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# Social Capital, Economic Growth and Regional Development

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IYER S., KITSON M. and TOH B. (2005) Social capital, economic growth and regional development, *Regional Studies* **39**, 1015–1040. This paper examines the relationships between social capital, economic performance and regional development, and it stresses the complexity and variability across space of such relationships. In contrast to the conventional macroeconomic approach of using indicators of social capital in formal growth models, what is required is a more nuanced analysis that evaluates the impact of social capital by region. To support this argument, the paper examines social capital data from the Social Capital Community Benchmark Survey 2000, which provides social capital data for more than 24 000 individuals living in 40 communities, grouped into nine regions, in the USA. These data show remarkable diversity of social capital by region. Multivariate analysis is used to examine the impact of economic and social determinants of social capital and shows that education is important for nearly all indicators of social capital, and that ethnic diversity is associated with lower levels of social capital. Furthermore, analysis indicates the need to distinguish between local and non-local forms of social capital. The paper concludes by suggesting that future analysis of social capital will benefit from a more region-specific approach towards examining its development and impacts.

Social capital  Regional growth  Ethnic diversity  USA

IYER S., KITSON M. et TOH B. (2005) La valeur de l'interaction sociale, la croissance économique et l'aménagement du territoire, *Regional Studies* **39**, 1015–1040. Cet article cherche à examiner les rapports entre la valeur de l'interaction sociale, la performance économique et l'aménagement du territoire, et met l'accent sur la complexité et la variabilité géographiques de tels rapports. Par rapport à l'approche macroéconomique conventionnelle qui nécessite l'emploi des indicateurs de la valeur de l'interaction sociale dans des modèles de croissance formels, ce qu'il faut c'est une analyse plus nuancée qui évalue l'impact de la valeur de l'interaction sociale par région. Afin de corroborer cette affirmation, cet article cherche à examiner des données sur la valeur de l'interaction sociale qui proviennent d'une enquête menée en l'an 2000 sur la valeur de référence de l'interaction sociale dans la communauté, la Social Capital Community Benchmark Survey 2000, qui fournit des données sur la valeur de l'interaction sociale auprès de plus de 24 000 habitants de 40 communautés, regroupées en 9 régions, aux Etats-Unis. Ces données font preuve d'une variation remarquable de la valeur de l'interaction sociale par région. A partir d'une analyse à variables multiples afin d'examiner l'impact des déterminants de la valeur de l'interaction sociale, à la fois économiques et sociaux, on montre que l'éducation s'avère importante pour ce qui est de la plupart des indicateurs de la valeur de l'interaction sociale, et que la diversité ethnique se rapporte à des niveaux inférieurs de la valeur de l'interaction sociale. Qui plus est, l'analyse laisse voir qu'il faut distinguer entre des formes d'interaction sociale endogènes et exogènes. Pour conclure, l'article laisse supposer que des analyses futures du développement et de l'impact de la valeur de l'interaction sociale profiteront d'une approche spécialement concue sur le plan regional.

Valeur de l'interaction sociale  Croissance régionale  Diversité ethnique  Etats-Unis

IYER S., KITSON M. und TOH B. (2005) Sozialkapital, Wirtschaftswachstum und regionale Entwicklung, *Regional Studies* **39**, 1015–1040. Dieser Aufsatz untersucht die Beziehungen zwischen Sozialkapital, wirtschaftlicher Leistung und regionaler Entwicklung, und betont die Vielschichtigkeit und Unbeständligleit solcher Beziehungen über Entfernungen hinweg. Im Gegensatz zum konventionellen makroökonomischen Ansatz, der Indikatoren des Sozialkapitals für formale Wachstumsmodelle benutzt, wird eine fein abgestufte Analyse benötigt, welche die Auswirkung des Sozialkapitals nach Regionen bewertet. Zur Stützung dieser These untersucht der Aufsatz Sozialkapitaldaten von der Untersuchung des Sozialkapitalgemeinschaftsmaßstabs des Jahres 2000, die Sozialkapitaldaten für mehr als 24 000 Einzelpersonen bereitstellt, die in 40 Gemeinschaften leben, welche wiederum in 9 Regionen der USA zusammengefaßt werden. Diese Daten weisen eine regional außerordentliche Vielfalt des Sozialkapitals auf. Es wird eine mehrfach variable Analyse zur Untersuchung der Auswirkung der wirtschaftlichen und

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gesellschaftlichen Determinanten des Sozialkapitals benutzt, die zeigt, daß Schulbildung für fast alle Indkatoren des Sozialkapitals von Bedeutung ist, und daß ethnische Vielfalt mit geringeren Höhen des Sozialkapitals einhergeht. Darüberhinaus lãßt die Analyse die Notwendigkeit erkennen, zwischen örtlichen und nicht-örtlichen Formen des Sozialkapitals zu unterscheiden. Der Aufsatz schließt mit dem Hinweis, daß einer zukünftigen Analyse des Sozialkapital ein region-spezifischeren Ansatz zur Untersuchung seiner Entwicklung und Auswirkungen einer zukünftigen Analyse des Sozialkapitals dienlich sein würde.

Sozialkapital regionales Wachstum ethnische Vielfalt USA

Iyer S., Kitson M. y Toh B. (2005) Capital social, crecimiento económico y desarrollo regional, *Regional Studies* **39**, 1015–1040. Este artículo examina las relaciones que se dan entre el capital social, el rendimiento económico y el desarrollo regional, y presta especial atención a la complejidad de dichas relaciones y cómo estas varían espacialmente. Contrario al enfoque macroeconómico convencional que se basa en la utilización de indicadores de capital social en modelos formales de crecimiento, lo que se necesita es un análisis más exhaustivo que evalúe el impacto que el capital social ejerce en la región. Con el fin de respaldar tal argumento, el artículo analiza los datos del *Social Capital Community Benchmark Survey 2000*, que recoge información sobre el capital social de más de 24.000 personas que habitan en 40 comunidades, agrupadas en nueve regiones, en los Estados Unidos. Los datos revelan que existe una importante diversidad en lo que respecta al capital social por región. Se utiliza un análisis multivariante para examinar el impacto de los determinantes sociales y económicos del capital social y los resultados muestran que la educación es importante para una gran mayoría de los indicadores de capital social, y la diversidad étnica se ve asociada con unos niveles más bajos de capital social. Además, el análisis nos lleva a hacer una distinción entre formas locales y no locales de capital social. Para finalizar, el artículo sugiere que los futuros análisis sobre capital social se beneficiarían de un enfoque más centrado en el aspecto regional de cara a examinar su desarrollo y el impacto del capital social.

Capital social Desarrollo regional Diversidad étnica Estados Unidos

JEL classifications: O51, R11, Z13

## INTRODUCTION

Economists have traditionally focused on natural capital, physical capital and human capital as key determinants of economic growth and a vast body of theoretical and empirical literature in growth economics has examined these relationships (e.g. Solow, 1957; Lucas, 1993; Barro and Sala-i-Martin, 1995). But the focus on these three types of capital often overlooks a critical aspect in the process of economic growth in that they do not explain how economic actors interact. More recently, it has been suggested by some economists and political scientists that the missing link in the growth process is 'social capital'. But what exactly is social capital, and why is its study meaningful for social scientists? More particularly, does the study of social capital have consequences for regional development? This paper addresses some of these key questions by analysing two aspects of the social capital debate. First, it provides a critical evaluation of how social capital may influence economic growth and regional performance. Second, it considers the determinants of social capital, and the case of the USA is examined to illustrate the importance of analysing spatial differences in social capital formation.

The paper is organized as follows. The first section considers the relationships between social capital, economic performance and regional development, and it stresses the complexity and variability across space of such relationships. The second section evaluates the empirics of social capital studies. The third section considers the limitations and difficulties of using social capital. The fourth section considers the determinants of social capital – as with its impacts, such determents have significant spatial variations and this is illustrated by examining the evidence from the USA. The fifth section probes further into the spatial variations of social capital in the USA using multivariate analysis and it shows that education is important for nearly all indicators of social capital, and that ethnic diversity is associated with lower levels of social capital. The sixth section concludes that analysis of social capital may benefit from a more region-specific approach towards examining its causes and impacts.

## SOCIAL CAPITAL, ECONOMIC PERFORMANCE AND REGIONAL DEVELOPMENT

### *Defining social capital*

Social capital, in essence, is the institutions, relationships, attitudes and values governing interactions amongst people and contributing to economic and social development. It has been defined as 'the networks, norms, relationships, values and informal sanctions that shape the quantity and co-operative quality of a society's social interactions' (Performance and Innovation Unit, 2002, p. 5). Defined this way, social capital includes shared values and rules for social conduct including trust and civic responsibility. Its increasing prominence in economics discourse parallels the rise of the 'informal institutions' literature in related fields such as development economics. Social capital may also be important in that it influences the social and political environment that in turn shapes norms

such as those with respect to government, the rule of law, and civil and political liberties (Olson, 1982; North, 1990).

Putnam (1995) (cited in Performance and Innovation Unit, 2002, p. 10) considers social capital as a set of horizontal associations between people – networks and associated norms which have an effect on the productivity of a community: 'Social capital, in short, refers to social connections and the attendant norms and trust'. Such connections can have either positive or negative impacts for society, but the key feature of social capital according to Putnam is that it facilitates coordination and cooperation for mutual benefit of an association's members. Coleman's (1988) definition expands upon that of Putnam to include vertical as well as horizontal associations. Vertical associations are characterized by hierarchical relationships and unequal power distribution among members that may have positive and negative objectives. There are thus three aspects of social capital that are important: social networks, social norms and sanctions (the latter to ensure that any deviations from norms do not occur) (Performance and Innovation Unit, 2002).

Sociologists and economists have distinguished different types of social capital. 'Bonding' social capital links 'sameness' and enables cooperation between groups such as networks and clubs. The key characteristic of bonding social capital is that its potential power is positively related to the size of the group. But it is not always the case that 'bonding' social capital is good for an economy. For example, Olson (1982) argues that horizontal associations can hinder growth as they may encourage special interests and group lobbying for preferential policies that may impose a disproportionate cost to society. In contrast, 'bridging' social capital, which is also described as 'cross-cutting social ties' or 'weak ties' (Granovetter, 1973, 1985) concerns relations across rather than within groups, and which are less dense than the relations within bonding forms of social capital.[1] Therefore, in the presence of disparate social subgroups, bridging social capital may be needed to improve economic and social performance. In many countries, both developed and developing, such social capital is considerably under-provided and it has been argued that without such social capital, the opportunities for social exchange are lowered and the potential for destructive conflict is raised. Varshney (2000), for example, shows how the prevalence of bridging social capital has prevented religious riots in India.

### *Economics of social capital*

One of the key debates that has surrounded discussions of social capital is to what extent is it 'social' and to what extent is it 'capital'? In an important paper, Arrow (2000) questioned whether or not social capital could be construed as capital in the traditional sense of increasing economic productivity. Social capital, however, is considered 'social' in that it involves social interactions and to the extent that the effect of these interactions might have some economic persistence, one can also think of social capital as 'capital'.

There are a number of mechanisms through which social capital affects economic growth. For example, in the Solow–Swan growth model (Solow, 1956), output is a function of technology, physical capital, human capital and, in more recent vintages, social capital. In such models, social capital may affect output through changing the manner in which technology is used. It may lead to the early adoption of new innovations and, therefore, an economy may experience faster and earlier technological progress if it has high levels of social capital. Furthermore, social capital may influence the other forms of capital that affect growth. Narayan and Pritchett (2000) argued that social capital exerts a positive impact on human capital by increasing education.

Within economics, there is also a growing recognition that social capital may play a major role in explaining individual behaviour at the microeconomic level (Dasgupta and Serageldin, 2000; Durlauf and Fafchamps, 2004). In general, two approaches have been taken. One strand focuses on the implication of social capital for group behaviour within predetermined groups. For example, Akerlof (1997) and Brock and Durlauf (1999, 2001) consider the role of interactions within a group on individual and group-level outcomes; and Loury (1977) has examined social interactions within ethnic groups considering how differences in initial conditions have long-run effects. A second strand has focused on how social capital, in the form of social interactions, can lead to group formation, such as how residential neighbourhoods develop. There is a relationship between social capital and poverty traps as poverty among parents may be transmitted to children when children live in neighbourhoods with low social capital which adversely affects their subsequent economic status – thus poverty and low social capital may persist in some locations more than in others. Williams (2005) discusses how undeclared work may help to raise the level of social capital in some deprived areas. There is also a body of literature that goes beyond neighbourhoods to identify which sorts of groups produce interactions. There are studies, for example, of geographic proximity versus the impact of ethnicity by Aizer and Currie (2002), Conley and Topa (2002) and Iyer and Weeks (2005).

At the micro-level, how does social capital influence individual welfare? It does so through the externalities generated by social behaviour (Becker and Murphy, 2000). In economics, an 'externality' occurs when the benefits or costs associated with an action are dependent not only on the individual's private benefits and costs, but also on the social benefit or costs associated with that action. Frequently, this results in a 'free-rider'

problem in that those who enjoy the benefits of an action do not always bear the full costs of that action, creating a disparity between private returns and social returns. The resulting 'externality' has implications for whether or not investment will be undertaken, and if externalities are not fully taken into account, the result can be under- or over-investment. For example, economists contend that an individual's welfare depends in each period on goods and services consumed, or on household commodities produced with time and other purchased goods and services. Social capital as reflected in social forces then becomes important as it changes the environment in which individuals operate and can potentially improve their welfare. In a microeconomic sense, it is possible to consider the 'social environment' as one element in an extended utility function: so changes in this environment provide a direct way of affecting choices and behaviour by changing the utility of goods and services. Social capital may, therefore, raise or lower an individual's utility, even though the 'environment' itself is determined by the interaction of those individuals. So the externalities generated by social interaction alter an individual's welfare and consequently may alter their decision-making. For example, choosing to live in a particular neighbourhood may depend not only on an individual's income, education, occupation, distance to schools, etc., but also on the types of other people who live the area, the quality of neighbourhood interactions, the level of crime, etc. These factors are a result of repeated interactions between individuals living in that locality, which in turn have created the social environment that may influence the decision whether to reside there. In evaluating an individual's preference for living in a particular locality, one needs to take into account both the private benefit to the person from living in the neighbourhood, and the social forces that may influence this decision.

It is these ideas that cause many to ask whether one should think about social capital primarily as a system of interpersonal networks (Dasgupta, 2000; Ogilvie, 2005). As such, social capital will generate network effects and network externalities. Network effects are the direct impact of group membership, whereas 'network externalities' reflect that an individual's behaviour may be determined by the behaviour of others. For example, in employer–employee relations, social capital may affect growth if low levels of trust lead to higher monitoring costs of employees' work (to detect shirking). In many developing countries, informal associations overcome barriers provided by asymmetric information and greater trust may encourage repeated interactions that can lead to more cooperative behaviour.

Social capital as a 'system of interpersonal networks' suggests that, if correctly coordinated, it can foster both the emergence of communitarian institutions and the establishment of markets. It also indicates that the management and use of a network is important as it affects the overall resource allocation mechanism. One can define a network in terms of a unique set of beliefs and emergent institutions – this could be potentially positive as in a faith-based network or negative as in the case of rent-seeking activity or criminal organizations (such as the Mafia). As the outcomes produced by a network are not necessarily desirable, there may be a role for government to foster social capital.[2] For example, if the government acts to increase social capital, this may increase coordination among agents in an economy.[3] Raising the level of civic cooperation, for example, may then result in a higher level of output (e.g. through an increase in Gross National Product, GNP), or the better acquisition of human capital (or both).

Economists also argue that the extent to which social capital increases growth depends on the nature of network externalities. More effective cooperation by one institution in a single network may create positive externalities that spill over to other institutions and networks. The degree of spillover will be greatest if network externalities are like public goods: non-rival and non-excludable. Conversely, if network externalities are like private goods, then the benefits will be confined to the specific network and/or institution. If the character of network externalities is diffuse, social capital has an important role to play in accounting for differences in the development experiences of different countries. When such externalities are pervasive, productivity growth will tend to reflect the combination of institutional capabilities, the degree of knowledge shared publicly and the efficiency of market mechanisms (e.g. through property rights).

Recognition of the importance of externalities at the micro-level, is reflected in the macroeconomic impact of such microeconomic processes. For example, at the macro-level, social capital can generate three types of externalities that may raise the level of income. The first two types are concerned with the generation of knowledge externalities. First, 'copying' externalities, where agents 'lower down' the hierarchy copy the behaviour of those 'higher up'. A good example of this in the context of India is the phenomenon that sociologists call 'Sanskritization' – the emulation of upper-caste norms and practices by the lower castes (Srinivas, 1994). This is true of India, but equally of more developed communities elsewhere. Second, there are 'pooling' externalities, where different agents pool their knowledge making all agents improve their decision-making. This requires reciprocity and reduces opportunism as pooling externalities provide information about the reliability of agents. Third is another type of externality that reflects the increased capacity for coordinated actions, both spontaneous and conscious. Spontaneous coordination occurs through norms of both trust and distrust. Norms of coordination need have no moral content, but there is a necessity for collective decisions that require a hierarchy or a club to

enforce such norms. The capacity for coordinated actions directly raises income in many ways. For example, it introduces social sanctions, it enables management of a common pool of resources, it may help with the provision of public goods, and it increases economies of scale in non-market activities. As transaction costs fall, many activities switch from being provided by non-market mechanisms to market mechanisms.[4]

In summary, one can think of social capital as being important for growth for a number of reasons. First, at a macroeconomic level, greater social capital may lead to higher economic growth, better human capital acquisition and more efficient governance. Second, at a microeconomic level, depending upon the nature of trust or the characteristics of the network, network externalities can have either a positive or a negative impact on any, or indeed all, of these outcomes. The important point to emphasize is that social capital may have a range of impacts that may vary across time and location and, as discussed below, it may, therefore, be that analysis at the regional level provides the most useful insights.

### *Social capital: the regional dimension*

As well as the micro- and macro-dimensions, there is now a considerable body of literature, within both economic geography and economics, that focuses on the regional domain. There has been an increasing focus on regional competitiveness (Porter, 2003; Kitson *et al.*, 2004), much of which now considers social capital to be a crucial element. As Cellini and Soci (2002) argue, regional competitiveness is neither a macro- nor micro-economic (firm-based) notion as regions are neither a simple aggregation of firms nor a smaller version of nations. The importance of the region as an important unit of economic analysis can be traced to Marshall's (1920) notion of industrial districts where external economies of industrial localization were driven by skilled labour, supporting and ancillary industries, and knowledge spillovers. For Marshall, the factors that drove local competitiveness were held together by something 'in the air', which was possibly an early recognition of the importance of social capital. Marshall's framework has been developed and embellished by many with the notion of social capital being more explicitly recognized as an important factor for regional growth. According to Porter (998, 2001), a key aspect of cluster formation and success is the degree of social embeddedness, the existence of facilitative social networks, social capital and institutional structures. Storper (1995) adopts a similar approach, stressing the importance of 'untraded interdependencies' such as flows of tacit knowledge, networks of trust and cooperation, and local systems of norms and conventions.

The region can be seen as important both for the formation of social capital (which is discussed below) and for understanding its impact on growth and welfare. There are, however, a number of complex issues in analysing how social capital may affect regional growth. As discussed above, social capital is a fuzzy concept comprising a range of attitudes, norms and interactions that make it difficult to identify precisely which are the key causal factors at the regional level. Furthermore, regional externalities, or untraded interdependencies, are very difficult to identify to measure accurately. Cooke *et al.* (2005) show that social capital is an important source of competitiveness for firms in the UK (particularly innovating firms), but their results are much weaker for regions. This may reflect the difficulty of identifying regional effects since the impact of social capital may have complex impacts at different spatial scales including the international, national, regional and subregional levels. Take knowledge transfer as an example, where one can distinguish between codified knowledge (knowledge that can be encapsulated in a range of formats such) and tacit knowledge that cannot be formally codified. Codified knowledge is easily available, and although it may not be 'manna from the heavens' (Shaw, 1992, p. 611), as assumed in many growth theories, it may be easily available around the world. On the other hand, the transfer of tacit knowledge is more complex requiring shared experiences and interactions and may, therefore, need a high level of social capital to facilitate knowledge exchange, and such social capital may operate at highly localized spatial scales. According to Asheim and Gertler (2005), tacit knowledge does not travel well – an extreme example being the Allen Curve, which indicated that the effective flow of technological information within a research based organization is 50 metres (Allen, 1984). The simple point is that the effects of social capital operate and interact at many different geographical levels: individual, community, regional and, with the development of information technology, global.

It is important to consider how social capital interacts with and influences other characteristics of the region. For instance, Putnam (1993) shows that regions with higher levels of trust and civic engagement tend to have better quality government. La Porta *et al.* (1997) argue that at a national level, corruption and the quality of bureaucracy are associated with high levels of social trust. Furthermore, part of the explanation for the positive association between social capital and other factors such as crime and health may be that communities with high social capital are better administered, in part because these communities are more effective at organizing public services and have lower costs (Performance and Innovation Unit, 2002).

The importance and impact of social capital in a community or region may change over time. The case of Cambridge in the UK and the transformation of its collective capabilities have been analysed by a number of influential studies (Saxenian, 1989; Segal Quince

Wicksteed, 1985; Garnsey and Heffernan, 2005). In terms of a social capital perspective, it could be argued that deep-bonding capital was an important impetus to the initial development of technology enterprises in the Cambridge area with a few key individual entrepreneurs and others from the business community developing very strong relationships. As the knowledge-based economy expanded and reached critical mass, the importance of this type of social capital has waned. The advantage of a larger technology-based local economy is that a specialized local labour market and supply chain have developed and in terms of social capital the 'weak ties' of bridging capital have become more important. That said, it may be the case that the failure to develop effectively sufficient bridging social capital is a constraint on the growth of high-technology industries in the Cambridge area. Kitson and Primost (2005) argue that many of the biotechnology firms in the Cambridge area do not participate in, or feel isolated from, the local networks that have developed. Furthermore, the attempts to remedy this deficiency are too focused on local network development when increasingly it is national and international networks that need to be strengthened. The generalizable issue is that the impact of different types of social capital vary across both space and time – and there may be a potential problem for areas if they are over-dependent on types of social capital that do not facilitate future growth (Grabher, 1993). Furthermore, the variability of such impacts makes it difficult to identify the magnitude of the impact of social capital. For instance, social capital may have a direct impact on output, but it may also affect factors (such as the quality of labour and the pace of innovation) that influence output in the future – and additionally the size of such impacts may vary by location.

## EMPIRICS OF SOCIAL CAPITAL

Social scientists have adopted various approaches and methodologies to measure social capital. In order to measure social capital appropriately, one needs a range of indicators at both the micro- and macro-levels, but there are significant empirical difficulties. At the microeconomic level, direct valuation of social capital is not possible – not least because it is not transacted in a market. At the macroeconomic level, the empirical difficulties become magnified as there is the assumption of 'sameness' in many growth models – as any indicator of social capital is assumed to have the same impact across regions or countries (whichever is the unit of analysis) (Kitson, 2005a). Furthermore, growth models are hampered by how to interpret the 'residual' generated by such models – is it technological progress, entrepreneurship or the impact of social capital that is not adequately captured as an independent variable? Due to the empirical limitations, three types of 'revealed' social capital are often used: population data (such as membership numbers), attitudinal data and participation data. The selection depends upon the breadth of institutions involved or the types of impact that social capital is expected to have on the development process. In this study, and as set out in the fourth section, attitudinal and participation data on social capital have been examined.

Empirical studies of social can be divided into two: 'narrow' and 'broad' studies. Typically, for narrow studies, social scientists have looked at civic associations: how and by whom they are created. In these studies, social capital is measured as membership of groups and networks. For example, Putnam (2000) measures involvement in community life, voting patterns, informal socializing, volunteer activity and interpersonal trust. Putnam (1993) explains Northern Italy's economic success relative to Southern Italy as a consequence of a higher density of voluntary associations among people in the North. Helliwell and Putnam (2000) examine the growth rates of regions in Italy before and after the reform of the regional government in Italy in the 1970s, which created a local regional tier of government. Before these reforms, the Northern regions were richer due to better social capital, and after the reforms the Northern regions continued to outperform those in the South.

Social capital has also helped in the development process in less developed countries and transition economies. Narayan and Pritchett (2000) show that in Tanzania and India, village-level social capital was important for household welfare and they found that household-level social capital was less significant than village-level social capital. In Somalia, after the fall of the government in 1991, incomes declined everywhere except the port city of Boosaaso, where a council of clan elders, with the support of local people, improved trade and income.

Another example is group-based lending schemes, such as the Grameen Bank in Bangladesh or the Tontine in West Africa, which have proved remarkably successful for development. In the state of Gujarat in India, violent conflicts between local people and government officials over forest management had led to economic stagnation. In response, communities were mobilized, and joint forest management was instituted. As a consequence, conflicts declined and land productivity and village incomes rose.

In the transition economies in Eastern Europe and the former Soviet Union, the disappearance of formal government in the late 1980s and early 1990s led to a collapse of trust and greater reliance on local networks and informal associations. A Russian proverb cited frequently at the time – 'A hundred friends are worth more than a hundred roubles' – epitomizes the importance of these local networks.

Empirically, one of the simplest and most common measures of social capital has been reported levels of trust in others. Such measures have been used in broader

studies of social capital that have used survey data. For example, studies using World Value Survey data show that trust is most important in low-income countries, where it operates as a substitute for formal institutions that enforce property rights and contracts (KNACK and KEEFER, 1997). LA PORTA *et al.* (1997) report only a weak association between their trust index variable and growth. HELLIWELL (1996), in contrast, finds trust and group membership have a significant negative effect upon productivity growth in a sample of 17 OECD countries. There are also several cross-country studies that have examined the effect of human and social capital upon output per capita, including those by BARRO and SALA-I-MARTIN (1995), HELLIWELL (1996), KNACK and KEEFER (1997), LA PORTA *et al.* (1997) and DASGUPTA (2000). In these studies, growth is typically explained by factors such as education, initial Gross Domestic Product (GDP), investment and social capital indicators. KNACK (2000) found a positive relationship between trust and investment. PUTNAM *et al.* (1993) found a link between the higher economic development in the North of Italy relative to the South and higher membership of groups and clubs. DASGUPTA (2000) considered cultural beliefs as a form of social capital and investigated the importance of civic culture and personal motivation on growth. Using the evidence of others (PUTNAM, 1993; KNACK and KEEFER, 1997; LA PORTA *et al.*, 1997), Dasgupta suggested that there is a positive relationship between civic culture and economic growth. Similarly, GRANATO *et al.* (1996) found positive links between personal motivation and economic growth.

The empirical studies of social capital have provided important insights. However, as argued above, the impact of social capital is likely to vary across space and this suggests that those results drawn from cross-country studies should be treated with caution.

## LIMITATIONS OF SOCIAL CAPITAL

In addition to spatial variations, one of the main problems with many studies is that social capital may have multiple impacts that are difficult to disentangle. Amongst the many variables it may influence are growth (KNACK and KEEFER, 1997), innovation (MACGILLIVRAY, 2002; COOKE *et al.*, 2005; GARNSEY and HEFFERNAN, 2005; TURA and HARMAAKORPI, 2005), happiness (BROWN and HARRIS, 1998) and health (KENNEDY *et al.*, 1990; BERKMAN and GLASS, 2000). Such multiple outcomes may be interlinked, reinforce or conflict with one another. For instance, to the extent that social capital improves the ability of firms to innovate, then it would be a reasonable presumption that this would lead to higher economic growth in the future. Whereas investing significant time in civic engagement may improve the health and happiness of individuals, this could be potentially at the cost of less time working (with a subsequent negative impact on output). Such issues create problems for robust empirical analysis. Simply, what is the dependent variable? Is it economic growth (change in GNP, GDP or similar measures), innovation (itself difficult to measure), human capital, health, happiness, etc.

Furthermore, even if one restricts the analysis to economic growth (change in GNP, GDP or similar measures), the mechanisms through which social capital may have an effect are still relatively unclear. For example, it is argued that social capital can lead to more effective public services (PUTNAM, 1993) as people take more responsibility for voting. Social capital may act as informal insurance (ARNOTT and STIGLITZ, 1991), reducing the impact of missing markets in insurance provided by the private and public sectors (DASGUPTA, 2005). A recent theory of social capital argues that small changes in social capital may have a significant impact on an economy, suggesting that there may be a non-linear relationship between social capital and economic performance. More recent studies have also highlighted that there may be a 'dark side' to social capital: that institutions that were based on social capital have been used as well as abused in the past to discriminate against certain groups in society, and that there is evidence for this from the historical experience of now-industrialized countries (OGILVIE, 2005).

Much of the recent empirical analysis has been unable to quantify adequately the size of the effect of social capital on economic outcomes. This failure may reflect the difficulty of dealing with multiple mechanisms and multiple potential outcomes as discussed above. It also reflects the econometric problems that frequently plague social capital variables such as their potential endogeneity, omitted variables bias, and the difficulty of finding good instrumental variables that will allow us to identify the effect of social capital separately to the effect of other determinants of economic growth (DURLAUF, 2002).[5] The limitations of such studies suggest that account needs to be taken of local variations and local impact of social capital.

## DETERMINANTS OF SOCIAL CAPITAL: THE CASE OF THE USA

This section evaluates the determinants of social capital. As argued above, to gain useful insights, what is required is an understanding of spatial variations. To support this, the case of the USA is examined using social capital data from the Social Capital Community Benchmark Survey 2000, which provides social capital data for 24 384 individuals who live in 40 communities, grouped into nine broad regions. These data were collected by a telephone survey of households asking questions that permitted the construction of a wide variety of social capital indicators. A description of these data and the questions on which they are based are shown in Table 1.

This section uses eight different measures of social capital indicators in successive bivariate and multivariate

*Table* 1. *Summary of social capital indicators*

| Social capital indicator | Overview of questions |
|---|---|
| Social trust | Can most people be trusted?<br>How much you can trust: people in your neighbourhood, people you work with, people at your church or place of worship, people who work in the stores where you shop, the police in your local community? |
| Racial trust | Do you trust ethnic group X a lot, a little or not at all? |
| Civic participation | Did you vote in the previous election?<br>Have you participated in signing a petition, attended a political meeting or rally, worked on community project, signed a petition, participated in boycotts, demonstrations, protests or marches? |
| Diversity of friendship networks | Which of the following types of people do you have a personal friend: owns a business, is a manual worker, on welfare, owns a vacation home, has a different religious orientation, is white, is Latino or Hispanic, is Asian, is black or African-American, is gay or lesbian, is a community leader? |
| Group involvement (not including church) | Which of the following groups are you a member of: sports club, youth group, parent association, veterans group, neighbourhood association, seniors group, charity, labour union, participate in business as a group, ethnic organization, political, art, hobby, self-help, Internet and other? |
| Faith-based social capital | Are you a member of a church?<br>Do you attend church service?<br>Do you participate in non-religious church service?<br>Are you affiliated with non-religious church service groups? |
| Organized interactions | Have you attended public meetings?<br>Have you attended club meetings?<br>Have you attended local community events? |
| Informal social interactions | How often do you play cards or board games with others?<br>How often do you have friends over to your house?<br>How often do you socialize with friends in a public place?<br>How often do you socialize with co-workers outside of work?<br>How often do you visit relatives? |

*Note:* For each type of indicator, the data have been categorized according to whether the individual has low, medium or high levels of social capital (for some categories, the data are split into four groups: very low, low, medium and high). These categories are of similar size but have been adjusted to take account of the impact of clustering of some of the observations (for further information, see ROPER CENTER, 2001).

analyses: social trust, racial trust, civic participation, ethnic diversity of friendship networks, group involvement (not including church activity), organized interactions, faith-based social capital and informal social interactions. For each indicator, the data have been categorized according to whether the individual has low, medium or high levels of social capital (for some categories, the data are split into four groups: very low, low, medium and high). These categories are of similar size, but each has been adjusted to take account of the impact of clustering of some of the observations (for further information, see ROPER CENTER, 2001). Information was also gathered about the individuals with respect to their age, gender, education, economic status and health.

### *Geographical patterns of social capital in the USA*

As PUTNAM's (1993) study of Italy showed, a country can have significant geographical variations in social capital (see also the analysis of the European regions by BEUGELSDIJK and VAN SCHAIK, 2005; and the study of communities in Australia by WESTERN *et al*., 2005). This section examines the spatial pattern of social capital in the USA.[6] Subsequent sections examine whether such patterns can be can be explained by variables that may vary by location (such as education, income and employment) and whether after taking account of such variables there are further geographical variations that may reflect the unique spatial characteristics of a location.

As shown in Table 2, the pattern of social capital varies considerably across the 40 communities in the sample. For instance, whereas rural South Dakota is the highest ranked community for social trust, faith-based social capital and organized interactions, it only has a mid-ranking in terms of group involvement and informal interactions, and it is the lowest for the diversity of friendship networks. Boulder County, Colorado, has the highest ranking for civic participation and group involvement, and has a relatively high rank for social trust, but it has very low rankings for faith-based social capital and racial trust. Baton Rouge, Louisiana, which has suffered tragic consequences in the aftermath of hurricane Katrina, is ranked very highly in terms of faith-based social capital and group involvement, but it is very low in terms of social trust and racial trust. A notable feature is the generally low ranking of Boston, Massachusetts, across most of the social capital variables (this is discussed more fully, albeit with a rather positive 'spin', in BOSTON FOUNDATION, 2001).

One of the interesting features of the data is that those communities that are highly ranked in terms of social trust are also highly (and statistically significantly) ranked in terms of civic participation, organized interactions and informal social interactions – but the rank correlations with the other social capital variables are not significant.[7] Communities highly ranked in terms of civic participation are likely to be highly ranked in terms of other social capital variables – although the rank with racial trust is not statistically significant and it is negative (and statistically significant) when compared with the ranks for faith-based social capital. The social capital in communities with high faith-based social capital suggests the latter is noticeably different to

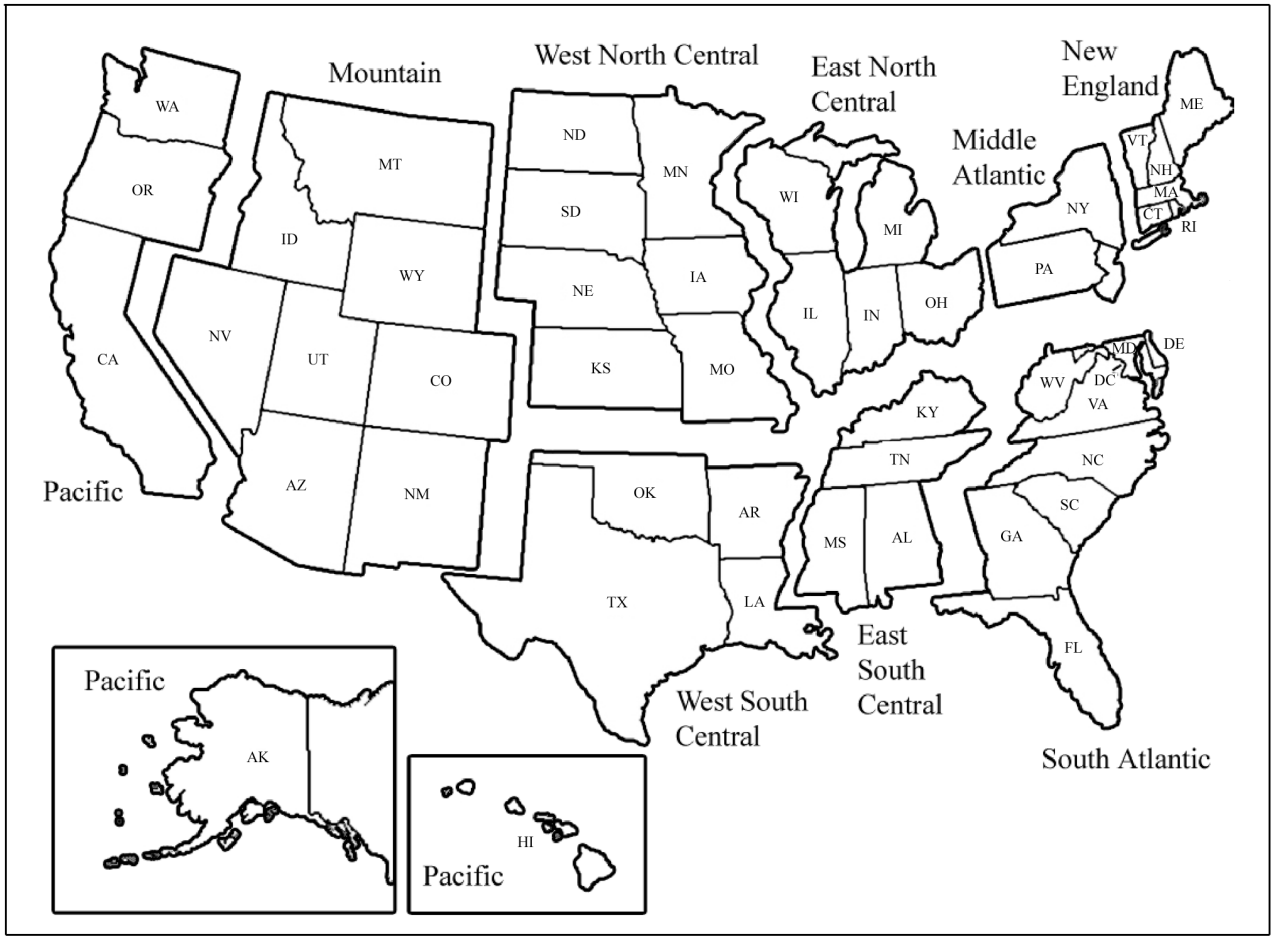


*Fig.* 1. *Regions of the USA*

other forms of social capital. For instance, communities highly ranked in terms of faith-based social capital are likely to be low (and statistically significantly) ranked in terms of racial trust, civic participation and diversity of friendship networks. It seems that faith-based activities are a form of bonding social capital, and in communities where it is important, other forms of bridging social capital such as civic engagement, and perhaps most importantly trust of other ethnic groups, tend to be low.

To examine the geographical variations in social capital more fully and to evaluate whether the variations are statistically significant, the 40 communities were allocated according to nine regions of the USA based on US Census Divisions (Fig. 1).[8] As shown in Table 3, there are large variations in social trust across the US regions. For instance, 49% of the sample from West North Central has high social trust compared with only 25% of the sample from West South Central.

The data suggest that the geographical pattern of social capital is complex and varied across the US regions. For example, Table 3 shows there are statistically significant differences in the level of social trust between most regions in the USA. Although the tables are not reported here, there are also consistent and pervasive regional differences in civic participation, racial trust and faith-based social capital.[9] For example, 34 of the 36 regional comparisons for faith-based social capital are statistically significantly different from each another. There are significant regional variations for the other indicators of social capital, although the patterns are variable. For instance, in terms of the diversity of friendship networks, the Mountain and the Pacific regions (both regions with a high diversity of friendships) are statistically different to all other US regions, whereas West North Central is only statistically different from three of the eight other regions. The social capital variable that shows the least extent of regional variation is organized interactions – but even here, 18 of the 36 regional comparisons are statistically significantly different from one another.

### *Socio-economic determinants of social capital*

According to Glaeser (2001, p. 40): 'The formation of social capital is a crucial topic for both positive social science and for the policy agenda of improving the level of social capital'. This section considers the main

*Table 2. Rankings of communities by social capital*

| Community | Region | Number of observations | Social trust | Racial trust | Civic participation | Diversity of friendship networks | Group involvement (not including church) | Faith-based social capital | Organized interactions | Informal social interactions |
|---|---|---|---|---|---|---|---|---|---|---|
| Rural South Dakota | West North Central | 368 | 1 | 9 | 10 | 40 | 16 | 1 | 1 | 26 |
| Bismarck, North Dakota | West North Central | 506 | 2 | 37 | 20 | 39 | 24 | 6 | 4 | 3 |
| Montana | Mountain | 501 | 3 | 15 | 6 | 18 | 20 | 24 | 2 | 11 |
| New Hampshire | New England | 704 | 4 | 14 | 7 | 15 | 25 | 33 | 10 | 14 |
| St Paul Metro, Minneapolis | West North Central | 502 | 5 | 5 | 14 | 16 | 19 | 11 | 13 | 29 |
| Fremont/Newaygo County, Michigan | West North Central | 751 | 6 | 25 | 22 | 27 | 35 | 13 | 19 | 4 |
| Boulder County, Colorado | Mountain | 500 | 7 | 35 | 1 | 2 | 1 | 39 | 3 | 10 |
| Seattle, Washington | Pacific | 501 | 8 | 6 | 2 | 1 | 5 | 38 | 7 | 18 |
| York, Pennsylvania | Mid Atlantic | 498 | 9 | 1 | 38 | 30 | 38 | 23 | 38 | 23 |
| Central Oregon | Pacific | 498 | 10 | 34 | 13 | 23 | 21 | 37 | 6 | 17 |
| Minneapolis, Minnesota | West North Central | 499 | 11 | 16 | 5 | 5 | 11 | 26 | 15 | 6 |
| Kalamazoo County, Michigan | East North Central | 498 | 12 | 20 | 8 | 7 | 10 | 18 | 9 | 2 |
| Indiana | East North Central | 996 | 13 | 21 | 32 | 28 | 29 | 14 | 18 | 5 |
| Peninsula–Silicon Valley, California | Pacific | 1490 | 14 | 12 | 35 | 8 | 30 | 35 | 36 | 36 |
| Lewiston–Auburn, Maine | New England | 522 | 15 | 18 | 11 | 34 | 40 | 34 | 28 | 1 |
| Cincinnati Metro, Ohio | East North Central/ East South Central | 997 | 16 | 31 | 31 | 35 | 26 | 15 | 16 | 15 |
| Syracuse/Onondaga County, New York | Mid Atlantic | 540 | 17 | 4 | 12 | 21 | 17 | 22 | 14 | 8 |
| Grand Rapids City, Michigan | East North Central | 502 | 18 | 24 | 16 | 10 | 7 | 9 | 20 | 16 |
| Delaware | South Atlantic | 1367 | 19 | 29 | 29 | 17 | 14 | 20 | 32 | 27 |
| Kanawha Valley, West Virginia | South Atlantic | 499 | 20 | 19 | 15 | 33 | 33 | 16 | 24 | 24 |
| East Tennessee | East South Central | 499 | 21 | 26 | 28 | 38 | 31 | 8 | 27 | 13 |
| Winston–Salem/Forsyth County, North Carolina | South Atlantic | 749 | 22 | 3 | 30 | 25 | 15 | 4 | 33 | 38 |
| Rochester Metro, New York | Mid Atlantic | 988 | 23 | 10 | 33 | 22 | 34 | 25 | 30 | 20 |
| Birmingham Metro, Alabama | East South Central | 498 | 24 | 38 | 25 | 31 | 8 | 3 | 12 | 30 |
| Phoenix/Maricopa County, Arizona | Mountain | 499 | 25 | 11 | 37 | 12 | 36 | 28 | 34 | 21 |
| Detroit Metro, seven counties Michigan | East North Central | 497 | 26 | 27 | 17 | 29 | 12 | 12 | 26 | 9 |
| Charlotte region/ 14 counties, North Carolina | South Atlantic | 1493 | 27 | 33 | 36 | 24 | 18 | 5 | 35 | 33 |
| Yakima, Washington | Pacific | 496 | 28 | 2 | 26 | 26 | 37 | 29 | 17 | 12 |
| Greensboro/Guilford County, North Carolina | South Atlantic | 749 | 29 | 23 | 19 | 19 | 6 | 7 | 21 | 31 |
| San Diego County, California | Pacific | 503 | 30 | 8 | 34 | 14 | 27 | 31 | 29 | 34 |
| San Francisco City, California | Pacific | 497 | 31 | 7 | 3 | 3 | 3 | 40 | 8 | 19 |
| Denver City, Colorado | Mountain | 498 | 32 | 28 | 4 | 6 | 9 | 30 | 22 | 25 |
| Baton Rouge, Louisiana | West South Central | 499 | 33 | 39 | 27 | 13 | 2 | 2 | 5 | 7 |
| Chicago Metro, Illinois | East North Central | 747 | 34 | 32 | 23 | 32 | 22 | 21 | 23 | 32 |

*Table 2. Continued*

| Community | Region | Number of observations | Social trust | Racial trust | Civic participation | Diversity of friendship networks | Group involvement (not including church) | Faith-based social capital | Organized interactions | Informal social interactions |
|---|---|---|---|---|---|---|---|---|---|---|
| Cleveland/Cuyahoga County, Ohio | East North Central | 1096 | 35 | 30 | 24 | 36 | 23 | 19 | 25 | 28 |
| Atlanta Metro, Georgia | South Atlantic | 505 | 36 | 40 | 21 | 11 | 4 | 10 | 31 | 35 |
| Houston/Harris County, Texas | West South Central | 499 | 37 | 22 | 40 | 37 | 39 | 17 | 40 | 40 |
| Los Angeles County, California | Pacific | 512 | 38 | 17 | 39 | 20 | 28 | 27 | 37 | 39 |
| North Minneapolis, Minnesota | West North Central | 450 | 39 | 13 | 9 | 4 | 13 | 32 | 11 | 22 |
| Boston City, Massachusetts | New England | 597 | 40 | 36 | 18 | 9 | 32 | 36 | 39 | 37 |

*Note:* Numbers are observations based on social trust.
*Source:* See Table 1.

*Table 3. Social trust by region*

| Level of social trust | New England** | Mid Atlantic** | East North Central** | West North Central** | South Atlantic** | East South Central** | West South Central** | Mountain** | Pacific** | Total |
|---|---|---|---|---|---|---|---|---|---|---|
| Low | 609 | 796 | 2021 | 550 | 2115 | 428 | 585 | 577 | 1570 | 9251 |
| | (31.04) | (32.31) | (31.56) | (21.72) | (35.55) | (32.01) | (43.3) | (26.4) | (31.92) | (31.79) |
| Medium | 617 | 806 | 2048 | 745 | 1886 | 467 | 428 | 738 | 1624 | 9359 |
| | (31.45) | (32.71) | (31.98) | (29.42) | (31.7) | (34.93) | (31.68) | (33.76) | (33.02) | (32.16) |
| High | 736 | 862 | 2335 | 1237 | 1948 | 442 | 338 | 871 | 1724 | 10 493 |
| | (37.51) | (34.98) | (36.46) | (48.85) | (32.74) | (33.06) | (25.02) | (39.84) | (35.05) | (36.05) |
| Total | 1962 | 2464 | 6404 | 2532 | 5949 | 1337 | 1351 | 2186 | 4918 | 29 103 |
| | (100) | (100) | (100) | (100) | (100) | (100) | (100) | (100) | (100) | (100) |

*Notes:* Frequency is given in parentheses.
**All significant at the 5% level except for: New England versus Mid Atlantic; New England versus Pacific; Mid Atlantic versus East North Central; Mid Atlantic versus East South Central; Mid Atlantic versus Pacific; South Atlantic versus East South Central; and East South Central versus Pacific.
*Source:* See Table 1.

determinants of social capital in the USA. Analysis is based on data for 2000, and against this backdrop it should be noted that the level of social capital has been declining steadily in the USA since the early 1960s (Putnam, 2000). A persistent declining trend is apparent in terms of both civic engagement and attitudinal measures such as social trust. Whereas two-thirds of Americans attended club meetings in the mid-1970s, by the late 1990s, two-thirds never attended (Performance and Innovation Unit, 2002). It may be that the person who once bowled alone now does not go bowling at all. There have been declining levels of political engagement that have not been offset by activity in single-issue movements (such as poverty, civil rights and environmental groups). The level of interpersonal trust has fallen from 55% in 1981 to 33% in 1998, and the levels are particularly low amongst the young (Putnam, 2000).

In keeping with the theoretical discussion of social capital, the categorization of the data on different types of social capital is as follows. First, that which is based on *trust* – beliefs that may be the product of previous investment such as education but probably do not require continual investment in terms of resources or time.[10] Second, social capital based on *networks and interactions* – that do require continual investment in terms of resources, time, or both. Third, *faith* – beliefs that, depending on the religion, may require continual investment in terms of resources, time or both. A range of variables that may influence these different forms of social trust, the choice of which has been based on those variables identified in the literature and by an examination of patterns in the data, are now examined.

### *Education*

One of the most consistent results is the strong association between education (human capital) and indicators of social capital (Hall, 1999; Putnam, 2000), and this association seems pervasive across a wide range of countries (Glaeser *et al.*, 2002). There is a range of possible explanations for this apparently robust result. First, education requires the development of social skills that enable the development of social capital. In some

ways, education can be considered as providing the initial investment in social capital – working in groups, learning to cooperate, and understanding the needs and attitudes of others. Thus, it provides a stock of individual social capital that can be built on in the future – and the skills developed make it less costly or difficult to invest in additional social capital after formal education has ceased. Second, in education individuals learn that others can be trusted and that cooperation, networks and engagement can provide positive benefits. To the extent that education is a societal activity, then individuals learn the benefit of being in a society. Third, individuals who are more forward-looking may invest in *both* social and human capital.

In this study, education is measured by the levels of educational attainment grouped in seven levels: less than high school, high school, some college, associate degree, bachelors, some graduate training, graduate or professional degree. There is a strong association between educational attainment and social capital in the USA.[11] Those who had left education before high school were three times as likely to have low social trust compared with those who had a graduate or professional degree. Conversely, those with a graduate or professional degree were three times as likely to have high social trust compared with those who had left before high school. Similar relationships are apparent with other measures of social capital. For instance, 43% of those who had left education before high school had low racial trust – which was more than four times higher than those who had a graduate or professional degree.

The education–social capital relationship has important implications for public policy (see below) and for understanding economic growth. Traditional economic models have explained growth as being determined by capital, labour, human capital and technological progress (either exogenously or endogenously determined). More recent vintages have incorporated some indicator of social capital that has been identified as an important determinant of economic growth (Knack and Keefer, 1997). Such models, however, assume that human and social capital are independent variables, whereas the data in this and other studies show that they are highly interdependent. When analysing growth models, it is, therefore, not possible to ascertain whether education is beneficial because it raises skills or because it improves social capital – or both.

### *Mobility*

The incentive to join networks will be influenced by how long benefits accrue to the individual – and, as pointed out in Glaeser (2001), as the expected duration of an investment declines, the amount of investment will also decline. Thus, to the extent that networks are local, it may be expected that geographical mobility will discourage investment in this form of social capital. Simply, it is not worth putting down roots such as joining the bowling club if one is likely to leave the area soon. Conversely, if networks are not spatially influenced (such as web-based communities), then geographical mobility should not discourage such investment. Furthermore, geographical mobility may not influence trust-based social capital if such trust is solely determined by previous investments and does not require new investments. That said, when joining a new community, some individuals may be trust-adverse until they get to understand the norms and behaviour of that community, i.e. some new investment is required.

According to DiPasquale and Glaeser (1999), duration in the community has a significant positive impact on the formation of social capital. And according to Glaeser *et al.* (2002), there is a significant positive relationship between this probability of moving and membership in organizations. Data on two social capital variables – civic participation and social trust – according to the time spent living in the community, yield interesting facts about mobility and social capital.

The present study measures the number of years living in a community, as grouped into six categories: less than 1 year; 1–5 years; 6–10 years; 11–15 years; more than 15 years; and all my life. In the USA, there is strong association between civic participation and the time spent in the community. For instance, civic participation is very low for 29% of those who have been living in a community for less than 1 year and it falls to 23% for those living in an area for between 1 and 5 years. Conversely, civic participation is very low for only 9% of those who have lived in a community for more than 15 years – and 24% of this group have engaged in high civic participation. Interestingly, civic participation is lower for the members of the group who has lived in an area for all their life compared with those who have lived in the area for 15 years or longer. This may reflect the impact of age (discussed below) or indicate that some limited mobility and some experience of living in other communities encourages civic engagement. There is also an association between social trust and time spent living in the community (although many of the differences are not statistically significant).[12]

### *Labour market participation*

Participation in the labour market may influence the level of social capital. In particular, the workplace may be a place where social capital develops and it may be a source of networks and other forms of social engagement. Furthermore, work as a source of income may provide the resources to facilitate the investment in social capital (see below). This study examines the labour status of the individual as grouped in seven categories: working; temporarily unemployed; unemployed; retired; permanently disabled; homemaker; and student. In the multivariate analysis below, employment status was measured as a dummy variable to

determine if the individual is employed. Students, those currently working and the retired are grouped with the employed group, while those not working, permanently disabled and homemakers are grouped with the unemployed group.

The level of social trust according to participation in the labour market shows that 35% of those in employment have high levels of social trust compared with only 22% of those unemployed. The group with the highest level of social trust is the retired – and one of the groups with the lowest levels is the student group. This probably reflects the impact of age (see below) – the old (except for the very old) have higher social capital than the young.

PUTNAM (2000) suggested that work intensity has a negative impact on social engagement due to pressures on time. Analysis of the data on hours worked does suggest that those who work very long hours (60 hours or more per week) have lower levels of social trust, racial trust and civic participation compared with those working fewer hours per week.

### *Age*

Networks, relationships, and friendships accumulate and develop with age and, therefore, it can be expected that the level of social capital will increase with age. Therefore, it could be expected that those communities comprising older people will have higher levels of social capital than those who have a higher proportion of younger people. There are two important caveats to this proposition. First, investment in social capital may decline in very old age. Those who believe in the power of utility maximizing behaviour suggest that when individuals are closer to death, they eschew investment in social capital as the potential benefits are reduced (GLAESER *et al.*, 2000). An alternative explanation is that older citizens lack the physical strength and mobility to engage in many forms of social interactions (an economist may explain this in terms of the increased cost of investing in social capital). Second, to the extent that social capital influences economic growth, this affect may be less important for those older citizens who are not working and are, therefore, not directly contributing to output.

This study controls for the effect of the individual's age. The data show a very strong positive association between age and social trust. Those who are 65 years and older are more than twice as likely to have high social trust compared with the 18–34-year age group. Similar results are found across other indicators of social capital, although those who are older than 65 years are less likely to engage in group involvement.

### *Income*

Income may influence social capital through various mechanisms. First, there are financial costs to joining some networks and groups. Second, a high income may reflect that individuals are working in occupations that require high levels of social contact. In particular, many high-level jobs in the service sector require high levels of social interaction and the use and exploitation of personal networks. This study controls for economic status by taking the level of household income grouped in six categories: less than US$20 000; US$20 000–29 999; US$30 000–49 999; US$50 000–74 999; US$75 000–99 999; and US$100 000 or more. The propensity to have a low level of social trust declines consistently with household income, whereas the propensity to have a high level of social trust rises with household income. Similar findings are evident with other indicators of social capital, although there seems to be a threshold effect (in the US$30 000–74 999 range) before social capital increases.[13]

### *Home ownership*

Home ownership is closely linked with the quality of the community and it potentially encourages the development of social capital. DIPASQUALE and GLAESER (1999) found strong positive associations between home ownership and a range of social capital variables, including membership of non-professional organizations, voting in local elections and church attendance (including gun ownership!).[14] The present paper also examines whether an individual owns or rents their house; the home ownership variable takes the value 1 if the house is owned by the individual, and zero otherwise. The association between home ownership and social trust in the USA shows that those who own their own home are nearly twice as likely to have high levels of social trust compared with those who rent their property. With all other indicators of social capital, homeowners have higher levels compared with those who rent – the one exception is informal social interactions.

### *Social capital in urban and rural areas*

Social capital may vary according to degree of urbanization of any area, although the impact could be positive or negative. The benefit of living in an urban area is that it may offer many opportunities to join organizations and networks and to engage in civic participation. Alternatively, there is the possibility that the alienation associated with living in some urban areas leads to low levels of trust and other forms of social capital.

Since the present concern is the impact of social capital at the local level, the paper also examines the extent to which social capital varies between urban and rural areas (based on four categories from urban to rural[15]). The evidence from the USA suggests there is a negative relationship between the degree of urbanization and the level of social trust. For instance, only 32% of those living in a city centre have a high level of social

trust compared with 46% of those living outside the metropolitan area. Similarly, racial trust and faith-based trust are lower in urban areas, but the differences in many of the other indicators (such as civic participation) are not large.

*Ethnic diversity*

There is emerging and disturbing evidence that locations that have an ethnically diverse population have low levels of social capital. The causes of this controversial result are difficult to find. According to Alesina and La Ferrara (2000), ethnic heterogeneity decreases social participation in the USA. Their model suggests that if individuals discriminate against those who are different to them, then they are less likely to participate in social interactions when their area (in their analysis it is US states) is ethically diverse. According to Glaeser (2001), the formation of social capital requires coordination, and such coordination is more problematic when people are different. Part of the problem may reflect the natural risk aversion of many individuals. Simply, we are frightened of who or what we do not understand.

A key aspect of ethnic diversity is that it is of concern to developing and developed countries alike. For example, recent studies have shown that many of the world's poorest countries score very highly on ethnic fractionalization – more than half of the world's poor countries have experienced ethnic conflict in the last decade. Of these, 30 have had greater than 10% of their population dislocated; in ten countries there are less than 40% dislocated. Easterly and Levine (1997) found ethnic diversity accounted for approximately 35% of Africa's growth differential with the rest of the world. Studies of India have shown that ethnoreligious conflicts are frequently a manifestation of socio-economic disparities (Iyer, 2002).[16] There is a recent class of economic models that examines how ethnic diversity might contribute to rent-seeking within society, affecting the actions of the state, particularly the allocation of public goods. These models suggest that polarized societies will be more prone to rent-seeking by competitive groups who will waste resources and will find it difficult to agree on the allocation and distribution of public goods such as infrastructure (Shleifer and Vishny, 1993; Alesina and Rodrik, 1994). For example, Poterba (1996) found evidence of ethnic diversity affecting public goods choice – in this study, a larger fraction of the elderly in the population, particularly when they are from varied ethnic groups, leads to lower spending on education. Another study of a sample of US cities showed that roads, schools and libraries frequently received less funding when there was higher ethnic diversity (Alesina *et al.*, 2003). Ethnic diversity may, therefore, have critical implications for state action, with particular consequence for regional development.

In this study ethnic diversity is measured as follows:

$$1-((\text{Percentage of Whites})^2+(\text{percentage of Blacks})^2+(\text{percentage of Hispanics})^2+(\text{percentage of Asians})^2+(\text{percentage of other ethnic groups})^2)$$

Using this measure, the data show that both social trust and racial trust are lower in ethnically diverse US communities. Furthermore, those who live in ethically diverse communities are less likely to trust others in their neighbourhoods, their colleagues at work and those from their own ethnic group. Additionally, those who live in more diverse communities have fewer friends, and are less likely to participate in politics.

## EXPLAINING REGIONAL VARIATIONS OF SOCIAL CAPITAL IN THE USA

The above analysis suggests there are a range of factors that contribute to the variations in social capital across the USA. This section uses multivariate analysis to evaluate the significance of these factors, disentangle their relative importance and see whether there is an independent location effect. Furthermore, it examines separately the factors that determine each type of social capital in the USA.

The methodology adopted is ordered logit regression analysis (McFadden, 1973, 1984; Heckman, 1976; Heckman and Willis, 1976). In logit estimation, it is hypothesized that the probability that an event occurs is determined by the function:

$$p_i = F(Z_i) = \frac{1}{1+e^{-Zi}} \tag{1}$$

The marginal effect of $Z$ on the probability is denoted by:

$$f(Z) = \frac{dp}{dZ} = \frac{e^{-Z}}{(1+e^{-Z})^2} \tag{2}$$

This is given by the derivative of this function with respect to $Z$. The model is fitted by maximum likelihood estimation, which uses an iterative process to estimate the parameters. To describe the effect of a particular explanatory variable on the probability of occurrence of the event, the usual method used is to calculate the marginal effect at the sample mean, i.e. at the mean of the explanatory variable used in the model. When more than one explanatory variable is used (as in the models presented below), the marginal effects are calculated by multiplying $f(Z)$ by the estimates of the coefficients of the logit regression. Tables 4–11 show the elasticities, standard errors and probability that the variables are significant. Elasticities are calculated from the marginal effect in order to estimate the probability of the effect of the independent regressors on the dependent variable. These elasticities are reported for the various social capital variables divided

into the categories low, medium and high, respectively, or in some cases as specified into the categories very low, low, medium and high.

The variables chosen are based on the discussion in the fourth section: education, place of residence, age, income, employment, home ownership, ethnic diversity, urban–rural variation, and fixed effects for the following eight US regions using dummy variables: New England, Mid-Atlantic, East North Central, South Atlantic, East South Central, West South Central, Mountain, and Pacific (West North Central acts as the reference category for the region dummy variables). Also examined are income squared (inc1sq) to consider possible non-linear effects as the very rich may not have time to invest in social capital or their income may reflect single-minded entrepreneurial drive that may not be consistent with a high level of social capital. Additionally, an age variable squared (agesq) is used to account for the difficulty of investing in social capital for the elderly.

Also analysed is an alternative specification using community dummies to allow for a finer degree of geographical disaggregation. Using this specification, there are a large number of communities that have significant differences in social capital after taking account of other variables, although the results are not reported here.[17] The main reason for not doing so is the concern that using community dummies creates statistical limitations, specifically with respect to multicollinearity, as it is not possible to use the ethnic diversity indicator with the community dummy variable in the regression analysis. This is because the dummy variables capture both the specific characteristics of the region not reflected by the other variables and the ethnic diversity of the community, and it is difficult to disentangle these two effects separately and empirically. As one of the issues of particular interest is the question of ethnic diversity, only the ordered logit regression results with fixed effects for the eight regions relative to the base region (North West Central) are therefore reported.

### *Social trust*

The questions on social trust were as follows:

> Can most people be trusted? How much you can trust: people in your neighbourhood, people you work with, people at your church or place of worship, people who work in the stores where you shop, the local news media, the police in your local community?

The responses to these questions were grouped as low, medium and high (see above). As shown in Table 4, there are several variables that are key determinants of social trust in the USA. First, education is very important with a one-level increase in education resulting in a 5.7% decrease in the probability that an individual had low social trust, and a 5.3% increase in the probability that the individual had high social trust. Collectively, this suggests that better education leads to a greater willingness to trust others. Similarly, if an individual was older, they showed a greater probability of trusting others. Income also had a significant impact on social trust: if an individual had a higher income, this decreased the probability of low trust by 3.4%, but it increased the probability of high trust by 3.2%. An interesting finding from the analysis was that income did exhibit a non-linear relationship, as shown by the significance of the income-squared variable (although this was only significant at the 10% level), suggesting that the high earners may have low social trust. Being in employment was important for social trust: if an individual was employed, then this decreased the probability of low trust and increased the probability of high trust. Home ownership was particularly important for social trust: this significantly reduced the likelihood of low trust by about 1.5% and significantly increased the likelihood of high trust by 1.4%.

The findings on the ethnic diversity variable are particularly noteworthy: greater diversity contributes to a higher likelihood of low trust and a lower likelihood of high trust – this effect is strong and very significant at the 1% level. In terms of locational aspects, social trust is lower in urban areas than in rural areas. All the regional dummies were significant relative to the base category of West North Central. This suggests there are strong location effects independent of the effect of other variables. The length of residency in a community had no statistically significant impact on social trust. This is consistent with the argument that social trust, unlike many other indicators of social capital, does not require continual or regular local investment. Although the focus of the above discussion has been mainly on the low and high trust categories, note that most of the variables discussed were also significant, with the expected signs, for the medium-trust category. The authors prefer to speculate less about this category, relative to the low- and the high-trust categories, as the interpretation of the effects for the medium group are subject to greater ambiguity given that they include both those who are at the lower and higher ends of the spectrum with respect to social trust. Hence, for this and other indicators of social capital, this paper confines itself primarily to a discussion of the differences between the low and high categories and to the rest of the sample.

### *Racial trust*

The next set of results are those in which racial trust is the dependent variable. The question pertaining to this was as follows:

> Do you trust ethnic group X a lot, a little or not at all?[18]

As shown in Table 5, the findings show many similarities with the social trust results. As with social trust, education is important – a one-level increase in education reduces the probability of low racial trust by about

*Table* 4. *Ordered logit model for social trust*

| | Elasticities, standard errors and $p$ values for all categories | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|
| | Low | | | Medium | | | High | | |
| Variable | Elasticity | Standard error | $p>\|z\|$ | Elasticity | Standard error | $p>\|z\|$ | Elasticity | Standard error | $p>\|z\|$ |
| Education | −0.56781*** | 0.02067 | 0 | −0.03459*** | 0.00450 | 0 | 0.533224*** | 0.01925 | 0 |
| Residency | −0.03719 | 0.02314 | 0.108 | −0.00227 | 0.00144 | 0.116 | 0.034923 | 0.02173 | 0.108 |
| Age | −0.86993*** | 0.13250 | 0 | −0.05299*** | 0.01032 | 0 | 0.816936*** | 0.12452 | 0 |
| Agesq | 0.013094 | 0.06754 | 0.846 | 0.000798 | 0.00411 | 0.846 | −0.0123 | 0.06342 | 0.846 |
| Income | −0.33966*** | 0.04654 | 0 | −0.02069*** | 0.00378 | 0 | 0.318969*** | 0.04375 | 0 |
| Incsq | 0.062641* | 0.03237 | 0.053 | 0.003816* | 0.00202 | 0.059 | −0.05883* | 0.03040 | 0.053 |
| Employed | −0.10361*** | 0.02233 | 0 | −0.00631*** | 0.00155 | 0 | 0.097299*** | 0.02099 | 0 |
| Home ownership | −0.14615*** | 0.01468 | 0 | −0.0089*** | 0.00141 | 0 | 0.137247*** | 0.01380 | 0 |
| Ethnic diversity | 0.497912*** | 0.02851 | 0 | 0.030331*** | 0.00415 | 0 | −0.46758*** | 0.02673 | 0 |
| Urban–rural | −0.14809*** | 0.01423 | 0 | −0.00902*** | 0.00141 | 0 | 0.139068*** | 0.01337 | 0 |
| New England | 0.020746*** | 0.00304 | 0 | 0.001264*** | 0.00024 | 0 | −0.01948*** | 0.00285 | 0 |
| Mid Atlantic | 0.031382*** | 0.00351 | 0 | 0.001912*** | 0.00032 | 0 | −0.02947*** | 0.00329 | 0 |
| East North Central | 0.064894*** | 0.00776 | 0 | 0.003953*** | 0.00068 | 0 | −0.06094*** | 0.00729 | 0 |
| South Atlantic | 0.069656*** | 0.00750 | 0 | 0.004243*** | 0.00069 | 0 | −0.06541*** | 0.00705 | 0 |
| East South Central | 0.017431*** | 0.00230 | 0 | 0.001062*** | 0.00019 | 0 | −0.01637*** | 0.00216 | 0 |
| West South Central | 0.017053*** | 0.00251 | 0 | 0.001039*** | 0.00020 | 0 | −0.01601*** | 0.00236 | 0 |
| Mountain | 0.009452*** | 0.00331 | 0.004 | 0.000576 | 0.00021 | 0.007 | −0.00888*** | 0.00311 | 0.004 |
| Pacific | 0.015764** | 0.00692 | 0.023 | 0.00096** | 0.00044 | 0.028 | −0.0148** | 0.00650 | 0.023 |
| Number of observations = 24 384 | | | | | | | | | |
| Log pseudo-likelihood = −24 511.089 | | | | | | | | | |

*Note:* Significant at *10, **5 and ***1% levels.

*Table* 5. *Ordered logit model for racial trust*

| | Elasticities, standard errors and $p$ values for all categories | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|
| | Low | | | Medium | | | High | | |
| Variable | Elasticity | Standard error | $p>\|z\|$ | Elasticity | Standard error | $p>\|z\|$ | Elasticity | Standard error | $p>\|z\|$ |
| Education | −0.48516*** | 0.02541 | 0 | −0.06116*** | 0.00400 | 0 | 0.423999*** | 0.02247 | 0 |
| Residency | −0.07883*** | 0.03022 | 0.009 | −0.00994*** | 0.00383 | 0.01 | 0.06889*** | 0.02641 | 0.009 |
| Age | 0.329426* | 0.18202 | 0.07 | 0.041527* | 0.02310 | 0.072 | −0.2879* | 0.15899 | 0.07 |
| Agesq | −0.49412*** | 0.09342 | 0 | −0.06229*** | 0.01223 | 0 | 0.431829*** | 0.08150 | 0 |
| Income | −0.33837*** | 0.06298 | 0 | −0.04266*** | 0.00806 | 0 | 0.295717*** | 0.05515 | 0 |
| Incsq | 0.074655* | 0.04201 | 0.076 | 0.009411* | 0.00529 | 0.075 | −0.06524* | 0.03673 | 0.076 |
| Employed | −0.0494* | 0.02998 | 0.099 | −0.00623* | 0.00378 | 0.099 | 0.043173* | 0.02621 | 0.1 |
| Home ownership | −0.08125*** | 0.01951 | 0 | −0.01024*** | 0.00248 | 0 | 0.071006*** | 0.01707 | 0 |
| Ethnic diversity | 0.432516*** | 0.03675 | 0 | 0.054523*** | 0.00520 | 0 | −0.37799*** | 0.03215 | 0 |
| Urban–rural | −0.14384*** | 0.01808 | 0 | −0.01813*** | 0.00240 | 0 | 0.12571*** | 0.01582 | 0 |
| New England | 0.001263 | 0.00383 | 0.742 | 0.000159 | 0.00048 | 0.742 | −0.0011 | 0.00335 | 0.742 |
| Mid Atlantic | 0.023844*** | 0.00449 | 0 | 0.003006*** | 0.00058 | 0 | −0.02084*** | 0.00392 | 0 |
| East North Central | 0.048512*** | 0.01008 | 0 | 0.006115*** | 0.00130 | 0 | −0.0424*** | 0.00881 | 0 |
| South Atlantic | 0.050797*** | 0.00973 | 0 | 0.006404*** | 0.00125 | 0 | −0.04439*** | 0.00851 | 0 |
| East South Central | 0.015796*** | 0.00294 | 0 | 0.001991*** | 0.00038 | 0 | −0.01381*** | 0.00257 | 0 |
| West South Central | 0.013187*** | 0.00319 | 0 | 0.001662*** | 0.00041 | 0 | −0.01152*** | 0.00279 | 0 |
| Mountain | 0.002447 | 0.00426 | 0.566 | 0.000309 | 0.00054 | 0.566 | −0.00214 | 0.00372 | 0.566 |
| Pacific | 0.01716** | 0.00877 | 0.05 | 0.002163* | 0.00111 | 0.051 | −0.015** | 0.00767 | 0.05 |
| Number of observations = 20 792 | | | | | | | | | |
| Log pseudo-likelihood = −20 032.836 | | | | | | | | | |

*Note:* Significant at *10, **5 and ***1% levels.

4.9%, and it also increases the probability of high racial trust by 4.2% (this effect is significant at the 1% level). Residency or how long the individual has lived in the community matters for racial trust: the results show that being a resident for longer reduces the probability of low trust and raises the likelihood of high racial trust. The age-squared variable is positive, and the income-squared variable is negative and statistically significant

for the category of high racial trust. This suggests that racial trust is higher amongst the very old, but lower amongst the very rich. Whilst a higher level of racial tolerance amongst the elderly may be explainable by the evidence that suggests that social capital has gone down over time in the USA, it is more difficult to explain the apparent intolerance of the very rich. Employment reduces the probability of low trust and raises the likelihood of high trust; and so also does home ownership. The regional dummies are all significant, and positive for the low-trust category, but the size of the elasticities are frequently very low, with a maximum of 0.1% for the low-trust category in West South Central. Ethnic diversity is important, but higher diversity leads to a 3.8% lower probability of racial trust for the high-trust category. Racial trust is also lower in the urban areas relative to rural areas.

### *Civic participation*

The survey investigated civic participation by asking the following question:

> Did you vote in the previous election? Have you participated in signing a petition, attended a political meeting or rally, worked on community project, signed a petition, participated in boycotts, demonstrations, protests or marches?

As shown in Table 6, the influence of civic participation is then divided into four categories in the survey: very low, low, medium and high. More education is associated with a greater probability of civic participation: a one-level increase in education decreases the probability of very low participation by 9.8% and increases the likelihood of very high participation by 8.7%. Living in the community longer also increases the likelihood of high participation by about 3.0%, and reduces the probability of very low and low participation by about 3.4 and 1.5%, respectively. This suggests that activities such as these, which involve some amount of continual investment of resources and time, are dependent on long-term residence in an area. Participation increases with age, but as expected, the very old do not participate as much. Employment increases the probability of high participation by about 1.4%, and so does home ownership. Greater ethnic diversity reduces the likelihood of civic participation by about 1.8% for the high-participation category and increases the likelihood of very low participation by about 2%. The regional effects are also significant for all regions with the exception of New England and the Pacific regions.

*Table 6. Ordered logit model for civic participation*

| | Elasticities, standard errors and $p$ values for all categories | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | Very low | | | Low | | | Medium | | | High | | |
| Variable | Elasticity | Standard error | $p>\|z\|$ | Elasticity | Standard error | $p>\|z\|$ | Elasticity | Standard error | $p>\|z\|$ | Elasticity | Standard error | $p>\|z\|$ |
| Education | −0.98295*** | 0.02491 | 0 | −0.44793*** | 0.0129 | 0 | 0.264002*** | 0.00919 | 0 | 0.87348*** | 0.02224 | 0 |
| Residency | −0.33672*** | 0.02749 | 0 | −0.15344*** | 0.01267 | 0 | 0.090436*** | 0.00773 | 0 | 0.299218*** | 0.02445 | 0 |
| Age | −2.40836*** | 0.15916 | 0 | −1.09749*** | 0.07358 | 0 | 0.646838*** | 0.04619 | 0 | 2.140133*** | 0.14191 | 0 |
| Agesq | 0.996607*** | 0.07785 | 0 | 0.454153*** | 0.03594 | 0 | −0.26767*** | 0.02201 | 0 | −0.88561*** | 0.06925 | 0 |
| Income | −0.47518*** | 0.05451 | 0 | −0.21654*** | 0.02492 | 0 | 0.127625*** | 0.01509 | 0 | 0.42226*** | 0.0485 | 0 |
| Incsq | 0.094028** | 0.03783 | 0.013 | 0.042848** | 0.01724 | 0.013 | −0.02525** | 0.0102 | 0.013 | −0.08356** | 0.03362 | 0.013 |
| Employed | −0.15829*** | 0.02622 | 0 | −0.07213*** | 0.01197 | 0 | 0.042515*** | 0.00714 | 0 | 0.140664*** | 0.02331 | 0 |
| Home ownership | −0.15183*** | 0.01794 | 0 | −0.06919*** | 0.00819 | 0 | 0.04078*** | 0.00497 | 0 | 0.134924*** | 0.01598 | 0 |
| Ethnic diversity | 0.205069*** | 0.03334 | 0 | 0.09345*** | 0.01522 | 0 | −0.05508*** | 0.00908 | 0 | −0.18223*** | 0.02964 | 0 |
| Urban–rural | 0.054886*** | 0.01628 | 0.001 | 0.025011*** | 0.00743 | 0.001 | −0.01474*** | 0.00438 | 0.001 | −0.04877*** | 0.01447 | 0.001 |
| New England | −0.00084 | 0.00352 | 0.813 | −0.00038 | 0.0016 | 0.813 | 0.000224 | 0.00095 | 0.812 | 0.000742 | 0.00313 | 0.812 |
| Mid Atlantic | 0.024138*** | 0.00403 | 0 | 0.011*** | 0.00184 | 0 | −0.00648*** | 0.00109 | 0 | −0.02145*** | 0.00358 | 0 |
| East North Central | 0.030104*** | 0.00879 | 0.001 | 0.013718*** | 0.00401 | 0.001 | −0.00809*** | 0.00237 | 0.001 | −0.02675*** | 0.00781 | 0.001 |
| South Atlantic | 0.036527*** | 0.00855 | 0 | 0.016645*** | 0.0039 | 0 | −0.00981*** | 0.00231 | 0 | −0.03246*** | 0.0076 | 0 |
| East South Central | 0.006777*** | 0.00264 | 0.01 | 0.003088*** | 0.0012 | 0.01 | −0.00182*** | 0.00071 | 0.01 | −0.00602*** | 0.00234 | 0.01 |
| West South Central | 0.016829*** | 0.00288 | 0 | 0.007669*** | 0.00132 | 0 | −0.00452*** | 0.00078 | 0 | −0.01495*** | 0.00256 | 0 |
| Mountain | −0.00792** | 0.00391 | 0.043 | −0.00361** | 0.00178 | 0.043 | 0.002128** | 0.00105 | 0.043 | 0.007039** | 0.00348 | 0.043 |
| Pacific | 0.010708 | 0.00809 | 0.186 | 0.00488 | 0.00369 | 0.186 | −0.00288 | 0.00218 | 0.186 | −0.00952 | 0.00719 | 0.186 |
| Number of observations = 24 461 | | | | | | | | | | | | |
| Log pseudo-likelihood = −30 887.904 | | | | | | | | | | | | |

*Note:* Significant at **5 and ***1% levels.

*Table 7. Ordered logit model for diversity of friendship networks*

| | Elasticities, standard errors and $p$ values for all categories | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | Very low | | | Low | | | Medium | | | High | | |
| Variable | Elasticity | Standard error | $p>\|z\|$ | Elasticity | Standard error | $p>\|z\|$ | Elasticity | Standard error | $p>\|z\|$ | Elasticity | Standard error | $p>\|z\|$ |
| Education | −0.40387*** | 0.02045 | 0 | −0.13649*** | 0.00757 | 0 | 0.150513*** | 0.00807 | 0 | 0.415455*** | 0.02097 | 0 |
| Residency | −0.12051*** | 0.02374 | 0 | −0.04073*** | 0.00806 | 0 | 0.044911*** | 0.00891 | 0 | 0.123965*** | 0.02444 | 0 |
| Age | −1.40511*** | 0.1343 | 0 | −0.47485*** | 0.04671 | 0 | 0.523652*** | 0.05077 | 0 | 1.44541*** | 0.13793 | 0 |
| Agesq | 0.808851*** | 0.06778 | 0 | 0.273347*** | 0.02376 | 0 | −0.30144*** | 0.02575 | 0 | −0.83205*** | 0.06959 | 0 |
| Income | −0.33988*** | 0.04765 | 0 | −0.11486*** | 0.01625 | 0 | 0.126664*** | 0.01798 | 0 | 0.349624*** | 0.04904 | 0 |
| Incsq | 0.029132 | 0.03258 | 0.371 | 0.009845 | 0.01101 | 0.371 | −0.01086 | 0.01214 | 0.371 | −0.02997 | 0.03351 | 0.371 |
| Employed | −0.14041*** | 0.02242 | 0 | −0.04745*** | 0.00764 | 0 | 0.052328*** | 0.00841 | 0 | 0.144438*** | 0.02306 | 0 |
| Home ownership | 0.000308 | 0.01539 | 0.984 | 0.000104 | 0.0052 | 0.984 | −0.00011 | 0.00573 | 0.984 | −0.00032 | 0.01583 | 0.984 |
| Ethnic diversity | −0.02549 | 0.02874 | 0.375 | −0.00861 | 0.00972 | 0.376 | 0.009499 | 0.01071 | 0.375 | 0.026218 | 0.02956 | 0.375 |
| Urban–rural | 0.038143*** | 0.01409 | 0.007 | 0.01289*** | 0.00477 | 0.007 | −0.01422*** | 0.00526 | 0.007 | −0.03924*** | 0.0145 | 0.007 |
| New England | −0.00386 | 0.00296 | 0.192 | −0.00131 | 0.001 | 0.193 | 0.00144 | 0.00111 | 0.193 | 0.003975 | 0.00305 | 0.192 |
| Mid Atlantic | −0.0009 | 0.00353 | 0.8 | −0.0003 | 0.00119 | 0.8 | 0.000334 | 0.00132 | 0.8 | 0.000921 | 0.00363 | 0.8 |
| East North Central | 0.003879 | 0.00767 | 0.613 | 0.001311 | 0.00259 | 0.613 | −0.00145 | 0.00286 | 0.613 | −0.00399 | 0.00789 | 0.613 |
| South Atlantic | −0.00425 | 0.00747 | 0.57 | −0.00144 | 0.00253 | 0.57 | 0.001583 | 0.00279 | 0.57 | 0.00437 | 0.00769 | 0.57 |
| East South Central | 0.003693 | 0.00227 | 0.103 | 0.001248 | 0.00077 | 0.103 | −0.00138 | 0.00084 | 0.103 | −0.0038 | 0.00233 | 0.103 |
| West South Central | 0.002652 | 0.00248 | 0.285 | 0.000896 | 0.00084 | 0.285 | −0.00099 | 0.00092 | 0.285 | −0.00273 | 0.00255 | 0.285 |
| Mountain | −0.01608*** | 0.00333 | 0 | −0.00543*** | 0.00113 | 0 | 0.005992*** | 0.00125 | 0 | 0.01654*** | 0.00343 | 0 |
| Pacific | −0.01721** | 0.00706 | 0.015 | −0.00582** | 0.00239 | 0.015 | 0.006413** | 0.00263 | 0.015 | 0.017702** | 0.00726 | 0.015 |
| Number of observations = 24 461 | | | | | | | | | | | | |
| Log pseudo-likelihood = −32 847.379 | | | | | | | | | | | | |

*Note:* Significant at **5 and ***1% levels.

*Diversity of friendship networks*

This variable was based on the following:

> Which of the following types of people do you have as a personal friend: owns a business, is a manual worker, on welfare, owns a vacation home, has a different religious orientation, is white, is Latino or Hispanic, is Asian, is black or African-American, is gay or lesbian, is a community leader?

As shown in Table 7, the responses were grouped into four categories: very low, low, medium and high. Education increased the probability of high diversity in an individual's network of friends, with an effect of 4.2%. Employment also increased the diversity of friendships in which individuals engaged. Those who enjoyed a higher income also enjoyed the benefit of a wide variety of friendship networks, and as expected, this effect was not significantly different for the young relative to the elderly. If an individual lived in the community for longer, this contributed to a higher probability of diverse friendship networks. The diversity of friendship networks is also greater in urban than in rural areas, as might be expected, as urban areas typically benefit from the effects of both national and international migration. Interestingly, the regional dummies were all insignificant with the exception of the Mountain and the Pacific regions, which showed greater diversity of friendship networks. At least for the Pacific, this probably represents the multiethnic composition of the population.

*Group involvement*

The survey tested group involvement (not including church activity) by asking the following question:

> Which of the following groups are you a member of: sports club, youth group, parent association, veterans group, neighbourhood association, seniors group, charity, labour union, participate in business as a group, ethnic organization, political, art, hobby, self-help, internet and other?

As shown in Table 8, the responses to this question were categorized as very low, low, medium and high. Many of the variables that were important indicators of other measures of social capital were also important for group involvement. For example, a one-level increase in education increased the likelihood of high group involvement by 7.8% and decreased the likelihood of low involvement by 8.8%. Employment increased the likelihood of high involvement by about 10%, as did income, although the effect was lower at 3.2%. Living for an extended period in the community significantly increased the probability of group involvement, again suggesting that this required time and resources that were more likely to be provided with longer residence.

*Table 8. Ordered logit model for group involvement*

| | Elasticities, standard errors and $p$ values for all categories | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | Very low | | | Low | | | Medium | | | High | | |
| Variable | Elasticity | Standard error | $p>\|z\|$ | Elasticity | Standard error | $p>\|z\|$ | Elasticity | Standard error | $p>\|z\|$ | Elasticity | Standard error | $p>\|z\|$ |
| Education | −0.87809*** | 0.0235 | 0 | −0.3823*** | 0.01152 | 0 | 0.230917*** | 0.00854 | 0 | 0.775758*** | 0.02095 | 0 |
| Residency | −0.22375*** | 0.0266 | 0 | −0.09741*** | 0.01166 | 0 | 0.05884*** | 0.00715 | 0 | 0.19767*** | 0.0235 | 0 |
| Age | −0.71533*** | 0.15613 | 0 | −0.31143*** | 0.0681 | 0 | 0.188114*** | 0.04138 | 0 | 0.631963*** | 0.13798 | 0 |
| Agesq | 0.24011*** | 0.07913 | 0.002 | 0.104537*** | 0.03447 | 0.002 | −0.06314*** | 0.02089 | 0.003 | −0.21213*** | 0.06992 | 0.002 |
| Income | −0.36485*** | 0.05382 | 0 | −0.15885*** | 0.02347 | 0 | 0.095947*** | 0.01448 | 0 | 0.322332*** | 0.04761 | 0 |
| Incsq | −0.01181 | 0.0369 | 0.749 | −0.00514 | 0.01607 | 0.749 | 0.003106 | 0.0097 | 0.749 | 0.010435 | 0.0326 | 0.749 |
| Employed | −0.11581*** | 0.02519 | 0 | −0.05042*** | 0.01099 | 0 | 0.030454*** | 0.00667 | 0 | 0.10231*** | 0.02226 | 0 |
| Home ownership | −0.09728*** | 0.01719 | 0 | −0.04235*** | 0.0075 | 0 | 0.025581*** | 0.00458 | 0 | 0.085939*** | 0.0152 | 0 |
| Ethnic diversity | 0.060148* | 0.03227 | 0.062 | 0.026187* | 0.01405 | 0.062 | −0.01582 | 0.0085 | 0.063 | −0.05314 | 0.02851 | 0.062 |
| Urban–rural | 0.016301 | 0.01617 | 0.313 | 0.007097 | 0.00704 | 0.313 | −0.00429 | 0.00425 | 0.314 | −0.0144 | 0.01429 | 0.313 |
| New England | 0.010802*** | 0.00338 | 0.001 | 0.004703*** | 0.00147 | 0.001 | −0.00284*** | 0.00089 | 0.001 | −0.00954*** | 0.00299 | 0.001 |
| Mid Atlantic | 0.015073*** | 0.00397 | 0 | 0.006562*** | 0.00173 | 0 | −0.00396*** | 0.00105 | 0 | −0.01332*** | 0.00351 | 0 |
| East North Central | 0.004738 | 0.00875 | 0.588 | 0.002063 | 0.00381 | 0.588 | −0.00125 | 0.0023 | 0.588 | −0.00419 | 0.00773 | 0.588 |
| South Atlantic | −0.00293 | 0.00851 | 0.73 | −0.00128 | 0.00371 | 0.73 | 0.000771 | 0.00224 | 0.73 | 0.002591 | 0.00752 | 0.73 |
| East South Central | 0.001345 | 0.00262 | 0.607 | 0.000586 | 0.00114 | 0.607 | −0.00035 | 0.00069 | 0.607 | −0.00119 | 0.00231 | 0.607 |
| West South Central | −0.0005 | 0.00283 | 0.86 | −0.00022 | 0.00123 | 0.86 | 0.000131 | 0.00074 | 0.86 | 0.000439 | 0.0025 | 0.86 |
| Mountain | 0.001551 | 0.00381 | 0.684 | 0.000675 | 0.00166 | 0.684 | −0.00041 | 0.001 | 0.684 | −0.00137 | 0.00337 | 0.684 |
| Pacific | 0.016249** | 0.0079 | 0.04 | 0.007074** | 0.00344 | 0.04 | −0.00427** | 0.00208 | 0.04 | −0.01436** | 0.00698 | 0.04 |
| Number of observations = 24 461 | | | | | | | | | | | | |
| Log pseudo-likelihood = −31 582.431 | | | | | | | | | | | | |

*Note:* Significant at *10, **5 and ***1% levels.

The very old were also less likely to be involved with group activity, but this is to be expected. A higher level of ethnic diversity significantly reduced the probability of high group involvement. As far as the regional differences are concerned, these were only significant for New England, the Mid-Atlantic and the Pacific regions, where there was a lower likelihood of group involvement compared with West North Central.

### *Faith-based social capital*

To assess the influence of faith-based capital, the survey asked the following questions:

> Are you a member of a church? Do you attend church service? Do you participate in non-religious church service? Are you affiliated with non-religious church service groups?

Based on responses to these questions, and as shown in Table 9, the survey graded the responses into three categories: low, medium and high. Education and a higher income increase the probability of high faith-based social capital by about 2.1 and 2.2%, respectively. Interestingly, employment reduces the likelihood of having high faith-based social capital by about 1.3%. And the very rich have a lower probability of high faith-based social capital. Perhaps they might consider themselves too busy to go to church? This suggests that the drivers of faith-based social capital are somewhat different to other indicators of social capital. Living in the community raises the likelihood of high faith-based social capital by about 2.4%. Older people also exhibit a greater likelihood of high faith-based social capital. Home ownership increases the probability of having high faith-based social capital by about 1.6%. Interestingly, ethnic diversity is not a significant predictor of faith-based social capital. Residence in an urban area significantly raises the likelihood of high faith-based social capital. The regional dummies are significant and display varied effects: in the South Atlantic, East South Central and West South Central they positively increase the likelihood of high faith-based social capital. For the other regions, relative to West Central North, they decrease the likelihood of high faith-based social capital.

### *Organized interactions*

The influence of organized interactions was measured by a series of questions such as follows:

> Have you attended public meetings? Have you attended club meetings? Have you attended local community events?

As shown in Table 10, the responses were grouped into three categories: low, medium and high. Again, there

*Table 9. Ordered logit model for faith-based social capital*

| | Elasticities, standard errors and $p$ values for all categories | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|
| | Low | | | Medium | | | High | | |
| Variable | Elasticity | Standard error | $p>\|z\|$ | Elasticity | Standard error | $p>\|z\|$ | Elasticity | Standard error | $p>\|z\|$ |
| Education | −0.19273*** | 0.01799 | 0 | 0.015784*** | 0.0021 | 0 | 0.208511*** | 0.01938 | 0 |
| Residency | −0.22471*** | 0.02064 | 0 | 0.018403*** | 0.00256 | 0 | 0.243111*** | 0.02242 | 0 |
| Age | −0.1941* | 0.11559 | 0.093 | 0.015897* | 0.00958 | 0.097 | 0.209999* | 0.12503 | 0.093 |
| Agesq | −0.0802 | 0.05795 | 0.166 | 0.006569 | 0.0048 | 0.171 | 0.086773 | 0.06271 | 0.166 |
| Income | −0.20699*** | 0.04118 | 0 | 0.016952*** | 0.00376 | 0 | 0.223943*** | 0.04454 | 0 |
| Incsq | 0.119824*** | 0.02867 | 0 | −0.00981*** | 0.00253 | 0 | −0.12964*** | 0.031 | 0 |
| Employed | 0.120496*** | 0.0199 | 0 | −0.00987*** | 0.00189 | 0 | −0.13036*** | 0.02151 | 0 |
| Home ownership | −0.15016*** | 0.01339 | 0 | 0.012298*** | 0.00165 | 0 | 0.162461*** | 0.01448 | 0 |
| Ethnic diversity | −0.04105 | 0.02521 | 0.104 | 0.003362 | 0.0021 | 0.109 | 0.044413 | 0.02729 | 0.104 |
| Urban–rural | −0.03295*** | 0.01261 | 0.009 | 0.002699** | 0.00107 | 0.011 | 0.035648*** | 0.01364 | 0.009 |
| New England | 0.025736*** | 0.0026 | 0 | −0.00211*** | 0.0003 | 0 | −0.02784*** | 0.00282 | 0 |
| Mid Atlantic | 0.011671*** | 0.00299 | 0 | −0.00096*** | 0.00026 | 0 | −0.01263*** | 0.00323 | 0 |
| East North Central | 0.017062** | 0.00671 | 0.011 | −0.0014** | 0.00057 | 0.014 | −0.01846** | 0.00727 | 0.011 |
| South Atlantic | −0.01951*** | 0.00658 | 0.003 | 0.001598*** | 0.00056 | 0.004 | 0.021111*** | 0.00711 | 0.003 |
| East South Central | −0.00898*** | 0.00196 | 0 | 0.000735*** | 0.00018 | 0 | 0.009713*** | 0.00212 | 0 |
| West South Central | −0.00802*** | 0.00211 | 0 | 0.000657*** | 0.00019 | 0 | 0.00868*** | 0.00229 | 0 |
| Mountain | 0.02858*** | 0.00301 | 0 | −0.00234*** | 0.00035 | 0 | −0.03092*** | 0.00327 | 0 |
| Pacific | 0.072997*** | 0.00629 | 0 | −0.00598*** | 0.00081 | 0 | −0.07898*** | 0.00684 | 0 |
| Number of observations = 24 350 | | | | | | | | | |
| Log pseudo-likelihood = −25 735.454 | | | | | | | | | |

*Note:* Significant at *10, **5 and ***1% levels.

*Table 10. Ordered logit model for organized interactions*

| | Elasticities, standard errors and $p$ values for all categories | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|
| | Low | | | Medium | | | High | | |
| Variable | Elasticity | Standard error | $p>\|z\|$ | Elasticity | Standard error | $p>\|z\|$ | Elasticity | Standard error | $p>\|z\|$ |
| Education | −0.61784*** | 0.02039 | 0 | −0.05526*** | 0.00479 | 0 | 0.562574*** | 0.01858 | 0 |
| Residency | −0.27865*** | 0.02389 | 0 | −0.02492*** | 0.00295 | 0 | 0.253723*** | 0.02171 | 0 |
| Age | 0.330353** | 0.13833 | 0.017 | 0.029549*** | 0.01269 | 0.02 | −0.3008** | 0.12587 | 0.017 |
| Agesq | 0.040396 | 0.07027 | 0.565 | 0.003613 | 0.00628 | 0.565 | −0.03678 | 0.064 | 0.565 |
| Income | −0.4368*** | 0.04703 | 0 | −0.03907*** | 0.00517 | 0 | 0.39773*** | 0.04292 | 0 |
| Incsq | 0.073944 | 0.0325 | 0.023 | 0.006614** | 0.00294 | 0.025 | −0.06733** | 0.02961 | 0.023 |
| Employed | −0.12798*** | 0.02238 | 0 | −0.01145*** | 0.00219 | 0 | 0.116536*** | 0.02039 | 0 |
| Home ownership | −0.06333*** | 0.01515 | 0 | −0.00566*** | 0.00142 | 0 | 0.057661*** | 0.0138 | 0 |
| Ethnic diversity | 0.193149*** | 0.02804 | 0 | 0.017277*** | 0.00287 | 0 | −0.17587*** | 0.02553 | 0 |
| Urban–rural | −0.05809*** | 0.01441 | 0 | −0.0052*** | 0.00136 | 0 | 0.052893*** | 0.01312 | 0 |
| New England | 0.01268*** | 0.00302 | 0 | 0.001134*** | 0.00029 | 0 | −0.01155*** | 0.00275 | 0 |
| Mid Atlantic | 0.019482*** | 0.00357 | 0 | 0.001743*** | 0.00035 | 0 | −0.01774*** | 0.00325 | 0 |
| East North Central | 0.025174*** | 0.00783 | 0.001 | 0.002252*** | 0.00072 | 0.002 | −0.02292*** | 0.00713 | 0.001 |
| South Atlantic | 0.026959*** | 0.00751 | 0 | 0.002411*** | 0.0007 | 0.001 | −0.02455*** | 0.00684 | 0 |
| East South Central | 0.00786*** | 0.00235 | 0.001 | 0.000703*** | 0.00022 | 0.001 | −0.00716*** | 0.00214 | 0.001 |
| West South Central | 0.001666 | 0.00245 | 0.497 | 0.000149 | 0.00022 | 0.498 | −0.00152 | 0.00223 | 0.497 |
| Mountain | 0.000179 | 0.00332 | 0.957 | 0.000016 | 0.0003 | 0.957 | −0.00016 | 0.00302 | 0.957 |
| Pacific | 0.024017*** | 0.00692 | 0.001 | 0.002148*** | 0.00064 | 0.001 | −0.02187*** | 0.0063 | 0.001 |
| Number of observations = 24 457 | | | | | | | | | |
| Log pseudo-likelihood = −25 226.948 | | | | | | | | | |

*Note:* Significant at **5 and ***1% levels.

were very similar determinants of the probability of high levels of organized interactions. Education, income and employment all exerted positive effects on this with effects of 5.6, 4.0 and 1.2%, respectively. The very rich had a lower probability of high interactions – this may reflect that that their work commitments conflict with such forms of engagement or it may reflect something about their character. Home ownership significantly increased the likelihood of a high level of organized interactions. As expected, living in the community was

very important and exerted a strong positive effect on the likelihood of interactions by about 2.5%. Greater ethnic diversity decreased high participation in organized interactions by about 1.8%. These interactions were also less likely in urban areas, relative to rural areas, which again suggests that people in rural communities have resources and time to invest in these interactions. As far as the regional dummies are concerned, these are positive and significant for all regions except West South Central and the Mountain region.

*Informal social interactions*

In addition to formal organized interactions, the survey also examined informal social interactions by asking a series of questions including the following:

> How often do you play cards or board games with others? How often do you have friends over to your house? How often do you socialise with friends in a public place? How often do you socialise with co-workers outside of work? How often do you visit relatives?

As shown in Table 11, education and income both increased the likelihood of informal social interactions, but employment did not have an impact on this variable. The income-squared variable was also negative and significant for those with high levels of informal social interactions, showing that the very rich did not engage in these activities as much as others. The very old, however, did engage in these interactions, and the effects for them were very strong. Living in the community for a longer period significantly raised the probability of informal social interactions, as might be expected as these typically need time and resources in order to be fostered and developed. Interestingly, home ownership significantly reduced the likelihood of high interactions, which is an unexpected result. Higher ethnic diversity significantly reduced the likelihood of high levels of these informal interactions. Finally, in contrast to all other indicators of social capital considered in this study, none of the regional dummy variables was significant.

*Summary discussion*

The multivariate analyses of the data indicate that a number of empirical regularities are seen across the range of social capital indicators. First, education seems consistently to be important and correlated with higher social capital. Income behaves likewise, but there is one important caveat – it bears a non-linear relationship with social capital as the very rich seem to have either less inclination to participate in, or less time to devote to, some kinds of activities such as investing in faith-based social capital, organized interactions and informal social interactions. As expected, employment also builds networks, and in general increases both social and racial trust. If an individual owns their home or lives for long periods in a community, then this again raises their social capital. This probably reflects the increased incentives to invest the time and resources to join or form networks and to engage in civic interactions. The effect of age was important in that older people had more social

*Table* 11. *Ordered logit model for informal social interactions*

| | Elasticities, standard errors and $p$ values for all categories | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|
| | Low | | | Medium | | | High | | |
| Variable | Elasticity | Standard error | $p>\|z\|$ | Elasticity | Standard error | $p>\|z\|$ | Elasticity | Standard error | $p>\|z\|$ |
| Education | −0.08629*** | 0.01888 | 0 | −0.00566*** | 0.00136 | 0 | 0.08063*** | 0.01768 | 0 |
| Residency | −0.28113*** | 0.0232 | 0 | −0.01843*** | 0.00258 | 0 | 0.262691*** | 0.02171 | 0 |
| Age | 3.495067*** | 0.13986 | 0 | 0.22919*** | 0.02811 | 0 | −3.26588*** | 0.12943 | 0 |
| Agesq | −1.35506*** | 0.07057 | 0 | −0.08886*** | 0.01135 | 0 | 1.266201*** | 0.06543 | 0 |
| Income | −0.27736*** | 0.04575 | 0 | −0.01819*** | 0.00361 | 0 | 0.259171*** | 0.04279 | 0 |
| Incsq | 0.08475*** | 0.03072 | 0.006 | 0.005558*** | 0.00211 | 0.008 | −0.07919*** | 0.02871 | 0.006 |
| Employed | −0.00594 | 0.0227 | 0.793 | −0.00039 | 0.00149 | 0.793 | 0.005552 | 0.02121 | 0.794 |
| Home ownership | 0.05351*** | 0.01487 | 0 | 0.003509*** | 0.00106 | 0.001 | −0.05*** | 0.01389 | 0 |
| Ethnic diversity | 0.257632*** | 0.02766 | 0 | 0.016894*** | 0.00263 | 0 | −0.24074*** | 0.02588 | 0 |
| Urban–rural | −0.03524** | 0.01379 | 0.011 | −0.00231** | 0.00094 | 0.014 | 0.03293** | 0.01289 | 0.011 |
| New England | 0.001688 | 0.00295 | 0.568 | 0.000111 | 0.00019 | 0.568 | −0.00158 | 0.00276 | 0.568 |
| Mid Atlantic | 0.003242 | 0.00343 | 0.344 | 0.000213 | 0.00023 | 0.347 | −0.00303 | 0.0032 | 0.344 |
| East North Central | −0.01013 | 0.00756 | 0.18 | −0.00066 | 0.0005 | 0.185 | 0.009468 | 0.00706 | 0.18 |
| South Atlantic | 0.011686 | 0.00731 | 0.11 | 0.000766 | 0.00049 | 0.116 | −0.01092 | 0.00683 | 0.11 |
| East South Central | −0.00036 | 0.00224 | 0.873 | −2.4E–05 | 0.00015 | 0.873 | 0.000336 | 0.0021 | 0.873 |
| West South Central | −0.00068 | 0.00242 | 0.78 | −4.4E–05 | 0.00016 | 0.78 | 0.000631 | 0.00226 | 0.78 |
| Mountain | −0.00148 | 0.0032 | 0.644 | −9.7E–05 | 0.00021 | 0.644 | 0.001383 | 0.00299 | 0.644 |
| Pacific | 0.004854 | 0.00679 | 0.475 | 0.000318 | 0.00045 | 0.477 | −0.00454 | 0.00635 | 0.475 |
| Number of observations = 24 456 | | | | | | | | | |
| Log pseudo-likelihood = −25 846.051 | | | | | | | | | |

*Note:* Significant at *10, **5 and ***1% levels.

capital on average than their younger counterparts, but equally the impact of this effect was non-linear in that for the very old they were less able to engage in formal organized interactions, preferring instead greater emphasis on informal social interactions and faith-based social capital. Of all the socio-economic determinants investigated, the impact of ethnic diversity is noteworthy for the significant negative effect it appears to exert on indicators of social capital. The one area in which this diversity did not have a significant impact was for faith-based social capital and more research needs to be done on this issue. As far as spatial effects are concerned, urban areas seem to display less social capital than rural areas, although this variable was not always significant for all indicators of social capital. Finally, the findings show that even when account is taken of a wide range of independent variables, regional factors remain important for many social capital indicators. This provides a strong argument for the need to examine local areas in more detail to understand their importance for the formation and development of particular kinds of network interactions.

## CONCLUSIONS AND POLICY IMPLICATIONS

Social capital is important for economic growth and regional development. This study has evaluated economists' approach to investigating social capital, highlighting the many different definitions and approaches to studying the concept. Social capital within networks is important for economic phenomena and it is, therefore, important to examine network effects and network externalities with complementary research on neighbourhoods and ethnicity. But it is important to consider that social capital per se has limited value if it is not combined with other kinds of capital – social capital makes the other kinds of capital, such as human capital, more efficient. Furthermore, although social capital may have an important impact on growth, the mechanisms through which this may happen may be complex and vary across space and time. The latter indicates the importance of a spatial-, or a regional-, based approach to understanding the formation and impact of social capital.

A key aspect when considering the policy implications is that since social capital can only be acquired by a group and requires cooperation amongst members (in contrast to human capital, which is embodied in an individual), there is a strong case for government action. Governments can help by providing an enabling environment that encourages participation in local organizations. Stiglitz (1996), for example, argues that government policies can provide an enabling environment that encourages efficiency and information exchange. But producing 'good' social capital is not costless – it requires time and resources – and it must also take into account local characteristics.[19]

The analysis of the geography and formation of social capital in the USA illustrates that it is a complex phenomenon with significant spatial variation within one (albeit large) nation state. Drawing out the implications for public policy must therefore be undertaken with caution – but there are important patterns in the data that suggests there is scope for action in the USA.[20] First, investment in education may be very effective in raising the level of social capital. Second, being in work is an important source of social capital – and this effect is still important when account is taken of the income effect of having a job. This suggests that account should be taken of the wider benefits or externalities of the economic policies that generate jobs – and, of course, of the wider disadvantages of shocks or processes that destroy jobs. As recent growth in the USA has been considered as 'jobless' (Kitson, 2005b), this will not have helped the formation of social capital. Similarly, tackling poverty will reduce the number of people disconnected from wider networks and improve civic engagement. Third, the creation of social capital is linked to how long people live in a community. This suggests that geographical labour mobility may have harmful effects – and that this will be a particular challenge for those communities whose economies depend on a mobile work force. Fourth, initiatives that increase homeownership will enhance community social capital. Fifth, policy must address the association between ethnic diversity and low social capital. More research is needed on the dynamics of social capital formation in diverse communities, but at the very least governments must stop implementing policies that reduce trust between racial groups.[21] More research is also needed at the local level on the importance of institutions, both local and national, that may counter the negative impact of ethnic diversity (Alesina and La Ferrara, 2004). Furthermore, there may be a case that greater public investment is required to create more tolerant and understanding societies. What the empirical evidence should never justify is the case for ethnic homogenous communities – this will only lead to 'ghettoization' and further social and ethic fissure.

Social capital is a complex phenomenon with multiple possible outcomes and for some this complexity makes the concept chaotic (Fine, 2000). An alternative approach is to recognize that its very complexity and variety of potential impacts make it a vitally important phenomenon to understand. The importance of social capital has been recognized by many economists, who have used it to help try and explain variations in growth rates across countries.[21] But the complexity of social capital and the way it interacts with other forms of capital make it very difficult to disentangle its impact by comparing different countries. Even at the national level, this study has shown that although one can explain many of the determinants of social capital, further analysis is required of the significant spatial differences that remain. If the study of social capital is

to shed further light on growth, development and well-being, it needs not only to recognize fully the limitations of studies based on international comparisons, but also to maintain its spatial roots by continuing to analyse the experience of individual communities and regions.

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## NOTES

1. For a discussion of the links between bonding and bridging capital, see O'Brien *et al.* (2005).
2. The social capital literature makes important distinctions between 'particularized' trust (when the specific characteristics of individuals and groups are known) and 'generalized' trust (when personal characteristics and group affiliations are unknown) in individuals. It also makes a distinction between 'uniform' trust (when trust applies to all individuals) and 'differential' trust (when trust is accessible only to certain groups) in institutions. For more on these distinctions, see Ogilvie (2005).
3. Westlund and Nilsson (2005) consider the case of business enterprises benefiting by investing in social capital.
4. For example, in many developing countries, people can switch from using children as a form of old-age security provision to the use of pensions as these become increasingly available.
5. Because of such empirical problems, some have advocated the use of experimental results as preferable to survey data (Glaeser *et al.*, 2000; Durlauf, 2002).
6. Although Putnam's (1993) study of Italy indicated significant geographical variations in social capital within a country, it could be argued that his study of the USA (Putnam, 2000) suggest uniformity across the country. The authors thank the referee who pointed this out to them.
7. Rank correlations between the various social capital indicators are available upon request from the authors.
8. Of course, some of these regions are very large and would be similar in size to many nation states elsewhere.
9. The tables not reported here but are available upon request to the authors.
10. Whether any continual investment is required will depend on the type of trust (see note 2).
11. The tables are not reported here but are available upon request to the authors.
12. The table is not reported here but is available upon request to the authors.
13. All tables although not reported here are available upon request from the authors.
14. DiPasquale and Glaeser (1999) undertook various tests to examine whether it was not the factor of owning a home but some other characteristics of homeowners that cause them to invest in more social capital, but they found that the home ownership effect remained unaffected.
15. The categories are the city centre of a metropolitan status area (MSA) (an MSA is a geographic area consisting of a large population nucleus, as well as economically and socially related adjacent communities); in an MSA centre city county; a suburban county of an MSA; and not in an MSA.
16. It is this that often lies behind the curious paradox in countries such as India that one of the most serious political issues in the country involves religious issues surrounding an 800-year-old temple/mosque in the city of Ayodhya, even as trade liberalization and rapid economic growth proceed in this country at a dynamic pace.
17. Results for the communities are available from the authors upon request.
18. The number of observations for this estimation is fewer than those for the social trust questions by about 4000 observations, largely because there were many non-responses to questions about racial trust.
19. There can be both good and bad social capital. For example, Ogilvie (2004) argues that guilds in Early Modern Germany discriminated against and excluded women workers from participating in them by encouraging norms that girls should be denied apprenticeship, and that women, with some small exceptions, were not allowed to set up workshops.
20. There may be similar scope for action in other countries, but the complexities of social capital indicate that there should be caution in drawing generalized conclusions across countries. For instance, according to Nauck (2001), social capital measures such as trust are not strongly associated with educational attainment in Germany. This contrasts with the findings of this study.
21. Helliwell (2003) compares the assimilationist policy of the USA towards immigrants with that of Canada and argues that the policy of the former is less integrative as it produces more interracial tension in the USA. Alesina and Glaeser (2004) suggest that a major reason why the USA has had a less generous welfare system than Europe is that the higher levels of racial and ethnic diversity in the country have been exploited by politicians to divide groups from one another and have reduced the scope of public policy.

## REFERENCES


Aizer A. and Currie J. (2002) *Networks or Neighborhoods? Correlations in the Use of Publicly-funded Maternity Care in California*. Working Paper No. 9209. National Bureau of Economic Research, Cambridge, MA.

Akerlof G. (1997) Social distance and social decisions, *Econometrica* **65**, 1005–1027.

Alesina A., Devleeschauwer A., Easterly W., Kurlat S. and Wacziarg R. (2003) Fractionalization, *Journal of Economic Growth* **8**, 155–194.

Alesina A. and Glaeser E. L. (2004) *Fighting Poverty in the US and Europe: A World of Difference*. Oxford University Press, Oxford.

Alesina A. and La Ferrara E. (2000) Participation in heterogeneous communities, *Quarterly Journal of Economics* **115**, 847–904.

Alesina A. and La Ferrara E. (2004) *Ethnic Diversity and Economic Performance*. Working Paper No. 10313. National Bureau of Economic Research, Cambridge, MA.

Alesina A. and Rodrik D. (1994) Distributive politics and economic growth, *Quarterly Journal of Economics* **109**, 465–490.

Allen T. J. (1984) *Managing the Flow of Technology: Technology Transfer and the Dissemination of Technological Information Within the R&D Organization*. MIT Press, Cambridge, MA.

Arnott R. and Stiglitz J. (1991) Moral hazard and non-market institutions, *American Economic Review* **81**, 179–190.

Arrow K. (2000) Observations on social capital, in Dasgupta P. S. and Serageldin I. (Eds) *Social Capital: A Multi-faceted Perspective*. World Bank, Washington, DC.

Asheim B. and Gertler M. (2005) The geography of innovation: regional innovation systems, in Fagerberg J., Mowery D. C. and Nelson R. R. (Eds) *The Oxford Handbook of Innovation*, pp. 291–317. Oxford University Press, Oxford.

Barro R. and Sala-i-Martin X. (1995) *Economic Growth*. McGraw-Hill, New York.

Becker G. S. and Murphy K. (2000) *Social Economics, Market Behavior in a Social Environment*. Harvard University Press, Cambridge, MA.

Berkman L. F. and Glass T. (2000) Social integration, social networks, social support and health, in Berkman L. F. and Kawachi I. (Eds) *Social Epidemiology*, pp. 137–173. Oxford University Press, Oxford.

Beugelsdijk S. and Van Schaik T. (2005) Differences in social capital between 54 Western European regions, *Regional Studies* (present issue).

Boston Foundation (2001) *Social Capital in Boston*. Boston Foundation, Boston, MA.

Brock W. and Durlauf S. (1999) A formal model of theory choice in science, *Economic Theory* **14**, 113–130.

Brock W. and Durlauf S. (2001) Discrete choice with social interactions, *Review of Economic Studies* **68**, 235–260.

Brown G. and Harris T. (1998) *Social Origins of Depression*. Tavisock, London.

Cellini R. and Soci A. (2002) Pop competitiveness, *Banca Nazionale del Lavoro Quarterly Review* **55(220)**, 71–101.

Coleman J. (1988) Social capital in the creation of human capital, *American Journal of Sociology* **94**, 95–120.

Conley T. and Topa G. (2002) Socio-economic distance and spatial patterns in unemployment, *Journal of Applied Econometrics* **17**, 303–327.

Cooke P., Clifton N. and Oleaga M. (2005) Social capital, firm embeddedness and regional development, *Regional Studies* (present issue).

Dasgupta P. S. (2000) Population and resources: an exploration of reproductive and environmental externalities, *Population and Development Review* **26**, 643–689.

Dasgupta P. S. (2005) *Foundations of Social Capital*. Lecture Notes. University of Cambridge, Cambridge.

Dasgupta P. and Serageldin I. (2000) *Social Capital: A Multifaceted Perspective*. World Bank, Washington, DC.

DiPasquale D. and Glaeser E. (1999) Incentives and social capital: are homeowners better citizens?, *Journal of Urban Economics* **45**, 354–384.

Durlauf S. (2002) On the empirics of social capital, *Economic Journal* **112(483)**, 459–479.

Durlauf S. N. and Fafchamps M. (2004) *Social Capital*. Working Paper No. 10485. National Bureau of Economic Research, Cambridge, MA.

Easterly W. and Levine R. (1997) Africa's growth tragedy: policies and ethnic divisions, *Quarterly Journal of Economics* **112**, 1203–1250.

Fine B. (2000) *Social Capital Versus Social Theory: Political Economy and Social Science at the Turn of the Millennium*. Routledge, London.

Fukuyama F. (1995) *Trust: The Social Virtues and The Creation of Prosperity*. Free, New York, NY.

Garnsey E. and Heffernan P. (2005) High-technology clustering through spin-out and attraction: the Cambridge case, *Regional Studies* (present issue).

Glaeser E. (2001) The formation of social capital, *Isuma* **2**, 34–40.

Glaeser E., Laibson D. and Sacerdote B. (2002) An economic approach to social capital, *Economic Journal* **122(483)**, 437–458.

Glaeser E., Laibson D., Scheinkman J. and Soutter C. (2000) Measuring trust, *Quarterly Journal of Economics* **115**, 811–846.

Grabher G. (Ed.) (1993) *The Embedded Firm: On the Socio-economics of Inter-Firm Networks*. Routledge, London.

Granato J., Inglehart R. and Leblang D. (1996) The effect of cultural values on economic development: theory, hypotheses, and some empirical tests, *American Journal of Political Science* **48**, 607–631.

Granovetter M. (1973) The strength of weak ties, *American Journal of Sociology* **78**, 1360–1380.

Granovetter M. (1985) Economic action, social structure, and embeddedness, *American Journal of Sociology* **91**, 481–510.

Hall P. (1999) Social capital in Britain, *British Journal of Political Science* **29**, 417–461.

Heckman J. (1976) The common structure of statistical models of truncation, sample selection, and limited dependent variables and a simple estimator for such models, *Annals of Economic and Social Measurement* **5**, 475–492.

Heckman J. and Willis R. (1976) Estimation of a stochastic model of reproduction: an econometric approach, in Terleckyj N. (Ed.) *Household Production and Consumption*. National Bureau of Economic Research, New York, NY.

Helliwell J. F. (1996) *Economic Growth and Social Capital in Asia*, Working Paper No. 5470. National Bureau of Economic Research, CA.

Helliwell J. F. (2003) Immigration and social capital, Issue Paper given at the Policy Research Initiative Conference, 'The Opportunity and Challenge of Diversity: A Role for Social Capital?', Montreal, Canada, 2003.

Iyer S. (2002) *Demography and Religion in India*. Oxford University Press, Delhi.

Iyer S. and Weeks M. (2005) *Social Interactions, Reproductive Externalities and Fertility Behaviour in Kenya*. Mimeo, Faculty of Economics, University of Cambridge, Cambridge.

Kennedy S., Kiecolt-Glaser J. K. and Glaser R. (1990) Social support, stress, and the immune system, in Sarason B. R., Sarason I. G. and Pierce G. R. (Eds) *Social Support: An Interactional View*, pp. 253–266. Wiley, Chichester.

Kitson M. (2005a) Measuring capitalism: output, growth and economic policy, in Coates D. (Ed.) *Varieties of Capitalism, Varieties of Approaches*, pp. 29–46. Palgrave Macmillan, Basingstoke.

Kitson M. (2005b) The American economic model and European economic policy, *Regional Studies* **39**, 987–1001.

Kitson M., Martin R. and Tyler P. (2004) Regional competitiveness: an elusive yet key concept?, *Regional Studies* **38**, 991–999.

Kitson M. and Primost D. (2005) *Corporate Responses to Macroeconomic Changes and Shocks*. Report to the Economic and Social Research Council (ESRC), Swindon.

Knack S. (2000) *Social Capital and the Quality of Government: Evidence from the United States*, Policy Research Working Papers Series No. 2504. World Bank, New York, NY.

Knack S. and Keefer P. (1997) Does social capital have an economic payoff? A cross-country investigation, *Quarterly Journal of Economics* **112**, 1251–1288.

La Porta R., Lopez-de-Silianes F., Schleifer A. and Vishny R. (1997) Trust in large organisations, *American Economic Review* **87**, 333–338.

Loury G. (1977) A dynamic theory of racial income differences, in Lamond A. and Wallace P. (Eds) *Women, Minorities and Employment Discrimination*, pp. 153–186. Lexington Books, Lexington, MA.

Lucas R. E. (1993) Making a miracle, *Econometrica* **61**, 251–272.

MacGillivray A. (2002) *The Glue Factory – Social Capital, Business Innovation and Trust*. New Economics Foundation for the Association of Chartered Certified Accountants, London.

Marshall A. (1920) *Principles of Economics*, 8th Edn. Macmillan, London.

McFadden D. (1974) Conditional logit analysis of qualitative choice behaviour, in Zarembka P. (Ed.) *Frontiers in Econometrics*, pp. 105–142. Academic Press, New York, NY.

McFadden D. (1984) Econometric analysis of qualitative response models, in Griliches Z. and Intriligator M. (Eds) *Handbook of Econometrics*, Vol. 2, pp. 1386–1457. North Holland, Amsterdam.

Narayan D. and Pritchett L. (2000) Social capital: evidence and implications, in Dasgupta P. and Serageldin I. (Eds) *Social Capital: A Multi-faceted Perspective*, pp. 269–295. World Bank, Washington, DC.

Nauck B. (2001) Social capital and intergenerational transmission of cultural capital within a regional context, in Bynner J. and Silbereisen R. K. (Eds) *Adversity and Challenge in the New Germany and England*, pp. 212–238. Macmillan, Basingstoke.

North D. C. (1990) *Institutions, Institutional Change and Economic Performance*. Cambridge University Press, New York, NY.

O'Brien D. J., Phillips J. L. and Patsiorkovsky. V. V. (2005) Linking indigenous bonding and bridging social capital, *Regional Studies* (present issue).

Ogilvie S. C. (2004) How does social capital affect women? Guilds and communities in Early Modern Germany, *American Historical Review* **109**, 325–359.

Ogilvie S. C. (2005) The use and abuse of trust: social capital and its deployment by early modern guilds, *Jahrbuch für Wirtschaftsgeschichte/Economic History Yearbook* **2005**, 15–52.

Olson M. (1982) *The Rise and Decline of Nations: Economic Growth, Stagflation, and Social Rigidities*. Yale University Press, New Haven, CT.

Performance and Innovation Unit (2002) *Social Capital: A Discussion Paper*, April. PIU, London.

Porter M. E. (1998) Location, clusters and the new economics of competition, *Business Economics* **33**, 7–17.

Porter M. E. (2001) Regions and the new economics of competition, in Scott A. J. (Ed.) *Global City Regions*, pp. 139–152. Blackwell, Oxford.

Porter M. E. (2003) The economic performance of regions, *Regional Studies* **37**, 549–578.

Poterba J. (1996) *Budget Institutions and Fiscal Policy in the U. S. States*. Working Paper No. 5449. National Bureau of Economic Research, Cambridge, MA.

Putnam R. (1993) *Making Democracy Work: Civic Traditions in Modern Italy*. Princeton University Press, Princeton, NJ.

Putnam R. (1995) Tuning in, tuning out: the strange disappearance of social capital in America, *Political Science and Politics* **December**, 664–683.

Putnam R. (2000) *Bowling Alone: The Collapse and Revival of American Community*. Simon & Schuster, New York, NY.

Putnam R., Leonardi R. and Nanetti R. Y. (1993) *Making Democracy Work: Civic Traditions in Modern Italy*. Princeton University Press, Princeton, NJ.

Roper Center (2001) *Social Capital Benchmark Survey, 2000*. Roper Center for Public Opinion Research Data Archive, University of Connecticut at Storrs, CT.

Saxenian A. (1989) The Cheshire cat's grin: innovation regional development and the Cambridge case, *Economy and Society* **18**, 448–477.

Segal Quince Wicksteed (1985) *The Cambridge Phenomenon: The Growth of High Technology Industry in a University Town*. Segal Quince Wicksteed, Cambridge.

Shaw G. K. (1992) Policy implications of endogenous growth theory, *Economic Journal* **102**, 611–621.

Shleifer A. and Vishny R. (1993) Corruption, *Quarterly Journal of Economics* **108**, 599–617.

Solow R. (1956) A contribution to the theory of economic growth, *Quarterly Journal of Economics* **70**, 65–94.

Solow R. J. (1957) Technical change and the aggregate production function, *Review of Economics and Statistics* **39**, 312–320.

Srinivas M. N. (1994) *The Dominant Caste and Other Essays*, Revd Edn. Oxford University Press, Oxford.

Stiglitz J. E. (1996) Lessons from the East Asian miracle, *World Bank Research Observer* **11**, 151–177.

Storper M. (1995) Competitiveness policy options; the technology–regions connection, *Growth and Change* **Spring**, 285–308.

Tura T. and Harmaakorpi V. (2005) Social capital in building regional innovative capability, *Regional Studies* (present issue).

Varshney A. (2000) *Ethnic Conflict and Civic Life: Hindus and Muslims in India*. Yale University Press, New Haven, CT.

Western J., Stimson R., Baum S. and Van Gellecum Y. (2005) Measuring community strength and social capital, *Regional Studies* (present issue).

Westlund H. and Nilsson E. (2005) Measuring enterprises' investments in social capital: a pilot study, *Regional Studies* (present issue).

Williams C. C. (2005) Fostering community engagement and tackling undeclared work: the case for an evidence-based 'joined-up' public policy approach, *Regional Studies* (present issue).