

Macro Measures and Mechanics of Social Capital

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Interest in social capital has grown as it has become apparent that it is an important predictor of collective well-being. Recently, attention has shifted to how levels of social capital have changed over time. But better measures are required to test even basic hypotheses such as 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 use these measures to test basic assumptions about social capital. The result is not only 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; 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 (Fukuyama 1995; Putnam 1995a, 1995b, 2000; Brehm and Rahn 1997; Coleman 1988).¹ Communities with high levels of social capital have both extensive civic networks with high levels of community participation and high levels of trusting attitudes.² Social capital appears to be an important

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¹Coleman'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.

²The 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).

predictor of indicators of collective well-being such as economic development, educational attainment, confidence in political institutions, lower crime rates and government performance (Fukuyama 1995; Putnam 1995a, 2000; Brehm and Rahn 1997; Coleman 1988; Knack 2002).

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 United States (Putnam 1995a, 1995b, 2000; Paxton 1999; Costa and Kahn 2001). 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 rely not on an over-time index of social 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.

But measurement requires new precision in how we define social capital as a macro concept. This precision obliges us to consider that we cannot treat social capital as a unified concept with general causes and effects, but instead as the longitudinal causal mechanics between civic activity and interpersonal trust. To do otherwise obscures how we understand the effects of social capital. The task at hand, then, is the construction of unified macro measures of social capital for use in testing hypotheses about the effects of changes in social capital over time.

2 Building Measures 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.³ After an examination of the raw materials that comprise social capital, I use a well-known method to construct 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 do not form anything like a regular time series. Survey questions are asked when pollsters feel like asking them

³At 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.

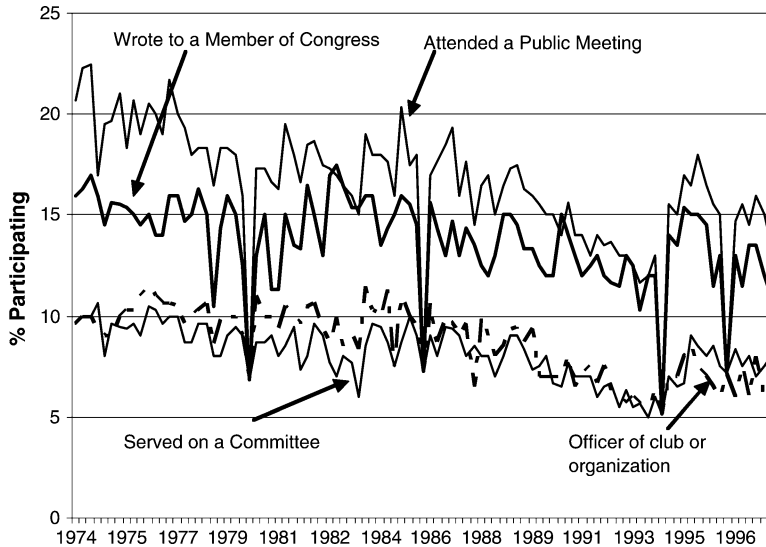


Fig. 1 Roper indicators of social capital: civic engagement.

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 Roper Center archives survey data from a wide variety of commercial polling organizations such as Gallup, the *New York Times*, and *ABC/Wall Street Journal*, 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 wording for the items in the interpersonal measure come from NES and GSS, the items used to build the measure 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

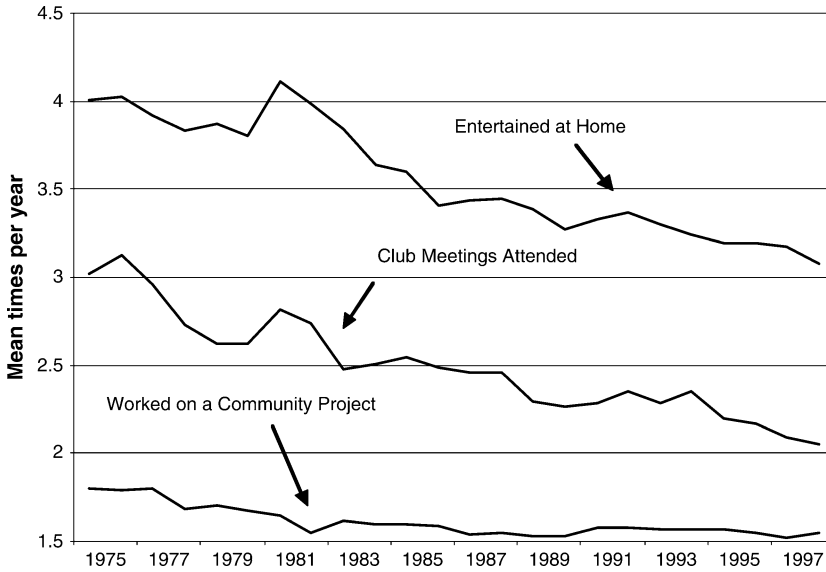


Fig. 2 DBB Needham indicators of social capital: civic participation.

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.⁴

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.

Such visual association is the present state of macro level social capital measurement theory. While the naked eye might assume that 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

⁴Roper 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.

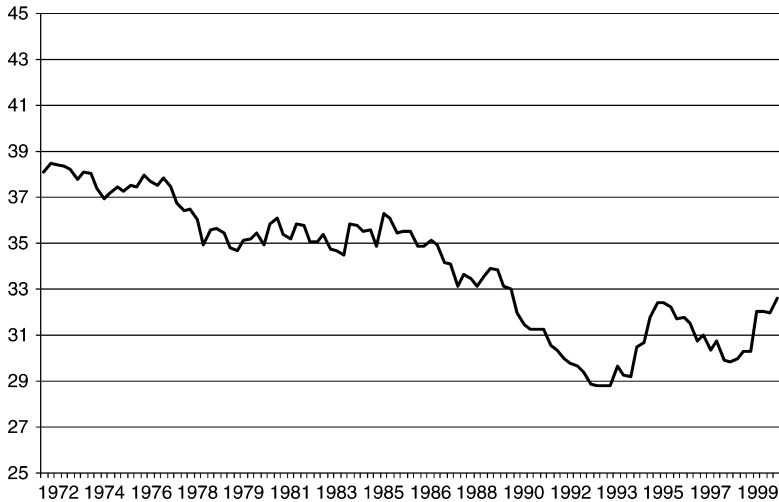


Fig. 3 Civic engagement, 1972:3–2002:2.

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 measures the underlying latent construct. The principal components analog produces a loading—interpretable as a correlation—between the indicator (here a set of survey marginals over time) and the latent construct. If a series of survey marginals measures the underlying construct, they will produce a high loading. However, unlike most principal components analyses, the approach is inherently confirmatory. Stimson's method has been widely used to construct time series measures of public opinion (Durr et al. 1993, 1997; Freeman et al. 1998; Chanley et al. 2000; Kellstedt 2000).

In keeping with the confirmatory approach of the method I first estimate a separate civic engagement series composed of over 20 indicators and 1000 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.

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 produces 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 load above 0.6 and many of the loadings are above 0.8. The index explains 62 percent of the variance

Table 1 Loadings between civic engagement indicators and overall index

<i>Survey Item</i>	<i>Civic Engagement</i>
Served on a committee N = 239	.84
Officer of an organization 1 N = 3	.91
Officer of an organization 2 N = 239	.87
Club meetings attended N = 24	.84
Membership in a group N = 3	.85
Attended a public meeting N = 239	.89
Wrote to congressperson N = 209	.67
Wrote or called politician N = 30	.57
Worked on a community project N = 24	.63
Did volunteer work 1 N = 24	.46
Did volunteer work 2 N = 2	1.00
Did volunteer work 3 N = 2	1.00
Did volunteer work 4 N = 5	.88
Did volunteer work 5 N = 4	.54
Volunteer at church 1 N = 11	.81
Volunteer at church 2 N = 2	.41
Volunteer in politics N = 2	1.00
Volunteer for the environment 1 N = 3	.66
Volunteer for the environment 2 N = 4	.79
Time spent visiting friends N = 21	.60
Times entertained at home N = 23	.81
First eigenvalue estimate	12.4
% Variance Explained	62

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

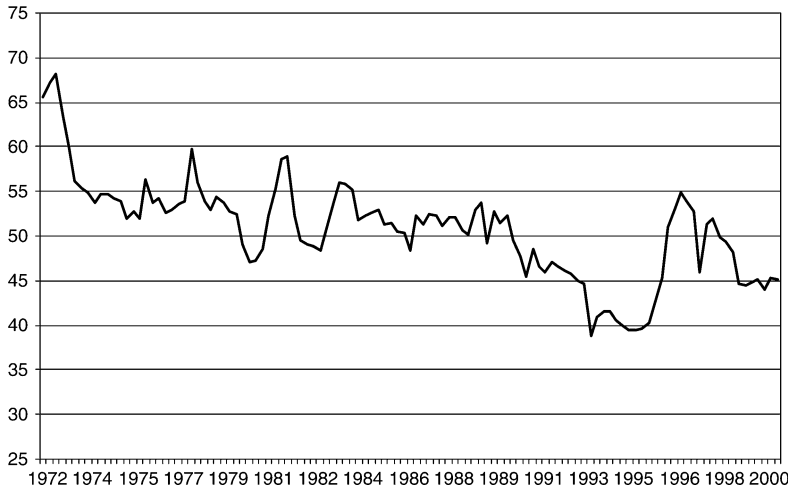


Fig. 4 Interpersonal trust, 1972:2–2000:4.

in the indicators collectively, which indicates exceptional model fit. The empirical results allow me to be confident that this set of indicators forms 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 30 years. In fact, interpersonal trust has dropped nearly 20 points during the time span here.⁵ The largest decline in the series is in 1972, while a large upswing occurs in the mid-1990s.

Civic engagement and interpersonal trust do appear to have some common variation as both declined noticeably in the early 1990s. 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 model. I also estimated one model in which the trust items were included with the civic

⁵Stimson'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 and interpersonal trust are not directly comparable.

Table 2 Loadings between interpersonal trust indicators and overall index

<i>Survey Item</i>	<i>Interpersonal Trust</i>
Trust item 1 N = 32	.84
Trust item 2 N = 2	1.00
Trust item 3 N = 24	.62
Trust item 4 N = 32	.92
First eigenvalue estimate	2.7
% variance explained	68

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

engagement items. Here the trust items loaded poorly on the underlying construct, and the overall fit of the measurement model suffered.⁶ 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 allow 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 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 et al. 1989).⁷

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

⁶Stimson'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.

⁷Any 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 nonstandard and the analyst cannot use ordinary least squares to estimate the parameters. In the appendix are the results from Augmented Dickey Fuller tests, which indicate that the interpersonal trust time series is clearly stationary, indicating that a standard Granger test is appropriate.

Table 3 Direction of Granger causality between civic engagement and trust

<i>Independent Variable</i>	<i>Civic Engagement</i>	<i>Interpersonal Trust</i>
Block F-test <i>p</i> -value civic engagement	–	.00
Block F-test <i>p</i> -value interpersonal trust	.14	–
N	109	109

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

engagement Granger causes interpersonal trust. Under the second Granger test, if the null succeeds, we infer that interpersonal trust Granger causes civic engagement.⁸

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 over-time 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, 2001, 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 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. These effects 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). Moreover, the finding has some micro-level support. Brehm and Rahn (1997) find that the effect of civic engagement on interpersonal trust is much stronger than the reverse effect. 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 of civic engagement and interpersonal trust are intended to test prior social capital theory, theory that has thus far had little empirical verification. The following analyses are also intended as a test of construct validity. If I find that the measures of social capital are related to a variety of other measures as specified from theory, this will provide additional evidence of the measures' validity. I start with a model of civic engagement.

In an analysis of civic engagement I test whether civic engagement is a function of over-time changes in resources (Putnam 1995a, 1995b, 2000). I break resources into the

⁸The 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 misspecifying 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.

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 traveled each year by private noncommercial vehicles on all roads. As commute times have increased and longer distances are traveled 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.⁹ 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 et al. 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's 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 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 that represent differing dynamics to that model.¹⁰ 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, shown here with a single covariate for simplicity:

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

⁹More 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 traveled variable is the annual vehicle distance traveled in miles for passenger cars and other two-axle four-tire vehicles for all rural and urban roads as calculated by the Department of Transportation. The television watched data are collected by the A.C. Nielsen Co. and show 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.

¹⁰For 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).

Table 4 Determinants of civic engagement

	<i>Civic Engagement</i>
Civic engagement _(t-1)	0.71* (0.12)
Δ Gini _t	-0.43* (0.23)
Time resources index _(t-1)	-0.58* (0.29)
Constant	9.96* (4.30)
Adj. R ²	.95
N	26
Box Q	7.67
χ^2 p-value	0.57

Note. OLS estimates. Data are yearly from 1975 to 1999.

Standard errors in parentheses. One-tailed test.

* $p < 0.05$.

Using this general model, I tested several dynamic restrictions to develop a specific dynamic model of civic engagement.¹¹ Without any theory to guide the dynamic specification, I tested several plausible dynamic specifications from the time series literature. Table 4 contains the results from the final model, which is the result of a set of linear restrictions that were applied to Eq. (1). In the model, we see that both increased time pressures and income inequality have statistically significant effects on civic engagement.¹² The general dynamic specification is one in which changes in income inequality and lags of the time resources index have significant effects. 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, and watch more television, and have lessened economic resources, and as there are greater numbers of women in the labor force, people 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.

4.2 Interpersonal Trust and Civic Engagement

Next, I model interpersonal trust as a function of a set of possible explanatory variables. Besides civic engagement, I also control for collective experiences, which are thought to affect interpersonal trust (Brehm and Rahn 1997). Brehm and Rahn

¹¹In 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 Engle-Granger two-step test for cointegration.) In both cases, there were no signs of cointegration or error correction.

¹²To 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 they did not.

(1997) identify several indicators of collective experiences, including economic prosperity and crime. Poor economic times are thought to diminish trust as scarcity leads people to view others as competitors. Crime is assumed to contribute to jaded views of other citizens. Times of national tragedy or war may also 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 interpersonal trust as a function of lagged interpersonal trust (at quarter $t - 1$), collective experiences in the form of economic prosperity, crime, civic engagement, and lagged collective experiences and civic engagement. I also include dummy variables for events that may contribute to collective experiences.

This specification represents a lagged dependent variable (LDV) or partial adjustment model, which is also a special case of an ADL (1,1).¹³ The regression coefficient, β_0 , in the model represents the effect of current X values on current Y values (controlling for lagged interpersonal trust). The effect of an X variable cumulates at a rate determined by the autoregressive effect of lagged interpersonal trust or α_1 in the model. Thus, the effect of an X variable will not only be contemporaneous but also feed forward into the future at the following rate: $\beta_0/(1 - \alpha_1)$. Since the lagged effects decay exponentially, current and recent values outweigh more distant effects.

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. To measure public perceptions of crime, I use the proportion of respondents who identify crime as the "most important problem." The *Event* measure is a dummy variable that includes events such as the fall of the Berlin Wall and the Oklahoma City bombing. The variable has a 1 for each positive event and a -1 for each negative event.¹⁴ 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 that includes the measures of collective experiences. Civic engagement is related to interpersonal trust and appears to have a substantive effect. A one-unit increase in civic engagement significantly increases interpersonal trust by .32 points. However, under the LDV model, the total effect is larger. A single unit shock decays at the rate $.32/(1-.75)$, making the cumulative effect 1.21 after ten quarters with 80% of the effect felt in the first five quarters.

The second model in the table includes the measures of collective experiences. Only economic judgments seem to matter here. While the measure of crime is correctly signed, it fails to achieve statistical significance. The effect of economic prosperity is also much smaller than that of civic engagement. An increase of the Index of Consumer Sentiment will then increase interpersonal trust by around 0.10 points. One of the largest changes in the Index of Consumer Sentiment from one quarter to the next is ten points, which would

¹³In the context of the ADL(1,1) model presented earlier, I am testing the following restriction: $\beta_1 = 0$.

¹⁴The event variable is a dummy variable using 1 for positive events and -1 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, 1993:q3. 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.

Table 5 Interpersonal trust by civic engagement and collective experiences

	Δ Interpersonal Trust _t	Δ Interpersonal Trust _t
Interpersonal trust (lagged)	0.75** (0.05)	0.72** (0.06)
Civic engagement	0.32** (0.10)	0.38** (0.11)
Index of consumer sentiment	–	0.03* (0.01)
Events		0.33 (0.50)
Crime	–	–0.05 (0.05)
Constant	1.37 (2.44)	–0.56 (3.66)
R ²	.83	.84
N	111	110
Box Q (df = 40)	26.25	25.06
χ^2 p-value	0.57	0.97

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.

* $p < .05$.

** $p < .01$.

change interpersonal trust exactly one point. The decline in civic engagement, it would appear, has been a critical factor in the decline of trust over the last 30 years. The pressures of time and money exerted on civic participation have had deleterious effects on levels of interpersonal trust.

The civic engagement and interpersonal trust models of social capital, viewed together, provide an understanding of social capital as a macro process over the last 30 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. 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. The analysis here also provides a robust test of the measures' construct validity.

5 Social Capitals

I began with the question: How do we measure how a society moves from one level of social capital to another over time? The result not only provides researchers with empirical measures, but also changes our understanding of social capital as a concept. It is now clear that 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.

Consider the differences between this new model of social capital and the traditional model of social capital. Under conventional wisdom, a series of downward shocks have driven social capital down over time. Alternatively, a more complex process has occurred,

as civic engagement is slowly eroded by the pressures of modern life that sap the resources required to devote to participation in the P.T.A., neighborhood watch, and bowling leagues. In turn, while our sense of trust bobs up and down given our collective experiences underneath these fluctuations, without robust participation in the civic life of a nation, that sense of trust slides downward.

The key difference between the traditional model and the new model is the nature of how shocks affect social capital and how we should expect changes in social capital to affect political and social life. In the traditional model, any shocks to either component are assumed to affect the other component. Under the traditional model, we might expect a renewal of civic life after the events of 9/11, which in turn should further bolster the societal stock of trust. But under the new model, while we should expect trust to respond to a galvanizing event like 9/11, we cannot expect any increased civic engagement.

Understanding that the over-time movement of social capital is a process forces a re-examination of how social capital has declined and 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, which erodes levels of interpersonal trust, can expect adverse effects on 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 1990s, 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

1 *Measures of Social Capital*

Below are the exact wordings of the questions 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 are archived at the Roper Center just as many commercial polls are at Gallup. Below, for each survey item used in the analysis, I list the label from either Table 1 or Table 2, the question wording, the source of the survey item, and the number of times that survey item was asked. The items in the appendix are in the same order as they appear in the table.

Measures of community organizational life

1. Served on a committee:

- (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. (Percent) Roper Starch Polling, N = 239

2. Served as officer of some club or organization in last year (percent)
 - (a) Officer of an organization 1: 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 12 months have you served as an officer of some club or organization? Princeton Survey Research N = 3
 - (b) Officer of an organization 2: 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: 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) Membership in a group: Do you belong to any groups or organizations here in the community? (Percent) N = 1
 - (b) Membership in a group: Are you a member of a volunteer group? (Percent) N = 1
 - (c) Membership in a group: 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) Attended a Public Meeting: 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 congressperson (percent)
 - (a) Wrote to a Congressperson: 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) Wrote to a politician: 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. Worked on a community project: 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 varied due to different time frames for when the respondent may have volunteered. I placed the questions into five 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) Did volunteer work 1: Did volunteer work: frequency last year. DDB Needham Life Style Archive, 1975–1998. (Mean of those who volunteered versus those who did not)
- (b) Did volunteer work 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
- (c) Did volunteer work 3: Volunteered in the last seven 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
- (d) Did volunteer work 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
- (e) Did volunteer work 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) Volunteer at church 1: Do you volunteer at church? (Percent) N = 11
- (b) Volunteer at church 2: In the past year, did you do any volunteer work for religious and church related activities. (Percent) N = 2
- (c) Volunteer in politics: Have you ever done volunteer work for a political party or a political candidate? (Percent) N = 2
- (d) Volunteer for the environment 1: In recent years, have you worked as a volunteer for an environmental or conservation group? (Percent) N = 3
- (e) Volunteer for the environment 2: At anytime in the last year have you volunteered for an environmental cleanup? (Percent) N = 4

Measures of informal sociability

1. Time spent visiting friends: Agree that “I spend a lot of time visiting friends.” DDB Needham Life Style Archive, 1975–1998 (Percent) N = 21
2. Times entertained at home: 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 item 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 item 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 item 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 item 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

2 Time Series Modeling Aspects of Social Capital

Below are presented the results from unit root tests for all the measures used in the analysis. For both civic engagement and interpersonal trust, Phillips-Perron tests produced results identical to the Augmented Dickey-Fuller Tests.

Augmented Dickey-Fuller Tests for Granger Analysis

	<i>Test Statistic</i>	<i>5% Critical Value</i>
Civic Engagement		
No Constant	-1.93	-1.95
Trend	-2.308	3.592
No Trend	-0.499	2.994
Interpersonal Trust		
No Constant	-1.161	-1.95
Trend	-3.545	-3.45
No Trend	-2.99	-2.89

Augmented Dickey-Fuller Tests for Civic Engagement Analysis

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

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