social capital have changed over time. One of the important contributions of later research has been to study a possible decline in a variety of indicators of social capital in the U.S. (Costa and Kahn, 2001; Paxton, 1999; Putnam, 1995*a,b*, 2000). But focusing on how a society moves from one level of social capital to another over time requires better macro measurement of social capital. Current analyses of the decline of social capital relies not on an over-time index of social

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<sup>1</sup>Coleman's conception of social capital differs in important ways from Putnam's, relying more on individual help networks than civic participation. The work here focuses on Putnam's definition.

<sup>2</sup>The connection between social capital and collective action developed as research highlighted the association between social capital and collective action in different regions of Italy (Putnam, 1993).

capital, but on inspection and analysis of a wide variety of disparate trends in empirical indicators, such as club memberships, voting, attendance at public meetings, volunteering, time spent visiting friends, whether one trusts strangers, and other survey items. While such evidence may connote a general decline, it is also possible that only particular indicators are declining, whereas others might have moved not at all or even in the opposite direction. If social capital is an empirical phenomenon with multiple indicators, we should be able to solve for and observe the common social capital dimension over time. Moreover, unified measures of social capital will also allow for tests of how movement in social capital over time affects political and societal phenomena. The task at hand, then, is the construction of unified macro measures of social capital for use in testing hypotheses about the effects of change in social capital over time.

## 2 Building a Measure of Social Capital

Social capital is the concept. It is an aggregate property of societies, and we suspect that it changes over time. In particular, we suspect that it is declining and that the decline affects a variety of social and political outcomes. But other than glimpses seen through isolated indicators, we have never really seen social capital. We do not know whether there is an “it” or whether social capital is a set of trends that are unconnected beyond the association apparent in a visual inspection. We have a concept, but we want more than a concept; we want an empirical measure that exemplifies the concept. In this section, I develop empirical measures of social capital in the form of time series measures of civic engagement and interpersonal trust.<sup>3</sup> After an examination of the raw materials that comprise social capital, I use a well-know method to construct a measure of social capital.

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<sup>3</sup>At least three approaches have been taken in the measurement of social capital. In one approach, social capital is measured by taking a census of civic groups and group memberships. In the second approach, social capital is measured with survey data on levels of trust and civic engagement. The third approach is to use changes in market valuations before and after takeover offers (Fukuyama, 2000). Fukuyama (2000) discusses the shortcomings of the first approach. The third approach is designed to measure social capital within private firms and is impractical for constructing an aggregate measure. I pursue the second approach for developing a measure of social capital.

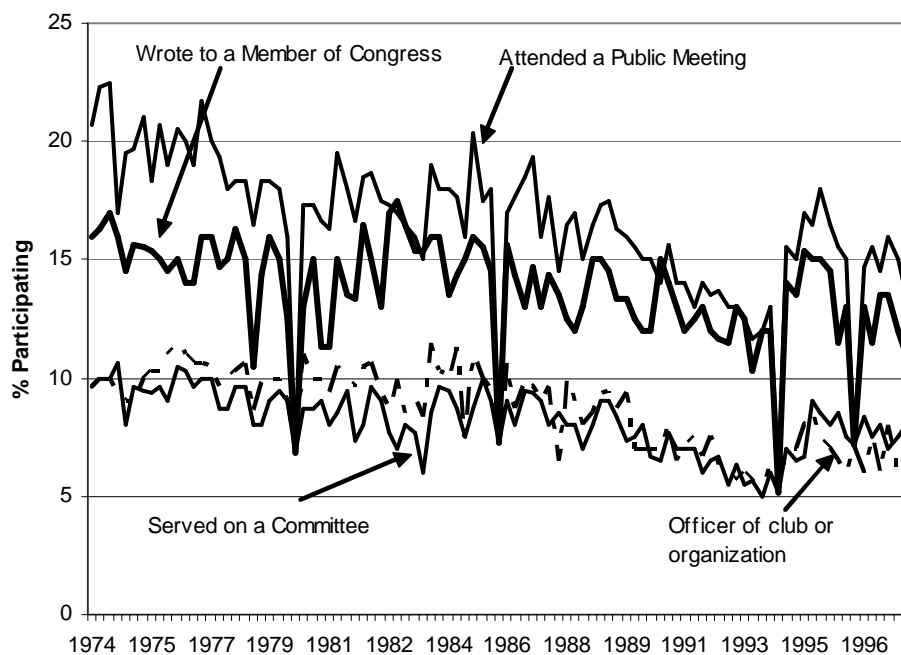
The raw data are survey marginals, the percentages of responses to survey questions. The cases will be each time a survey item is measured, and the goal is to build a regular time series from repeated survey items. Of course, most survey items don't form anything like a regular time series. Survey questions are asked when pollsters feel like asking them or when events make a question pertinent. To assess what information is available, the first task is to build a database that contains survey marginals grouped by question wording and ordered by time.

For a survey item to be included in the analysis, it must meet two criteria. First the survey item must measure some aspect of either civic participation or interpersonal trust. Second, the survey item must also be repeated in identical form at least once; a single shot item gives no leverage on assessing over time change. The next question is what type of survey questions are indicators of social capital and thus deserve inclusion in the measure? To guide the data collection, I collected survey items that were identical or similar to the types of civic engagement used in Putnam's measure of social capital. This ensures comparability between the longitudinal measure, here, and Putnam's aggregate measure of social capital. Consequently, the measure includes indicators of four types of civic participation: participation in community organizations, participation in politics and public affairs, volunteering, and informal socializing (Putnam, 2000). The National Election Studies (NES) ask three questions designed to assess a respondent's level of interpersonal trust, which were used as a guide for the collection of survey items that measure interpersonal trust. The data come from two sources: the archives at the Roper Center for Public Opinion and the DBB Needham Lifestyles surveys. The reader should note that the data from the Roper Center is more than data collected by the Roper Center. The Roper Center archives survey data from a wide variety of commercial polling organizations such as Gallup, *The New York Times*, *ABC/Wall Street Journal* just to name a few, and I rely extensively on this commercially collected data to build the measures of social capital. This is especially true for the measure of interpersonal trust. While the question wording for the items in the interpersonal mea-

sure come from NES and GSS, the items used to build the measure also come from several commercial polling organizations that have also used these survey items.

It is useful, at the start, to develop some intuition of the raw indicators of social capital. I start with some of the Roper data. Figure 1 contains a subset of the civic participation items from Roper. Two of the questions tap involvement with community organizations as respondents are asked whether they have served on a committee of a local organization or been an officer of a club or local organization. The other two questions are indicators of involvement with public affairs. One of the survey items tracks the percentage of respondents that write to a member of Congress, and the other asks whether the respondent has attended a public meeting. Even with the naked eye, one can see how well the series track together over time. All four types of participation exhibit what appear to be seasonal patterns and decline modestly over the last twenty years.<sup>4</sup>

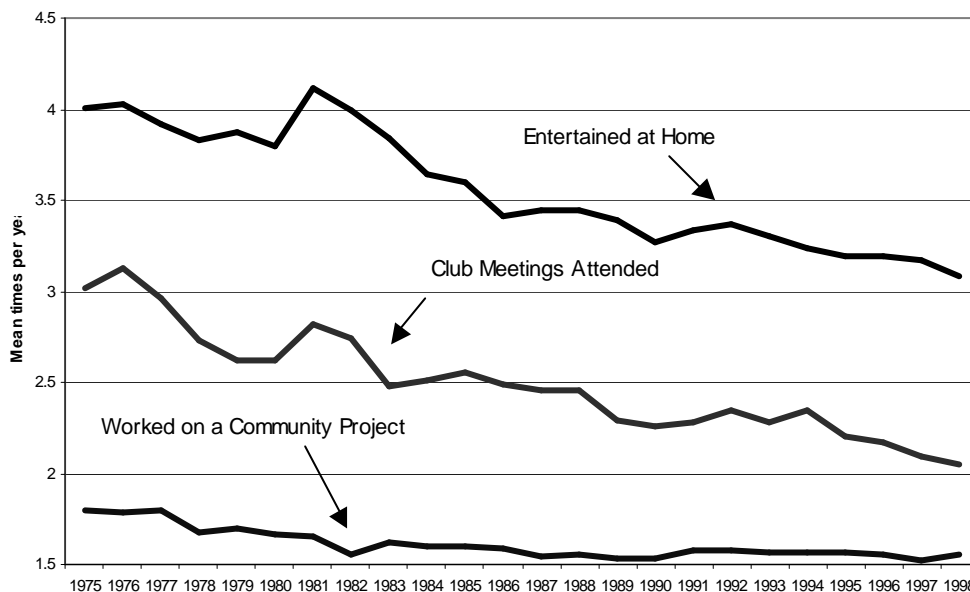
FIGURE 1: Indicators of Social Capital: Roper Participation Trends



<sup>4</sup>Roper asks several other questions that could be construed as relating to civic engagement. Putnam, however, does not include these in his measure of social capital since, as my analysis confirms, these additional items do not scale well with the other measures of civic engagement.

The DBB Needham Lifestyles survey provides us with another set of civic participation items for comparison. Figure 2 shows the over time trends of working on a community project, attending a club meeting or entertaining at home. A visual inspection provides little evidence of association other than a modest decline or similar movements in spots.

FIGURE 2: DBB Needham Indicators of Social Capital: Civic Participation



Such visual association is the present state of macro level social capital measurement theory. While the naked eye might assume a common dimension underlies the patterns seen here, without solving for that common dimension, we lack any confidence in the patterns the eye discerns. Moreover, other survey items are available but do not recur at a frequency that makes visual inspection useful. The goal, here, is to construct measures of social capital that capture the two dimensions of civic participation and interpersonal trust. However, constructing measures of social capital is more difficult than merely averaging across each series for every time point given the uneven administration of the survey items.

To aggregate the data into two time series of interpersonal trust and civic engagement, I use Stimson’s (1999) ”recursive dyadic dominance method” for constructing a time series from survey marginals. Stimson’s modeling process (which he invented to estimate “public

mood”) is designed to solve the missing values problem associated with most time series of public opinion poll data and to identify the shared movement over time across different public opinion time series. His method allows me to combine data from a variety of surveys and survey organizations to create the first quarterly measures of social capital. His method also uses an exponential smoothing model to decrease the amount of fluctuation due to sampling. Moreover, the communality between each series of survey marginals and the estimated social capital series is updated until the two communalities are effectively zero. Finally, a principal components analog in the method allows the analyst to assess whether a set of indicators measure the underlying latent construct. The principal components analog produces a loading-interpretable as a correlation-between the indictator (here a set of survey marginals over time) and the latent construct. If a series of survey marginals measure the underlying construct, they will produce a high loading. However, unlike most principal component analyses, the approach is inherently confirmatory. Stimson’s method has been widely used to construct time series measures of public opinion (Chanley, Rudolph and Rahn, 2000; Durr, Gilmour and Wolbrecht, 1997; Durr, Martin and Wolbrecht, 1993; Freeman et al., 1998; Kellstedt, 2000).

In keeping with the confirmatory approach of the method I, first, estimate a separate civic engagement series composed of over twenty indicators and one thousand survey marginals. The resulting measure is a quarterly civic engagement time series, scaled from 0 to 100 with higher values indicating higher levels of civic engagement for the period 1972:2 to 2000:4 and is displayed in Figure 3.

Civic engagement exhibits little short-term movement but has steadily declined during the period under observation. Without a longer time frame, it is hard to judge whether the decline is moderate or steep, but civic engagement did drop over six points. I, next, examine the results from the principal components analog that estimates whether the indicators tap the underlying construct. The analog produces a loading—interpretable as a correlation—between the indicator and the underlying dimension.

Figure 3: Civic Engagement, 1972:3-2000:2

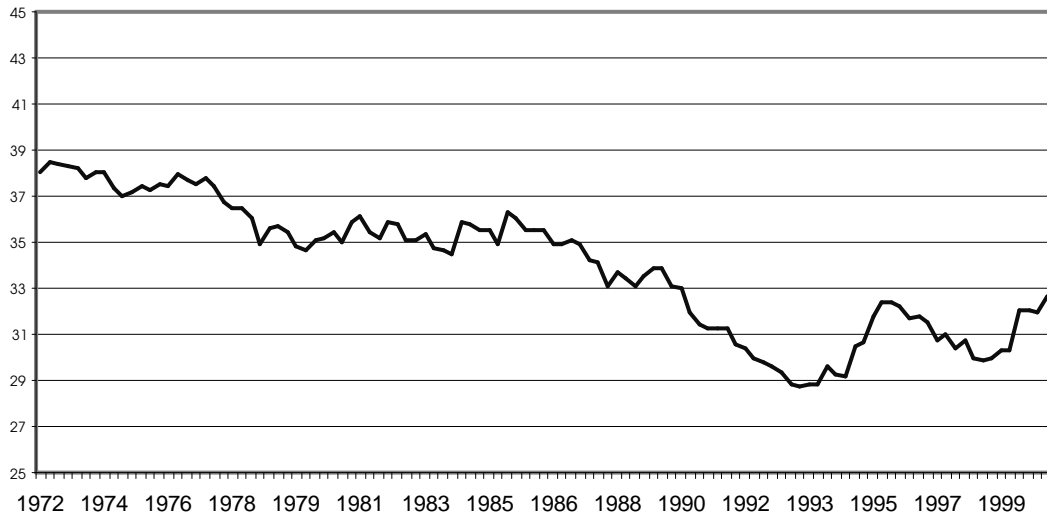


Table 1 contains the loadings for the civic engagement items. To ensure that we have a valid measure of civic engagement, we need an index where a broad set of indicators produce high loadings. Here, we have exactly that. Every item loads well on the underlying construct. This is, in fact, surprising, given that the indicators tap a broad range of civic activities. Despite, the broad range of the indicators most of the items loading above 0.6 and many of the loadings are above 0.8. The index explains 62 percent of the variance in the indicators collectively, which indicates exceptional model fit. The empirical results allow me to be confident that the this set of indicators form a valid and reliable measure of the over time movement of civic engagement. Moreover, we now have a measure for use in later analyses.

Next, I estimate the interpersonal trust time series, also scaled from 0 to 100 for the same time period. The series is displayed in Figure 4. Unlike civic engagement, interpersonal trust fluctuates frequently. Like civic engagement, however, interpersonal trust has also declined over the last thirty years. In fact, interpersonal trust has dropped nearly twenty points during the time span here.<sup>5</sup> The largest decline in the series is in 1972, while a large upswing occurs in the mid-1990's.

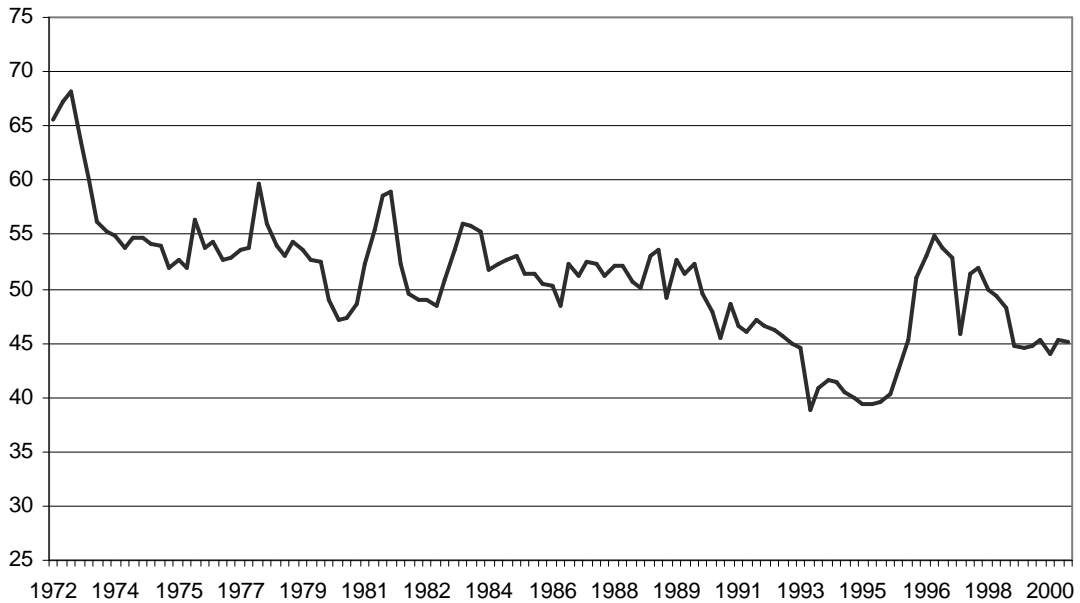
<sup>5</sup>Stimson's method rescales the resulting measure to match that of the item that occurs most frequently in the data. As such, the scales between civic engagement are not directly comparable.

Table 1: Loadings Between Civic Engagement Indicators and Overall Index

Survey Item	Civic Participation
Served on a Committee	.84
Officer of an Organization 1	.91
Officer of an Organization 2	.87
Club Meetings Attended	.84
Membership in a Group	.85
Attended a Public Meeting	.89
Wrote to Congress Person	.67
Wrote or Called Politician	.57
Worked on a Community Project	.63
Did Volunteer Work 1	.46
Did Volunteer Work 2	1.00
Did Volunteer Work 3	1.00
Did Volunteer Work 4	.88
Did Volunteer Work 5	.54
Volunteer at Church1	.81
Volunteer at Church 2	.41
Volunteer in Politics	1.00
Volunteer for the Environment 1	.66
Volunteer for the Environment 2	.79
Time Spent Visiting Friends	.60
Times Entertained at Home	.81
First Eigenvalue Estimate	12.4
% Variance Explained	62

Note: Principal components analog loadings.  
Survey items that only occur twice load at 1.0, 0, or -1.0 by definition in the principal components analog.

Figure 4: Interpersonal Trust 1972:2-2000:4



Civic engagement and interpersonal trust do appear to have some common variation as both declined noticeably in the early 1990's. But while both experience noticeable drops, the declines are timed differently. The decline in civic engagement starts earlier than that of interpersonal trust, approximately in 1990, followed by a large increase in 1994. The decline in trust, however, does not begin until late 1992 and does not rebound until 1996.

Table 2 contains the loadings for the interpersonal trust indicators. The loadings, here, are even better than those for civic engagement. The lowest loading for the interpersonal trust items is a high 0.62 with the rest of the indicators loading at 0.84 or higher. Here, the index explains 68% of the variance in the indicators, thus, forming a reliable measure of interpersonal trust. By all indications, the interpersonal trust measurement model has exceptional fit, which implies that we can be confident that we have a measure that is more than sufficient for analyzing social capital.

Both measures proved to be robust to the removal of indicators, that is the loadings did not fluctuate significantly when various indicators were dropped from each measurement

Table 2: Loadings Between Interpersonal Trust Indicators and Overall Index

Survey Item	Interpersonal Trust
Trust Item 1	.84
Trust Item 2	1.00
Trust Item 3	.62
Trust Item 4	.92
First Eigenvalue Estimate	2.7
% Variance Explained	68

Note: Principal components analog loadings  
Survey items that only occur twice load at 1.0, 0, or -1.0 by definition in the principal components analog.

model. I also estimated one model where the trust items were included with the civic engagement items. Here, the trust items loaded poorly on the underlying construct, and the overall fit of the measurement model suffered.<sup>6</sup> Given that I, now, have longitudinal measures of social capital suitable for empirical analysis, I, next, test some basic theoretical propositions about social capital.

### 3 A Causal Framework

Macro measures of social capital allows me to explore some basic questions about the nature of social capital. While we might assume that civic engagement and interpersonal trust are associated, it is unclear what the macro level causal process between them is. At the micro level, the evidence suggests reciprocal causality (Brehm and Rahn, 1997), but it is possible that is not the case at the macro level. Therefore, I present the evidence for two theoretically crucial questions about social capital: (1) Does civic engagement shape the

<sup>6</sup>Stimson’s method allows the analyst the option of extracting a second dimension from a set of indicators. I tried this for all the items as a whole, but since his method requires the second dimension to be orthogonal to the first, the results were incoherent, since as we would expect, the dimensions of trust and civic engagement are correlated, but not the same dimension. I also attempted to extract a separate dimension for civic engagement, but the eigenvalue of the second dimension was well below 1.

over time movement of interpersonal trust? (2) Is interpersonal trust a proximate cause of civic engagement or is the effect of interpersonal trust static and thus unrelated to the over time movement of civic engagement? To answer these questions, I use a standard analytic technique for tests of causal direction at the macro level, the Granger causality test (Freeman, 1983; Freeman, Williams and min Lin, 1989).<sup>7</sup>

While the causal mechanics, here, are subtle, the test is simple. A standard partial F-test is used to determine whether past values of one series affect subsequent values of another series. I perform two Granger tests. The first is a test of whether civic engagement Granger causes interpersonal trust, and the second, is a test of whether interpersonal trust Granger causes civic engagement. For the first Granger test, if the null succeeds, we infer that civic engagement Granger causes interpersonal trust. Under the second Granger test, if the null succeeds, we infer that interpersonal trust Granger causes civic engagement.<sup>8</sup>

The results appear in Table 3. Each cell in the table represents an estimated equation. The  $p$ -values associated with each equation appear in the cells of the table. The first test is whether interpersonal trust has any effect on civic engagement, I estimate with a  $p$ -value of .14 that it *does not*. Thus we can infer that exogenous shocks to interpersonal trust will not affect the overtime movement of civic engagement. So were we to witness a wholesale decline or surge in interpersonal trust, a society's level of civic activity should be unaffected. For example, if the events of September 11<sup>th</sup> were to bolster citizens' interpersonal trust, we should not expect any new increase in civic engagement to result from this shock to trust.

I also test whether civic engagement affects the over time movement of trust, and estimate with .00 likelihood that civic engagement *does not* affect interpersonal trust. The statistical

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<sup>7</sup>Any time series analyst must deal with the preliminaries of the lag structure and issues of co-integration. In a Granger causality test if both series are integrated, the distributions become non-standard and the analyst cannot use ordinary least squares to estimate the parameters. In the appendix are the results from an Augmented Dickey Fuller tests, which indicate that interpersonal trust time series is clearly stationary indicating that a standard Granger test is appropriate.

<sup>8</sup>The lag length tests indicated that two lags were appropriate. However, shortening the lag length is done to gain degrees of freedom at the expense of mis-specifying model (Enders, 1991). While a two lag model was deemed superior based on AIC, SBIC, HQIC, a Likelihood Ratio test, and several other criteria, I also estimated models with up to six lags. The results were unchanged. I also estimated a set of models with an exogenous time trend, which also left the results unchanged.

Table 3: Direction of Granger Causality Between Civic Engagement and Trust

Independent Variable	Civic Engagement	Interpersonal Trust
Block F-test $p$ -value Civic Engagement	–	.00
Block F-test $p$ -value Interpersonal Trust	.14	–
N	109	100

Note: Data are quarterly, 1972:2 to 2000:4.  
Each variable was lagged two quarters. OLS estimates.

evidence demonstrates that interpersonal trust is Granger caused by civic engagement. While movement in civic engagement over time will cause shifts in interpersonal trust, shocks to interpersonal trust will leave civic engagement unchanged.

The results leave us with two implications. First, the results, here, must change how we understand the effects of social capital. The effects of social capital may work either indirectly through civic engagement or more directly through either aspect. Specifically, the evidence, here, cautions against assuming that social capital exerts a simple unidirectional effect on societal and political outcomes, for often interpersonal trust may have important effects while civic engagement has only indirect effects through trust (Knack, 2002). Second, I can straightforwardly model social capital with a simple recursive system.

## 4 Modeling Social Capital

With matters of causality settled, I next explore some of the proximate causes of social capital. The analyses, here, of civic engagement and interpersonal trust are intended to test prior social capital theory, theory that has thus far had little empirical verification. I start with a model of civic engagement.

Here in an analysis of civic engagement I test whether civic engagement is a function of over time changes in resources (Putnam, 1995*a,b*, 2000). I break resources into the categories of time and money. To capture the time citizens have available for civic participation, I

create a *Time resources index* variable with four indicators. The first indicator of time available is hours worked per week. As people work longer hours, less time should be left for civic activities. I use the Bureau of Labor Statistics' index of aggregate hours worked per week to operationalize increases in job-related time pressures. I also include the Bureau of Labor Statistics' female labor participation rate. As more women enter the workforce, active employment may have replaced traditional civic activities. To capture increased commute times and suburbanization, I use the number of miles travelled each year by private non-commercial vehicles on all roads. As commute times have increased and longer distances are travelled due to urban sprawl, the time left for community involvement is further sapped. Finally, I include the average household hours per day of television viewed, to capture the amount of time spent in the home.<sup>9</sup> The four measures form an index of time available that should have a negative effect on civic engagement over time.

Economic resources are also an important component of being able to participate in civic life (Verba, Schlozman and Brady, 1995). As wealth becomes more or less concentrated over time, the ability of some segment of the population to participate should increase or decrease (Knack, 2002). To operationalize the effect of income inequality, I use the *GINI* coefficient measure of income inequality. I also include past participation in the models given that one history of participation should matter for future involvement regardless of resource levels. That is to say even if one has the time and money to participate, if participation is a negative experience, it is unlikely to be repeated.

The model for civic engagement uses annual data since both the transportation and television viewing measures were only available annually. I should emphasize that the model is meant to serve as an empirical confirmation of extant social capital theory. While much

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<sup>9</sup>More specifically, the hours worked variable is the B.L.S seasonally adjusted index of aggregate weekly hours for all private industry, 1982=100. I use the logarithm of this variable in the index. The miles travelled variable is the annual vehicle distance travelled in miles for passenger cars and other 2 axle 4 tire vehicles for all rural and urban roads as calculated by the Department of Transportation. The television watched data is collected by the A.C. Nielsen Co. and is the average hours of household television usage per day. And female labor rate participation is the share of the female population 16 or older working or seeking work. A factor analysis of the four items returned only a single eigenvalue above 1 and the variable in the analysis is a factor score from the factor analysis. The factor score correlated with an average of the four items at .96.

has been written about how time- and economic-related pressures may have affected civic engagement, empirical confirmation of this phenomena has been rare.

## 4.1 Civic Engagement, Time and Money

I model civic engagement using the general-to-specific modeling approach to time series analysis. The intuition behind general-to-specific modeling of time series data is to write the model in a general form and then test restrictions to that model.<sup>10</sup> Given the lack of priors on what the dynamics of a model of civic engagement might be, I am able to start with a general model and then develop a more specific dynamic specification. The general form I start with is the autodistributed lag (ADL) (1,1) model, here, shown with a single covariate for simplicity:

$$Y_t = \alpha_1 Y_{t-1} + \beta_0 X_t + \beta_1 X_{t-1} + \varepsilon_t \quad (1)$$

Using this general model, I tested several restrictions to develop a specific dynamic model of civic engagement.<sup>11</sup> Table 4 contains the results from the final model, which is the result of a set of linear restrictions that were applied to equation 1. In the model, we see that both increased time pressures and income inequality have statistically significant effects on civic engagement.<sup>12</sup> Therefore, the statistical analysis confirms that the resources of time and money are critical to aggregate levels of civic participation. Moreover, a decline in these resources will have a corrosive effect on the civic life of a nation. As the statistical model demonstrates, as individuals work longer hours, drive longer distances, watch more television have lessened economic resources, and there are greater numbers of women in the labor force,

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<sup>10</sup>For readers unfamiliar with general-to-specific modeling of time series data, I refer them to the seminal Davidson et al. (1978) paper for one of the first occurrences of this type of modeling and to Charemza and Deadman (1997).

<sup>11</sup>In particular, I tested the restriction that  $\alpha_1 - 1 = -(\beta_0 + \beta_1)$  which implies an error correction model to test whether the variables in the model were cointegrated. (I also performed the more traditional Granger Two-Step test for cointegration.) In both cases, there were no signs of cointegration or error correction.

<sup>12</sup>To confirm the results from the Granger test, I included interpersonal trust in both the general model as well as all of the more specific models tested, and it was not statistically significant in any specification. I also tested whether changes in the level of education had an effect and found that it did not.

they have fewer resources to devote to active involvement in civic life. No surprise, but it is some of the first decisive empirical evidence that such pressures have affected levels of civic engagement. Now, let us examine how these time and economic pressures are indirectly related to the over time movement in interpersonal trust.

Table 4: Determinants of Civic Engagement

	Civic Engagement
Civic Engagement $_{(t-1)}$	0.71* (0.12)
$\Delta$ Gini $_t$	-0.43* (0.23)
Time Resources Index $_{(t-1)}$	-0.58* (0.29)
Constant	9.96* (4.30)
Adj. R <sup>2</sup>	.95
N	26
Box Q	7.67
$\chi^2$ $p$ -value	0.57

Note: OLS Estimates. Data are yearly from 1975 to 1999.  
Standard Errors in Parentheses. One tailed test.  
\*  $p < 0.05$

## 4.2 Interpersonal Trust and Civic Engagement

Next, I model interpersonal trust as a function of a set of possible explanatory variables. Here, besides, civic engagement I also control for collective experiences, which are thought to affect interpersonal trust (Brehm and Rahn, 1997). Poor economic times are thought to diminish trust as scarcity leads people to view others as competitors. Also times of national tragedy or war may cause a sense of compassion and trust (Brehm and Rahn, 1997).

Again I relied on the ADL (1,1) to develop a dynamic specification. In the end, I modeled quarterly changes in interpersonal trust as a function of lagged interpersonal trust (at quarter

$t - 1$ ) and changes in collective experiences and civic engagement and lagged collective experiences and civic engagement. I also include dummy variables for events that may also contribute to collective experiences.

This specification represents a single-equation error correction model (ECM), which is a special case of an ADL (1,1) (Bannerjee et al., 1993).<sup>13</sup> An ECM estimates both a long and short-term parameter for each independent variable. The difference of each independent variable in the equation represents the immediate impact of that variable, while the lagged value of the independent variable represents the long-term effect of that variable. So in each model, each independent variable can have either a long or short term effect. (Please see the appendix for a discussion on the use of single equation error correction models in this context.)

To capture economic evaluations, I use the University of Michigan's *Index of Consumer Sentiment* (ICS), a set of survey items designed to tap public perceptions of economic prosperity. Another variable captures a variety of national events that may affect generalized levels of trust.<sup>14</sup> The *Event* measure is a dummy variable includes events such as the fall of the Berlin Wall to the Oklahoma City bombing, the variable has a 1 for each positive event and a -1 for each negative event.<sup>15</sup> The events that are included are admittedly ad hoc. However, any list of events would be and those included are ones that might reasonably have an effect.

Table 5 contains the results from a model with interpersonal trust as a function of civic engagement and another model, which includes the measures of collective experiences. Civic engagement is related to interpersonal trust, and, only has a long term effect. Therefore, any increase or decrease in civic engagement will not be felt immediately, but, instead, will occur across future quarters. Of course, the statistical results imply that it takes time for

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<sup>13</sup>In the context of the ADL(1,1) model presented earlier, I am testing the following restriction:  $\alpha_1 - 1 = -(\beta_0 + \beta_1)$ .

<sup>14</sup>In another specification, I include a measure for crime rates. This measure was always statistically insignificant. Moreover only annual crime rate data were available thus substantially decreasing the N. For this reason the yearly model with crime rates is omitted.

<sup>15</sup>See the appendix for a complete list of events included in the variable.

the lessons learned in civic engagement to translate into higher amounts of generalized trust. For example, should there be a five-point increase in civic engagement, interpersonal trust will be out of its equilibrium relationship with civic engagement and will increase by nearly two points. This disequilibrium will be corrected at 30% per quarter such that interpersonal trust will increase by 0.57 at  $t+1$ , 0.40 at  $t+2$  and so on until the two series have equilibrated.

The second model in the table includes the measures of collective experiences. The effects of collective experiences in the form of economic evaluations only occur in the short-term. As the economy is collectively experienced, it has an immediate effect on interpersonal trust, with no residual long-run equilibrium effect. Therefore, the effects of collective economic experiences are completely transitory and, as a result, collective experiences contribute nothing to the long term trends in trust. Collective experiences, then, are important to short-term levels of interpersonal trust, but given the transitory nature of the effects cannot account for the long term trends in trust. The decline in civic engagement, however, has been a critical factor in the decline of trust over the last thirty years. The pressures of time and money exerted on civic participation then slowly have had deleterious effects on levels of interpersonal trust.

The civic engagement and interpersonal models of social capital, viewed together, provide an understanding of social capital as a macro process over the last thirty years in the United States. As we have seen, inequality and time available affect civic engagement. Therefore, as the resources needed to engage in civic life have been depleted, the health of the civic sphere has suffered. And while interpersonal trust may shift up and down over time due to collective experiences, the systematic decline in civic engagement has depressed levels of interpersonal trust.

Table 5: Interpersonal Trust by Civic Engagement and Collective Experiences

		$\Delta$ Interpersonal Trust <sub>t</sub>	$\Delta$ Interpersonal Trust <sub>t</sub>
Interpersonal Trust (Lagged)		-0.30 ** (0.06)	-0.30 ** (0.06)
Civic Engagement	Short Term	-0.32 (0.39)	-0.38 (0.39)
	Long Term	0.38 ** (0.10)	0.43 ** (0.11)
Index of Consumer Sentiment	Short Term	-	0.08* (0.04)
	Long Term	-	0.02 (0.02)
Events		-	0.48 (0.48)
Constant		2.13 (2.42)	-1.30 (3.40)
R <sup>2</sup>		.22	.26
N		110	110
Box Q (df=40)		.99	.98

Note: OLS Estimates. Standard Errors in Parentheses. Data are quarterly from the first quarter of 1972 to the second quarter of 1999. One tailed tests. For the exact coding of the Events measure see the Appendix.

\*  $p < .05$

\*\*  $p < .01$

## 5 Conclusion

Social capital is no longer a longitudinal concept without a longitudinal measure. Scholars now have valid and reliable measures of social capital from which it is possible to make inferences about the effects of social capital. A longitudinal measure also allows me to decisively demonstrate that civic engagement is exogenous to trust. The data, here, also allow us to examine how a society moves from one level of social capital to another over time. As the resources required for civic participation decline, citizens are unable to partake in the civic life of their communities. Without the social interaction and reciprocity that occur in civic life, a society becomes jaded and mistrustful as levels of interpersonal trust decline. Creating a longitudinal measure, then, is not only useful for further research but provides a substantive understanding of how social capital operates.

Understanding that the over time movement of social capital provides some insight into how we might change its trajectory. While we must be careful to avoid the ecological fallacy, understanding that social capital is a process must underscore the importance of civic engagement in a society. As the results here imply, a society that lacks a robust civic life can expect adverse affects on interpersonal trust, economic development, educational attainment, confidence in political institutions, compliance with legal authorities, and government performance.

Given the obvious importance of civic engagement, the findings, here, must spur a better understanding of how to increase civic participation. The health of the nation's civic life seems particularly endangered as there is little reason to expect an abatement in the decline of the resources required for participation. The trends in commute times, the amount of personal entertainment available beyond television, and the demands for greater productivity in the workplace all show no signs of reversing. Moreover, income inequality, while reversing briefly in the 1990's, is now moving in a similar direction. So while the importance of civic participation seems all the more salient, civic activity appears increasingly rare.

## Appendix

### A Measures of Social Capital

Below are the exact question wordings of the items included in both the civic engagement and trust components of the social capital index. Readers should note that Roper Starch is *not* the Roper Center. Roper Starch is a private polling organization and much of their data is archived at the Roper Center just many commercial poll are such as Gallup.

#### Measures of community organizational life

1. Served on committee of local organization in last year (Percent)
  - (a) Now here is a list of things some people do about government or politics. Have you happened to have done any of those things in the past year? (If Yes:) Which ones? Served on a committee for some local organization. Roper Starch Polling, N=239
2. Served as officer of some club or organization in last year (Percent)
  - (a) I'm going to read to you a list of things some people do about government or politics. Many people haven't done any of these things. As I read each one please tell me if this is something you have done in the past 12 months. In the past twelve months have you served as an officer of some club or organization? Princeton Survey Research N=3
  - (b) Now here is a list of things some people do about government or politics. Have you happened to have done any of those things in the past year? (If Yes:) Which ones? Served as an officer of some club or organization. Roper Starch Polling, N=239
3. Club meetings attended last year. DDB Needham Life Style archive, 1975-1998 (Mean of those who attend any club meetings versus those who attended no club meetings.) N=24
4. Number of group memberships. The following items are from commercial polling firms.
  - (a) Do you belong to any groups or organizations here in the community? (Percent) N=1
  - (b) Are you a member of Volunteer Group? (Percent) N=1
  - (c) Do you happen to belong to any groups or organizations in which you regularly participate—by groups or organizations I mean service clubs, fraternal organizations? (Percent) N=1

#### Measures of engagement in public affairs

1. Attended public meeting on town or school affairs in last year (Percent)

(a) Now here is a list of things some people do about government or politics. Have you happened to have done any of those things in the past year? (If Yes:) Which ones? Attended a public meeting on town or school affairs. Roper Starch Polling, N=239

2. Wrote to Congress person. (Percent)

(a) Now here is a list of things some people do about government or politics. Have you happened to have done any of those things in the past year? (If Yes:) Which ones? Written your Congressman or Senator. Roper Starch Polling, N=209

(b) Have you happened to have done any of those things in the past year? (If Yes:) Which ones? Written or called any politician. Roper Starch Polling, N=30

### Measures of Community Volunteerism

1. Number of nonprofit (501[c]3) organization per 1,000 population. IRS Data, gathered but not used in analysis.

2. Mean number of times worked on community project in last year. DDB Needham Life Style Archive, 1975-1998. (Mean of those who worked on a community project versus those who did not) N=24

3. Did volunteer work in last year

The item for volunteering produced the greatest variety of question wordings. Most only varied due to different time frames for when the respondent may have volunteered. I placed the questions into six groups, and present an example of the question wording for each group. Minor variation may have occurred within the wording of each group but I deemed the difference insignificant.

(a) Group 1: Did volunteer work: frequency last year. DDB Needham Life Style Archive, 1975-98. (Mean of those who volunteered versus those who did not)

(b) General volunteer question, time frame last year Example: In the last year or so, have you done any volunteer work for any church, charity or community group? (Percent) N=39

(c) Group 2: Level of activity. Example: Are you very active, somewhat active, or not active in any community group such as a religious group, volunteer group, or recreation group? (Percent) N=2

(d) Group 3: Volunteered in the last 7 days. Example: In the last seven days did you volunteer some of your free time to help a nonprofit organization, not including a church? (Percent) N=2

(e) Group 4: Volunteered in the last month. Example: In the past 30 days, roughly how many hours, if any, did you spend on volunteer activities? Just your best estimate. (None versus some Percent) N=5

(f) Group 5: Have you ever volunteered. Example: Are you now or have you in the past done any volunteer work in your community? (Percent) N=4

I also included items that asked whether people had volunteered for specific groups.

- (a) Do you volunteer at church? (Percent) N=11
- (b) In the past year, did you do any volunteer work for... Religious and church related activities. (Percent) N=2
- (c) Have you ever done volunteer work for a political party or a political candidate? (Percent) N=2
- (d) In recent years, have you worked as a volunteer for an environmental or conservation group? (Percent) N=3
- (e) Anytime in the last year have you volunteered for an environmental clean up? (Percent) N=4

### **Measures of informal sociability**

- 1. Agree that "I spend a lot of time visiting friends." DDB Needham Life Style archive, 1975-1998 (Percent) N=21
- 2. Number of times entertained at home in last year. DDB Needham Life Style archive, 1975-1998 (Mean of those who entertained at home versus those who did not.) N=23

### **Measures of social trust**

The social trust items come from numerous sources. Besides data from the GSS and NES, I found that many commercial polling organizations also ask the same survey questions, without which this series would not be possible.

- 1. Agree that "Most people can be trusted"
  - (a) (Trust 1) Generally speaking, would you say that most people can be trusted or that you can't be too careful in dealing with people? (Percent) N=32
  - (b) (Trust 2) Most people can be trusted. Strongly Agree, Mildly Agree, Mildly Disagree, Strongly Disagree (Percent of Strongly and Mildly Agree Combined) N=2
  - (c) (Trust 3) Do you think most people would try to take advantage of you, if they got the chance, or would they try to be fair? (Percent) N=24
  - (d) (Trust 4) Now I want to read you some things some people have told us they have felt from time to time. Do you tend to feel or not feel that...Most people with power try to take advantage of people like yourself? (Percent) N=32

## **B Measures In The Analysis**

The event variable is a dummy variable with 1's for positive events and -1's for negative events that may affect the nation's sense of trust. The variable is coded for the following positive events: the Camp David Accords, 1978:q3; Iran Hostages Released, 1981:q1; Fall of the Berlin Wall, 1989:q4; Release of Nelson Mandela, 1990:q1, Soviet Union Falls, 1991:q4;

Israeli-Palestinian Peace Accord, 1993q:3. The following events were coded as negative events: Iran Hostages Taken, 1979:q4; Challenger Explosion, 1986:q1; Black Monday, 1987:q4; Pan Am Flight 103, 1988:q4; L.A. Riots, 1992:q2, Civil War in Rwanda, 1994:q2; Oklahoma City Bombing, 1995:q2.

## C Time Series Modeling Aspects of Social Capital

Below are presented the results from unit root tests for all the measures used in the analysis. This section also includes a brief explanation of how error correction models work with stationary data.

<b>Augmented Dickey-Fuller Tests for Granger Analysis</b>		
<b>Civic Engagement</b>		
	Test Statistic	5% Critical Value
No Constant	-1.93	-1.95
Trend	-2.308	3.592
No Trend	-0.499	2.994
<b>Interpersonal Trust</b>		
	Test Statistic	5% Critical Value
No Constant	-1.161	-1.95
Trend	-3.545	-3.45
No Trend	-2.99	-2.89

<b>Augmented Dickey-Fuller Tests for Civic Engagement Analysis</b>		
<b>Civic Engagement</b>		
	Test Statistic	5% Critical Value
No Constant	-1.93	-1.95
Trend	-2.31	-3.60
No Trend	-0.50	-3.00
<b>Time Resources Index</b>		
	Test Statistic	5% Critical Value
No Constant	-0.49	-1.95
Trend	-2.50	-3.60
No Trend	-0.36	-3.00
<b>GINI Coefficient</b>		
	Test Statistic	5% Critical Value
No Constant	2.42	-1.95
Trend	-3.14	-3.60
No Trend	0.40	-3.00

### **Error Correction and Interpersonal Trust**

While single equation error correction models (ECM) are extensively used for modeling cointegrating relationships, the single-equation error correction specification is more general and can be used to model a variety of time series relationships. Banerjee et al. (1993) prove that ECMs are linear reparameterizations of autoregressive-distributed lag (ADL) models designed for stationary data. They demonstrate that the primary difference between the ADL and ECM formulations is that in an ECM the short-run parameters are estimated directly in the regression. As such the error correction formulation is entirely appropriate for both stationary data and non-stationary data. In fact the first use of ECMs (Sargan, 1964), predate the literature on cointegration. Deboef and Granato (1999) argue that ECMs are the appropriate choice in political data with long memories. Moreover the results from a distributed lag (using the Koyck transformation) and an ARMA(1,0) model both return significant effects for ICS and civic engagement, but do not allow for discrimination between long and short term effects as the ECM does.

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