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# **Indigenous Australians in the Labour Market: Exploring the Role of Social Capital**

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## ABSTRACT

*This paper explores the role of social capital externalities in the labour market outcomes of Aboriginal and Torres Strait Islander Australians, a culturally distinct and highly disadvantaged group in Australian society. Data from the 2002 National Aboriginal and Torres Strait Islander Social Survey are used to construct measures of the quantity and diversity of social capital that an individual may utilise. While contextual in nature, we find that the externalities which stem from these forms of social capital have a strong association with labour market participation and the ability to secure meaningful employment, consistent with a “bonding, bridging and linking” conceptualisation previously proposed in the theoretical literature. From a practical standpoint, the results raise important considerations for individuals and organisations who aim to address Indigenous disadvantage through the labour market.*

## 1. INTRODUCTION

This paper explores the role of social capital externalities in determining labour market outcomes for Indigenous Australians.<sup>1</sup> Using the 2002 National Aboriginal and Torres Strait Islander Social Survey (NATSISS), the central relationship tested is the empirical link between social capital, operationalised through measures of network structure, and the labour market outcomes of Indigenous<sup>2</sup> Australians. In terms of theory, this paper seeks to augment the emerging conceptualisation of social capital. From a practical standpoint, the results raise considerations for both policy and practice in addressing Indigenous disadvantage through the labour market.

The analysis concentrates on labour force participation rates and mainstream employment as the indicators of labour market outcomes. To explore the role of social capital in the labour market outcomes of Indigenous Australians, three hypotheses, which relate social capital to labour market outcomes at each stage, are presented. These hypotheses are:

- 1) The quantity of social capital which an individual may utilise is positively related to labour market outcomes.
- 2) The diversity of the social capital which an individual may utilise is positively related to labour market outcomes.
- 3) The relationship between social capital and labour market outcomes varies according to the context of (a) geographic location and (b) gender.

This work should be considered exploratory. Social capital theory is still at a formative stage in terms of its conceptualisation and even more so with respect to its operationalisation in empirical work. However, we believe that it provides a potentially fruitful approach for reassessing the unacceptable disparity between the

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<sup>1</sup> The authors would like to thank Phillip A O’Hara and Benjamin S Wyatt for their input and critique in developing this research.

<sup>2</sup> The term “Indigenous” refers to individuals of Aboriginal, Torres Strait Islander, or both Aboriginal and Torres Strait Islander origin (ABS 2004b).

living standards of Indigenous Australians and non-Indigenous Australians, because it explicitly recognises both the role and value of culture, as embodied in networks.<sup>3</sup> Policies to address Indigenous disadvantage have failed to come to terms with these contradictory effects of culture, and it is hoped that such an approach may contribute to finding a way forward from the current impasse.

Section 2 provides a brief contextual background on Indigenous Australians' position in the labour market, encompassing two key aspects for the ensuing analysis: geographical distribution and the role of the Community Development Employment Program. Section 3 provides a review of the literature and the theoretical foundations for the analytical framework. The core concepts of social capital are introduced and the nature of their relationship to economic outcomes is discussed. Section 4 provides the dataset, modelling strategy and the key constructs, as well as descriptive statistics that show the incidence of labour market outcomes and social capital at varying levels of remoteness. Section 5 provides the results of multivariate analysis for participation and mainstream employment under models utilising demographic, human capital and other relevant explanatory variables in conjunction with social capital indicators. Section 6 discusses the results in light of the bonding, bridging and linking conceptualisation and their practical implications for individuals and organisations. Section 7 concludes.

## **2. INDIGENOUS AUSTRALIANS IN THE LABOUR MARKET**

It has been estimated that Aborigines had inhabited the continent now known as Australia for at least 40,000 years prior to the European settlement that commenced with the landing of Captain James Cook at Botany Bay in 1770. The Australian Aborigines were tribal peoples who maintained a hunter-gatherer existence, and whose customs and practices evolved into a culture in which their relationship with the land holds particular significance. Ultimately, colonisation led to the wide-spread decimation of the Indigenous peoples' traditional way of life, but this has been replaced with neither a workable coexistence of cultures nor a successful integration of Indigenous people into the 'mainstream' economy.

Initially many Indigenous people were forcibly displaced from their lands, some even systematically killed by poisoning and shooting. Government policies in place throughout much of the 1900s and designed to assimilate Indigenous people into Western society saw the forced removal of children from their families, creating 'the Stolen Generation'. Further dislocation occurred as a consequence of the 1965 Equal Wages Case, which led to Indigenous people living on pastoral properties being rounded up from their traditional lands and moved into the outskirts of regional

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<sup>3</sup> Culture and networks are intertwined in a process of circular and cumulative causation. The structure and sentiment of social relationships, which make up a network, shape culture. At the same time, the beliefs and behaviours that make up culture shape networks. Therefore, while it may be interpreted that the size and/or diversity of an individual's social networks may provide a loose indication of the extent to which the individual is connected with non-Indigenous social structures, this does not provide an accurate or valid measure of the extent to which the individual values, or practices, traditional Indigenous culture. It cannot be interpreted that an individual with large and diverse networks places a low value on Indigenous culture. Nor can it be assumed that an individual that has small, homogenous networks places a high value on traditional patterns of belief.

towns. Legal recognition as Australian citizens and eligibility to welfare payments were not granted until the latter half of the 1960s. Policies promoting Indigenous self-determination and a separate Indigenous governing body overseeing the delivery of many programs to Indigenous people have since come and gone, but with limited progress in resolving the plight of Indigenous Australians.

Today, the gap between the wellbeing of the Indigenous and non-Indigenous populations remains an embarrassing skeleton in the closet of an otherwise affluent country. Indigenous people make up only 2.2 percent of the Australian population. Their life expectancy of 62 years is around 17 years lower than that of non-Indigenous Australians, and they fare similarly poorly across the broad spectrum of indicators of social and economic outcomes. Indigenous Australians have markedly lower levels of educational attainment and home ownership, and are 13 times more likely to be imprisoned than non-Indigenous Australians (SCRGSP 2007).

The disadvantages facing Indigenous people extend to the labour market, manifest in lower rates of labour force participation and, for those who do participate, unemployment rates typically around three times the national average. However, the labour market picture is complicated by several factors. First, Indigenous persons disproportionately reside in remote and very-remote areas with little mainstream employment opportunity. The Australian population is in fact highly urbanised, with around two-thirds of the population living in the major cities. In contrast, 30 percent of Indigenous Australians live in the major cities. Figures from the 2001 Census show 27 percent living in areas classified as remote or very remote, compared to only two percent of the non-Indigenous population (SCRGSP 2007: 5)

Second, a substantial number of Indigenous persons participate in the Community Development Employment Program (CDEP) and it is questionable whether such activities should be considered to be 'employment' as conventionally measured (Dockery & Milsom 2007). Introduced in 1977, the CDEP was seen as a way of ameliorating the negative effects of passive welfare receipt. It allowed the unemployment benefit entitlements of the individuals in remote communities to be pooled, and distributed by 'paying' people to work on projects established by the Communities' representative organisations. The CDEP was modelled on similar schemes in the US, and has been widely regarded as one of the most successful Indigenous employment programs, although more recently it too has come to be viewed as a form of passive welfare that reduces incentives for Indigenous people to engage with the mainstream labour market. The scheme was initially intended to operate only in remote areas where no formal labour market existed, but subsequently expanded into larger regional towns and even metropolitan areas.

Currently there is some uncertainty regarding the future of the CDEP scheme, and, it would be fair to say, the Commonwealth and State governments are struggling to establish a clear direction in the more general policies to address Indigenous disadvantage. It is clear that policy measures must take account of the different circumstances facing Indigenous people in remote and non-remote areas. Equally, any analysis of Indigenous employment outcomes must pay attention to possible

differences between remote and non-remote areas, and the potentially confounding affects of the CDEP scheme.

### **3. AN ANALYTICAL FRAMEWORK FOR SOCIAL CAPITAL**

The starting point for this analysis of the relationship between social capital and labour market outcomes is the Organisation for Economic Cooperation and Development (OECD) definition of social capital, “networks together with shared norms, values and understandings which facilitate cooperation within or among groups” (ABS 2004a, p5). This provides a clear framework for the key social capital concepts of collective action, forms and scope.

#### *3.1 Social capital and collective action*

Social capital is useful because it provides a resource to collective action (Ostrom & Ahn 2003) that produces economic outcomes of varying social scale (Stone & Hughs 2002).<sup>4</sup> Characterising capital as a stock of durable structures that provide a flow of use values, and social capital as a resource to collective action, it follows that social capital is durable structures that produce a flow of use value by aiding the solution of collective action problems. In this manner, social capital can be thought as the “rules of the game” that shape the strategies of the players - and thus the outcome of the game - (Svendsen & Svensen 2003) and it may be utilised as a tool available to rational economic agents who aim to increase their present or future production (Piazza-Georgi 2002).

#### *Forms of social capital*

According to the multiple capital paradigm, capital may come in a number of manifestations (O'Hara 2001). Social capital is no exception and the manifestations, or forms, commonly used in economic literature are norms, institutions and networks.<sup>5</sup> Different conceptualisations attach different weightings to each. A network-centric view, traced through the works of Granovetter (1973; 1985), Coleman (1998) and Burt (1992) to Dasgupta (2000) that is appropriate for microeconomic labour market analysis places networks above norms and institutions. More specifically, it argues that norms and institutions are contained within networks.

A general economic definition of a network is “personalized exchange among many agents” (Kortum 2003). Importantly, these exchanges have two dimensions, the structure of exchanges and the norms and institutions, or sentiment that characterizes them.

The latter, norms and institutions (formal and informal),<sup>6</sup> or sentiment is based on the beliefs and values of a group and refer to the informal and formal rules which govern

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<sup>4</sup> Captured by the OECD definition’s reference to cooperation, collective action is at the core of a vast array of economic activity.

<sup>5</sup> These are included in the OECD definition through reference to “networks together with shared norms, values and understandings”

<sup>6</sup> The study of beliefs, values and institutions is not new to economic literature. Critical contributions which have had a distinct impact on the development of social capital include Veblen who examined the value of

an economic agent's behaviour. They are the cognitive aspect of social interaction incorporating concepts such as trust or reciprocity and represent a general form of social capital. The former, the structure of relations, is the pattern of exchange that governs behaviour and constitutes the second generalised form of social capital.

Far from being independent, the structure and cognitive dimensions of socio-economic interaction within networks are tightly intertwined. The structure of relations shapes the quality of interactions while at the same time network contents mould structure. In a dynamic framework both dimensions evolve through time, thus they are often associated with culture.

### *3.2 Scope of social capital*

The scope of social capital has both a vertical and horizontal dimension.<sup>7</sup> As is set out in Grootaert & van Bastelaer (2001), the vertical dimension of social capital ranges from micro to macro level analysis.<sup>8</sup> At the micro level the unit of observation is the individual and features of social organization such as the relationships and interactions between individuals are analysed. At the meso level the unit of analysis is the group, hence the social organization of groups within the broader social structure becomes relevant. At its most broad, macro level analysis is of formal institutionalized relationships and structures that form the basis for society a whole. The horizontal dimension is merely the interaction between units at each level.

### *3.3 Dimensions of social capital*

Combining forms and scope provides a multi-dimensional framework, which covers four key quadrants. The complete social capital analysis covers all four, however this is not always possible and therefore social capital researchers will often focus on one, or a combination of quadrants. At this stage even when a multidimensional framework is possible, the manner in which such a framework is mobilised to cover the range of complex variables is still open to experimentation and interpretation (Stone & Hughs 2002).

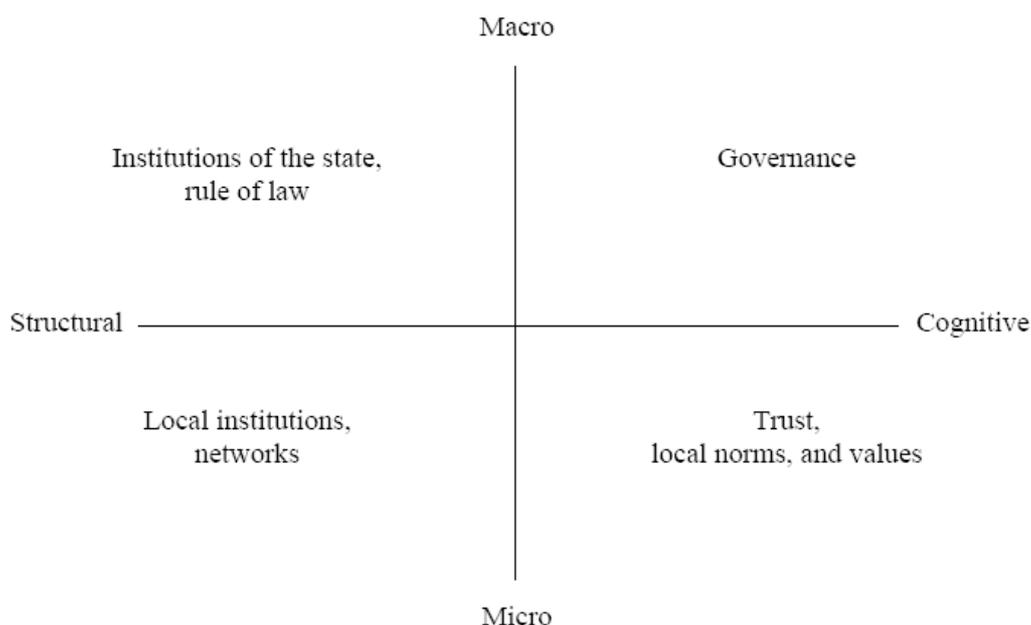
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human traits for the "collective life processes"(Veblen 1970, 1889), Weber (2001, 1905) who explained collective economic outcomes as a consequence of religious culture and Polanyi (1975, 1944) who argued that the inclusion of the non economic was critical in understanding "embedded" market outcomes. A more recent example of this approach is the "new cultural economics" of Guiso, Lapienza & Zingales (2006) who review existing approaches and develop an empirical model that draws on the theoretical approach taken by Landes (1998). They argue that by utilizing a narrow definition of culture and a two step process it can be shown that economic outcomes are strongly influenced by cultural factors. More specifically, that their empirical method is able to show a link from culture to beliefs and values, which in turn shape behaviour and economic outcomes.

<sup>7</sup> Hence the OECD definition does not specify a particular unit of observation.

<sup>8</sup> In many instances there is both substitutability and complimentary between the vertical dimensions of social capital (Grootaert & van Bastelaer 2001)

**Figure 1: Dimensions of Social Capital**



Source: (Grootaert & van Bastelaer 2001)

### 3.4 Social capital externalities and economic outcomes

The network-centric social capital approach followed here stems from sociologist Mark Granovetter (1985) and draws on the notable contributions of Coleman (Coleman 1988), Bourdieu (1986) and Burt (1992) who focus on micro and meso level analysis and Putman (1993; 1995) and Fukuyama (1995) who focus largely on the macro level. The essence of this body of work is that social capital is the “rules of the game” for socioeconomic interaction. When interaction takes place it creates externalities that affect economic outcomes via their affect on transactions. In economic terms the quantifiable impact of social capital on productivity will be determined by the scope of the externalities of the network.<sup>9</sup>

This can be illustrated by the simplified aggregate production function equation (3.1), where output,  $Y$ , is a function of a given quality of capital,  $K$ , labour,  $L$ , and human capital,  $H$ . This function is shifted by the parameter  $A$  which reflects technological development.

$$Y = A f(K, L, H) \tag{1}$$

If the externalities of a network are confined to a particular individual or group within society, as in Bourdieu (1986) and Burt (1992), the social capital augments the human capital,  $H$ , of the individuals involved and the impact is micro or meso in nature. However, if the externality of the network spreads to wider society, as in Putman

<sup>9</sup> Dasgupta (2000) provides a neat synthesis of how social capital externalities operate. Social capital is networks of interpersonal relationships that contain institutions. Institutions are based on beliefs, which in turn stem from culture. Therefore whether formal or informal, institutions are important because they link beliefs shaped by culture to behaviour and thus productivity.

(1993; 1995) and Fukuyama (1995), the impact is macro. In this case the economic affect is a shift in the entire production function (think of this as a social technology) by augmenting the technology parameter,  $A$ , in front of the production function.

Network externalities may be positive, negative or both.<sup>10</sup> In many cases there will be competing externalities as the structure and cognitive aspects of social relations that benefit one particular individual or group may harm another. As Glaeser, Laibson and Sarcedote (2002) discuss, the complexity of aggregation leads to the problem that it is often difficult to ascertain the overall effect of a number of competing externalities.

As discussed by Collier (1998), positive externalities improve the rules of the game via channels of information transmission, or through behavioural characteristics such as trust and reciprocity. On the other hand, as discussed by Portes (2000) and Streeton (2002), negative externalities occur when networks constrain or hinder collective action through exclusion and creating negative behavioural characteristics. In these cases, rather than being social capital, the durable structures become asocial, antisocial or negative social capital.

Externalities will result from qualitative dimensions of networks, structural dimensions of networks, or a combination of both in conjunction with other contextual variables such as geographic location and the level of economic development. In analysing these pathways the structure and cognitive aspects of networks are central, as is the context. Each must be considered because the interaction between social capital dimensions and context has important implications for the nature of the externality and thus the economic impact of social capital.

As both structural and cognitive elements are highly intertwined, a particular structure may facilitate the development of certain beliefs and vice versa.<sup>11</sup> This complexity of interactions leads some scholars to classify social capital by a separate typology of bonding, bridging and linking which can be used to analyse social capital externalities at the micro, meso and macro levels. Linking social capital may be thought of as the extent to which individuals are connected to and trust the formal institutions of society. Bonding social capital often refers to dense, culturally homogenous networks of individuals characterized by high levels of trust that provide the resources utilised by individuals for support and bridging social capital is characterized by sparse, diverse networks that provide resources such as opportunities and information that the individual uses to advance their economic wellbeing. Each of bonding, bridging and linking may produce positive or negative externalities depending on the context.

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<sup>10</sup> For example, the externality may be positive for one individual, group or society while at the same time negative for other individual group or society.

<sup>11</sup> Values such as a belief in the importance of education, a generalized level of trust, or a norm of reciprocity between members of the community may be enhanced as a result of the cognitive aspects, or sentiment of a particular network. These cognitive aspects may in turn be shaped by network structure as frequent interaction between diverse groups builds general levels of trust. Beliefs may mould network structure. Acceptance of cultural diversity may lead to changes in structural elements such as businesses extending employment and agents in financial markets extending venture capital to previously excluded minority groups.

Indeed, Woolcock (2001) argues that it is different combinations of bonding, bridging and linking that explain the diversity of findings in the social capital literature.

Finally, as with all forms of capital the stock of social capital evolves. O'Hara's (2007) dynamic circuit of social capital indicates that existing stocks of social capital will be reinforced through time if the externalities augment the direct outcomes of reproducing that capital or support existing institutions and patterns of interaction. It follows that existing stocks of social capital will change and evolve to new patterns if the externalities undermine the direct outcomes of reproduction.

### *3.5 Social capital and the labour market*

Social capital in the labour market is a rapidly developing field of study with studies covering a wide range of employment related outcomes such as business start-up, earnings, employment, formal labour market participation and job tenure (Aguilera 2002). Moreover, when the labour market literature is viewed more broadly there are distinct similarities between social capital and other fields as many economists use the terms "networks" and "social capital" interchangeably. Strong parallels can be drawn with economic and sociological studies that have used utilised networks such as models of exogenous information networks, models of neighbourhood or proximity effects, evolutionary models of social structure, models of strategic network formation and endogenous information networks (Ioannides & Datcher Loury 2004).<sup>12</sup>

While much of the work in modelling social capital and employment outcomes has stemmed from Granovetter's (1973) strength of weak ties thesis, Bourdieu's (1986) "embodied social capital" representing the intergenerational transfer of networks, relations and behavioural characteristics provides a clear illustration of how social capital may affect the supply and demand sides of the labour market at a micro level. On the supply side of the labour market his analysis would indicate that social capital augments (while asocial capital diminishes) the skills and abilities of the individual and thus may have positive or negative consequences for employment outcomes in a similar manner as human capital.<sup>13</sup> On the demand side, social capital will have a significant effect on the beliefs and information regarding candidate productivity and thus will affect labour market outcomes.

In modelling these outcomes there are three stages that should be examined. Firstly, there is the labour supply, or participation decision made by the individual. Second, for labour market participants there is the employment outcome that is determined in the labour market. Third is the ability of the individual to remain in employment. Social capital is important at all stages, but the relationships are often particularly

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<sup>12</sup> Ioannides and Datcher Loury use the terminology of "networks" rather than "social capital".

<sup>13</sup> The relationship between social capital and human capital is complex. Indeed, social capital may be a compliment to, or a substitute for human capital. Social capital may be complimentary by combining with human capital to enable an individual to obtain desired outcomes. For example, social capital may create informational externalities within the workplace that provide an individual with opportunities to utilise their skills and abilities to further their career. In contrast, social capital may provide a substitute for human capital by allowing an individual to obtain desired outcomes within the need to utilise their own skills and abilities. Such a situation may occur when an individual does not participate in the labour market as their family provides all the services they require for an acceptable standard of living.

difficult to disentangle and therefore empirical results should be interpreted with caution. In this study we focus on stages one and two.

Two studies that look at the participation decision are Stone, Gray & Hughs (2003) and Aguilera (2002). Stone, Gray & Hughs contend that social capital externalities alter participation through the impact that it has on an individual's valuation of market versus non market time and hence their preferences regarding the work/leisure trade off. Social capital externalities may affect the value placed on time spent with family and friends, they may affect norms of behaviour regarding whether it is "appropriate" for certain group members such as women to participate, or they may alter the need to work through the provision of resources. In contrast, Aguilera focuses on social capital externalities that transfer knowledge about employment and appropriate behaviour far less "expensively" than personal experience. He finds that the nature of an individual's social resources will affect the information they receive, which in turn alters their perceptions regarding the probability of finding employment and thus their choice of whether to participate in the labour market.

The key role social capital plays in the probability of employment, is in the effect that sentiment and information have on search behaviour within the labour market. In particular, the focus is on the channels through which information and sentiment alter the efficiency and effectiveness of job matching.<sup>14</sup>

Social capital externalities operate on both the demand and supply side of search behaviour through their effect on search cost, the quality of match between employer and employee and the impact they have on the beliefs and values held regarding particular individuals or organisations. Social capital may lead to reduced cost and improved match, however asocial, or a lack of social capital may exclude individuals from employment opportunities or reduce the quality of match.

On the supply side social capital may affect the type and effectiveness of job search method used. In particular, social capital has implications for the number of offers received, probability of success and the quality of position that can be achieved through the use of information provided by personal contacts (Aguilera 2002). For example, these contacts may provide information about job openings or the appropriate behaviour to secure employment such as personal conduct required in an interview. Externalities will be affected by the size and diversity of social capital that

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<sup>14</sup> In considering the role of networks in job search outcomes, Ioannides and Datcher Loury (2004) present seven stylized facts regarding employment outcomes and social networks in the labour market. They argue that the structure and sentiment of networks matter because; (1) there is widespread use of contacts in job search and this use has increased through time; (2) this use of networks varies by location and by demographics; (3) job search through contacts is productive & often leads to better results, but these results are not equal for all individuals; (4) Part of the variability in the productivity of networks in job search is due to differences in usage by different demographic groups; (5) a significant proportion of the variability in productivity of networks cannot be explained by differences in usage by different demographic groups; (6) there is increased use of the internet; and (7) there are large cross country, regional & industry differences in the use of networks. Importantly as the social capital literature has contended, the authors recognise that when examining labour market outcomes context is critical. Externalities will vary significantly due to heterogeneity of the individual, of firms, of the contacts of the individual and of the nature of the relationships between individuals.

may be accessed as well as demographic factors such as gender, ethnic and spatial differences (Stone, Gray & Hughs 2003).

On the demand side of the market, employers may use social networks as an inexpensive and effective signalling and screening mechanism. As Marsden & Gorman (2001) argue, referrals through social networks reduce employer uncertainty regarding productivity. More specifically, referrals through social networks may increase firm profits as they provide a less expensive recruitment channel than formal methods, high ability employees, employees that have both a better understanding of the employment requirements and employees that are well suited to the firm's culture (Montgomery 1991).

Alternatively, asocial capital may lead to discriminatory practices within the labour market. Particular demographic groups may be excluded from particular professions or the labour market altogether as a result of sentiment fostered by the structure and cognitive aspects of social exchange. For example, employers may exclude particular candidates by utilising existing social networks to fill positions, or make negative assumptions regarding candidate productivity without reference to the characteristics, or merits of that particular candidate.

Indeed, Hunter (2004) argues that 50 percent of Indigenous employment growth can be attributed to little understood demand side factors. He argues that the effect of structural racial discrimination on Indigenous employment is significant and that a lack of social capital may be impeding Indigenous entrepreneurship, one of the most important means of circumventing this social exclusion. In subsequent work, Hunter & Gray (2006), provide evidence which supports this thesis. They find that asking friends and relatives as part of a job search is not significant in determining either the probability of obtaining employment, or the probability of obtaining and retaining employment for Indigenous Australians.

Given this appreciation of social capital in a labour market context, theory suggests that in exploring whether social capital has a place in understanding the labour market outcomes of Indigenous Australians three hypotheses may be tested. First, the quantity of social capital which an individual may utilise is positively related to the probability of participation, official employment and mainstream employment. As the quantity of social capital that an Indigenous individual has access to increases, it is more likely that the individual supplying labour will (1) acquire increased volume of information regarding job vacancies and appropriate behaviour and (2) adopt behavioural norms that increase their employment prospects. On the demand side there is an increased probability that (3) the individual receives a referral to an employer.

Second, the diversity of the social capital which an individual may utilise is positively related to the probability of participation, official employment and mainstream employment. As the diversity of social capital increases it is likely that the individual supplying labour will (1) acquire increased range of non redundant information

regarding job vacancies and appropriate behaviour and (2) adopt behavioural norms that increase their employment prospects. On the demand side there is an increased probability that (3) the individual receives a referral to an employer.

Third, context is critically important. The affect of social capital will vary according to differences in individuals and firms as well as heterogeneity in the structure and sentiment of social relationships. Therefore with quantity and diversity held constant, the relationship between social capital and the labour market outcomes of Indigenous Australians varies by (a) geographic remoteness and (b) gender.

#### **4. MODELLING STRATEGY AND DATA**

Data from the 2002 National Aboriginal and Torres Straight Islander Social Survey (NATSISS) are used to construct proximal indicators for a number of separate dimensions of social capital that an individual may access, plus a composite index of these measures which is intended to capture both access to and diversity of social capital. These are then included as explanatory variables in multivariate regression models of the likelihood of Indigenous persons of working age participating in the labour force and, conditional upon participation, the likelihood of being in 'mainstream' employment as opposed to being unemployed. In the latter model, CDEP participants are removed from the sample to abstract from the impact of this scheme. The hypothesised contextual nature of social capital externalities is tested by separate estimation by gender and the inclusion of interaction terms between the social capital variables and geographic location. This section describes the data and construction of the variables, and the results of the multivariate models are reported in the following section. Definitions of all variables used in the analysis are provided in Table A1 of the Appendix, along with their sample means.

##### *4.1 Data: the 2002 NATSISS*

Building upon the 1994 National Aboriginal and Torres Straight Islander Survey (NATSIS), the 2002 NATSISS, collected by the Australian Bureau of Statistics (ABS) between August of 2002 and April of 2003, was the second in what is to become a 6 yearly series of Indigenous social surveys. The purpose of the survey was fivefold, it aimed to provide a broad range of information; insight into multiple social disadvantages through exploration of different interrelationships of areas of social concern; cross section comparison to general survey data; and the ability to measure change from the previous NATSIS in 1994. More broadly, the survey was designed to enable the joint analysis of social circumstance and socioeconomic outcomes for Indigenous Australians by collecting a multi-dimensional range of information (ABS 2004b). The content, which was determined through a widespread consultation process to reflect Indigenous cultural values and priorities, covers diverse topics including demographics, culture and language, family and community, health, housing, education, employment, income, financial stress, information technology, transport and crime and justice.

The sampling frame was that data would be rich enough to derive meaningful conclusions at the national and sub-national level. Data can be segmented at by State/Territory or by Australian Standard Geographic Classification (ASGC). ASGC classifications available in the NATSISS include four levels which, in order of increasing remoteness, are; Major Cities; Inner Regional; Outer Regional and Remote and Very Remote. The sample, which was collected using dual collection methods, was spread over different geographic regions to ensure that estimates of common characteristics, possessed by more than 10% of the Indigenous population, would have a relative standard deviation of 20 percent or less.<sup>15</sup>

#### *4.1 Measuring social capital*

The strengths and weaknesses of the NATSISS for labour market analysis have been discussed in multiple papers such as (Biddle & Hunter 2006) and Gray & Chapman (2006). From a social capital perspective the unique strengths of this dataset are twofold. First, the wide range of unusual variables collected allows proximal measures of social capital to be constructed. Second, the inclusion of geographic variables allow for the effect of context to be captured.

The ideal empirical framework, operationalising social capital theory for analysis of labour market hypotheses, would cover all four quadrants of Figure 1. While incorporating a number of strengths, the NATSISS limits analysis to a structural-micro approach represented by the bottom-left quadrant. The form of social capital emphasised is the network, the dimension investigated network structure and the unit of analysis, or social scale, is the individual. As is often the case for social capital researchers, the framework chosen is limited by available data and here social capital is operationalised through proximal indicators of network structure, which provide useful, albeit imperfect measures of network size and network diversity.<sup>16</sup>

To capture an individual's network structure, variables are drawn from the 2002 NATSISS, which provide proxies for the stock of social capital across five spheres of social structure: Indigenous culture, general social activities, sports, volunteering and support networks in times of crisis. While there are many commonalities, it is likely that social networks in each of these spheres provide independent and interrelated resources. To capture both their separate and interconnected effects, six distinct binary dummy variables are constructed for the social spheres (separate effects) and

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<sup>15</sup> Data collection was implemented via two distinct methods. Each uses slight variations in interview techniques, questions and output. The first, the Community Area (CA) method, was a sample of discrete Indigenous communities taken using pen and paper interviews. The second, the Non Community Area (NCA) method, was a sample of dwellings not within the boundaries of the community areas taken using computer assisted interviewing. Individuals sampled were limited to those over the age of 15 who were the usual residents of a private household. In total the sample size was 9359 individuals from 5887 private households with no more than three individuals from any one household included.

<sup>16</sup> Proximal indicators refer to outcomes that are directly related to the core structural or cognitive dimensions of social capital. They do not directly measure social capital. Despite close links to social capital theory, there are two caveats to the use of proximal indicators of network structure. First, theory indicates that the social capital is a multidimensional concept. The externalities that result from social capital resources depend on both structure and sentiment of the network of relationships. Despite the fact that sentiment and structure are intertwined, measures of network structure can only yield a partial understanding of sentiment. Second, while proximal indicators of social capital provide a value closely related to the core concept of network structure, they do not directly measure social capital. Care must be taken in drawing inferences based on these variables.

then these are combined to form an overall index of network structure (interrelated effects). Networks related to Indigenous culture are captured by a dummy variable indicating whether or not the individual attended or participated in a cultural event in the past 12 months. The measures of the stock to social networks are similarly based on reported participation in related activities for social networks (reported participation in social activities in the past three months); sporting organisations (participated in sport or physical activities in the last 12 months); and volunteer organisations (participation in unpaid volunteer activities in the past 12 months).

Two forms of support in times of a crisis are investigated, based on the response to a question on whether or not the individual would have support in a time of crisis and, if so, the source of that support. The presence of personal support networks relates to support from friends and family, whereas the presence of institutional support captures networks relates to organisations. Nominating 'work colleague' as the source of support in the time of crisis, was not used in determining the presence of either personal support or institutional support, as this would create an endogeneity problem in modelling employment outcomes. Finally, an index of social capital is also generated by simply summing the above six social capital variables. The index captures both the size and diversity of an individual's social capital in that each of the individual variables measure a different, although to some extent overlapping, sphere of social networks.

#### *4.2 Dependant variables - labour market outcomes*

Utilising the 2002 NATSISS allows the construction of a number of labour market outcomes for social capital analysis. Those constructed here are the binary outcomes; "Participation" and "Mainstream Employment". Participation captures the stage one labour market outcome of whether an individual chooses to participate in the labour market. Participants are individuals between the age of 15 and 65 who are classified as "unemployed" or "employed" by the ABS.<sup>17</sup> In contrast, mainstream employment captures the stage two labour market outcome of whether, once participating in the labour market, an individual is able to secure meaningful employment. Those who are mainstream employed include all persons classified as "employed" by the ABS with an adjustment to remove CDEP participants.<sup>18</sup> The stage three outcome of whether the individual remains in employment is not analysed as the 2002 NATSISS includes no data regarding the duration of employment.

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<sup>17</sup> Individuals who are not participants include individuals which the ABS describes as "who are retired; no longer working; do not intend to work in the future; permanently unable to work; or who have never worked and never intend to work" (ABS 2004b, p78)

<sup>18</sup> According to the ABS employed individuals are "persons who had a job or business, or who undertook work without pay in a family business, in the week prior to the survey for a minimum of one hour per week. Includes persons who were absent from a job or business. Includes CDEP participants" (ABS 2004b, p75). Mainstream, or non-CDEP employment, has been made use of by a number of studies (Gregory 2006; Halchuk 2006; Hunter 2006; Ross 2006). CDEP employment is not subject to the same market forces and individual incentives as the general labour market (Hunter 2006). Including CDEP participants as "employed" in the analysis of those remote and very remote regions distorts results and may lead to misleading findings or incorrect inferences.

### *4.3 Other explanatory variables*

A range of socio-demographic, human capital and other relevant variables expected to impact upon labour market outcomes (see Hunter 2004, Hunter & Gray 2006, Ross 2006 & Halchuk 2006) are included as controls in order to identify the independent effect of social capital.

Socio/demographic variables included are age, social marital status and the number of persons living in the household. Age is broken into dummy variables covering five or 10 year intervals. The human capital variables included cover health, education and communication abilities. Health status is captured using a series of create dummy variables relating to self assessed general health and a dummy variable for existence of a disability.<sup>19</sup> English language ability is proxied by a binary variable indicating whether the individual experiences difficulties communicating with service providers.

Other variables included cover mobility (how many dwellings the individual has lived in over the past 12 months), computer usage in the past 12 months and whether the individual has been incarceration in the past five years. Computer usage could be interpreted as capturing either access to technology or computer literacy. There is potential for joint endogeneity, or “simultaneous bias” between computer usage and employment outcomes as employment will, in many cases, increase the access to technology. We address this by giving the variable a value of one only if the respondent indicates that they have used a computer somewhere other than ‘at work’ (See Appendix table A1 for details). Halchuk (2006) further argues that this is partly overcome by the fact that the NATSISS data is recursive. The individual reports their employment status at time  $t$ , however their computer use relates to the 12 months prior to time  $t$ .

### *4.4 Descriptive statistics*

Table 1 presents the incidence of labour market participation (1a) and mainstream employment (1b) by social capital variables. Each value represents the proportion of a segment of individuals (defined by gender and remoteness), which are participants or mainstream employed, given that they have access to (value of one), or do not have access to (value of zero), the networks captured by each variable. Alternately each value may be interpreted as the likelihood an individual will be a labour market participant or mainstream employed given their gender, remoteness and whether they have access to a particular set of networks.

Examination of these results indicates in general, the quantity of social capital an individual may access has a positive effect on labour market outcomes, that the effect varies according to context and, in some cases, participation and mainstream employment rates are particularly low. For example, aside from networks related to Indigenous culture, where the association is in many cases negative (suggesting asocial capital), there is a consistent, positive association between each proximal indicator of social capital and participation, or mainstream employment. Closer examination of the

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<sup>19</sup> For a discussion on the use of self assessed health status as a measure of an individual’s health and issues related to causality when examining this variable in a labour market context, see Ross (2006).

results for the association between networks related to general social activities and participation illustrates that the extent of this association varies between remoteness and gender. Both females and males with access to networks related to general social activities are substantially more likely to be labour market participants than those who do not. The difference between those with access and those without is consistently larger for females than males, however the magnitudes vary according to remoteness. Examination of the results for mainstream employment and all of the social capital variables shows that the proportion can be relatively low. In most cases the proportion of individuals mainstream employed in regional areas does not exceed 30 percent.

**Table 1: Labour force outcomes by social capital proxies**

(a) Participation rates

		Average	Cultural		Social		Sporting	
			0	1	0	1	0	1
Major cities	Female	53.4	48.8	55.9	20.6	56.1	43.7	64.3
	Male	68.7	68.6	68.8	37.1	70.6	58.3	75.6
Inner regional	Female	48.7	46.3	50.4	22.5	52.1	38.3	63.1
	Male	69.4	72.6	66.3	53.3	71.5	62.6	75.4
Outer regional	Female	45.1	45.8	44.9	24.9	48.4	38.0	58.7
	Male	71.1	68.4	72.7	50.0	74.9	63.3	79.3
Remote & very remote	Female	51.6	49.5	51.9	35.8	50.9	44.6	61.4
	Male	71.1	65.4	72.0	53.6	73.3	63.6	76.3
(continued)		Average	Voluntary		Personal Support		Instit. Support	
			0	1	0	1	0	1
Major cities	Female	53.4	45.3	67.1	32.9	55.6	51.9	55.6
	Male	68.7	64.7	75.9	46.8	71.9	71.6	63.1
Inner regional	Female	48.7	43.4	65.2	29.9	50.7	47.7	50.6
	Male	69.4	59.5	77.5	55.4	71.8	71.3	63.9
Outer regional	Female	45.1	38.7	61.1	30.7	47.1	46.1	43.3
	Male	71.1	67.1	80.4	56.4	73.2	71.8	68.8
Remote & very remote	Female	51.6	46.8	74.8	42.0	53.3	52.5	49.9
	Male	71.1	66.8	90.0	71.9	70.9	71.4	70.3

(b) Mainstream employment

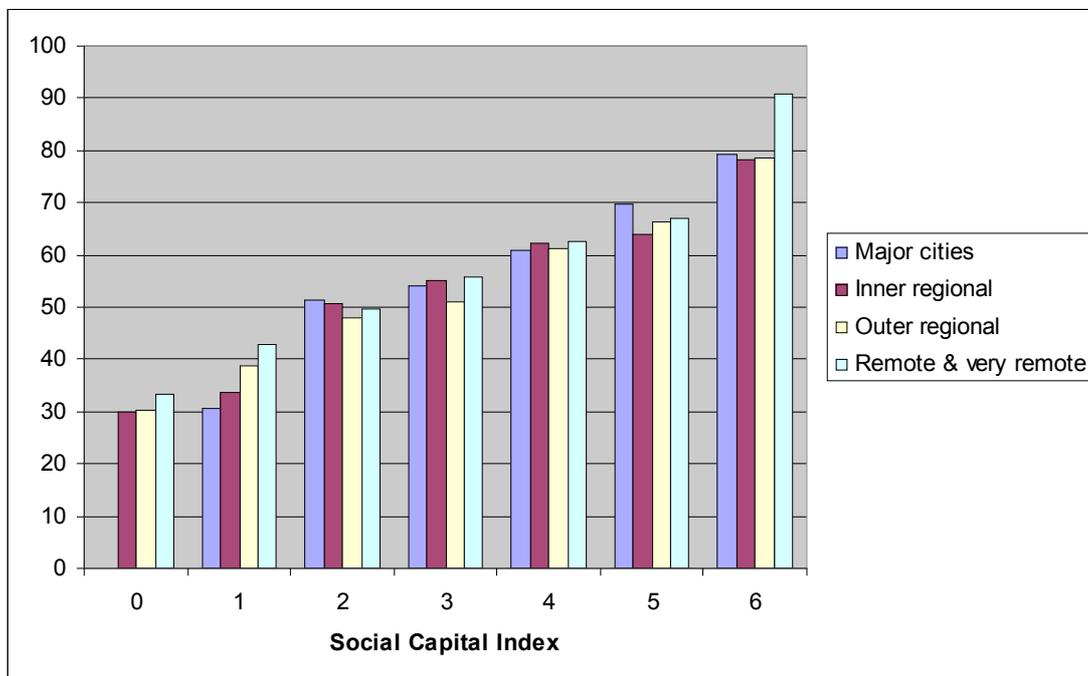
		Average	Cultural		Social		Sporting	
			0	1	0	1	0	1
Major cities	Female	40.3	36.2	42.6	14.3	42.5	30.5	51.4
	Male	49.6	54.0	46.4	25.7	51.1	38.3	57.1
Inner regional	Female	33.6	34.5	33.0	10.0	36.7	25.3	45.2
	Male	42.5	51.2	34.1	31.7	44.0	35.3	48.9
Outer regional	Female	30.3	32.6	29.3	11.6	33.2	23.7	42.7
	Male	40.0	50.3	34.0	19.1	43.7	32.0	48.4
Remote & very remote	Female	21.4	28.8	20.4	15.6	22.2	17.1	27.6
	Male	24.5	33.7	22.9	23.1	24.6	23.6	25.1
(continued)		Average	Voluntary		Personal Support		Instit. Support	
			0	1	0	1	0	1
Major cities	Female	40.3	32.1	54.4	11.0	43.6	38.9	42.4
	Male	49.6	43.9	59.9	32.5	52.1	51.7	45.6
Inner regional	Female	33.6	28.1	44.9	14.9	35.6	31.3	38.1
	Male	42.5	37.8	51.5	29.7	44.7	43.2	40.6
Outer regional	Female	30.3	24.7	44.0	15.3	32.3	30.1	30.6

	Male	40.0	33.2	55.8	31.8	41.2	38.8	43.9
Remote & very remote	Female	21.4	16.6	44.8	15.1	22.5	21.8	20.7
	Male	24.5	20.1	43.4	24.2	24.5	26.5	20.3

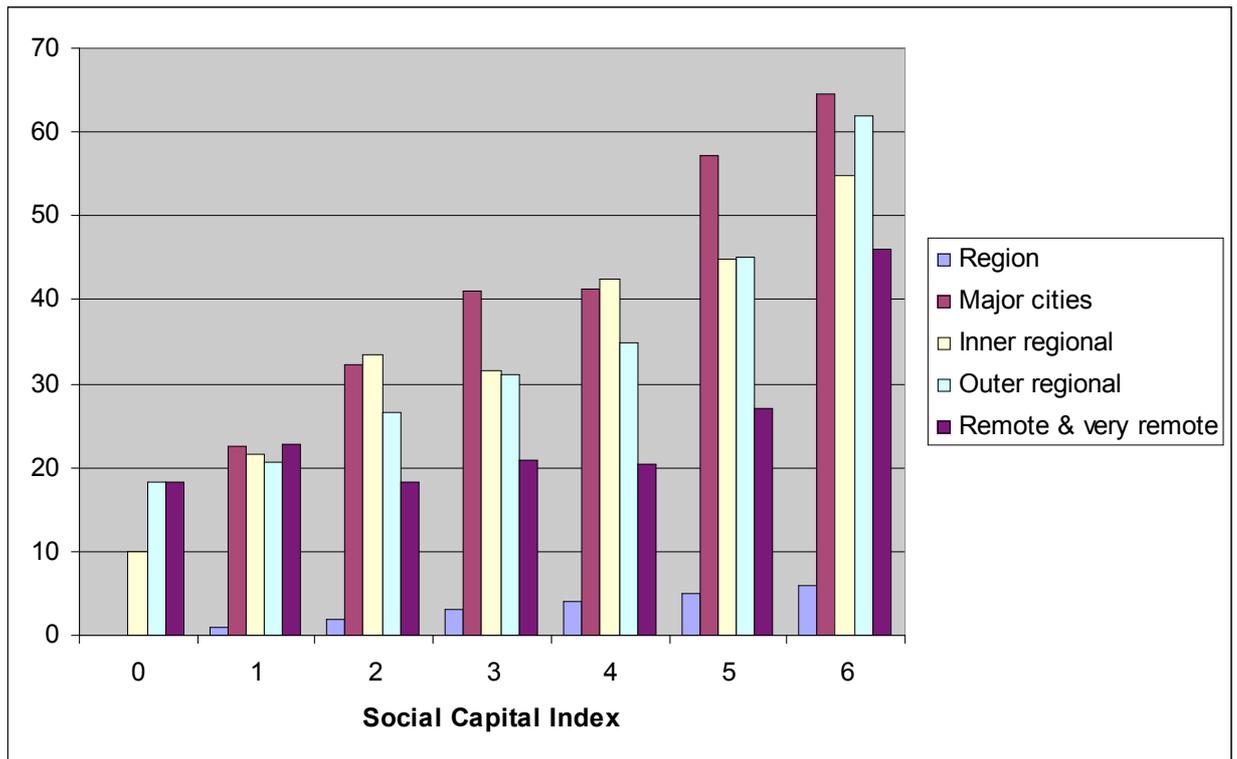
Source: 2002 NATSISS

Figures 2 and 3 deepen the insight provided by the tables by showing the relationship between labour market outcomes and the index of total networks, which measures both the quantity and diversity of social capital that an individual may access. While the previous observations evident in the individual proximal indicators of social capital hold, we can also see that as the diversity of social capital an individual may access increases so does the incidence of achieving participation and mainstream employment. While the effect varies according to remoteness and index value, the graphics illustrate a clear positive trend of association between the two variables.

**Figure 2: Participation rates by index of social capital and remoteness**



**Figure 3: Mainstream employment by index of social capital and remoteness**



## 5. MULTIVARIATE ANALYSIS

The modelling approach follows a theoretical view of employment outcomes being determined by a sequential process in which all individuals first make a choice regarding labour force participation, and only those who participate are able to obtain employment. The sample is restricted to working age respondents (aged 15 to 64) and the probability of participating in the labour force is modelled (Table 2). In the second set of models the sample is restricted to (working age) labour force participants and the probability of being in mainstream employment, as opposed to being unemployed, is estimated. CDEP participants are therefore also removed from the sample along with non-participants in line with a competing risks framework. This focus on mainstream employment is adopted because of a current policy mindset that mainstream employment should be the primary goal for Indigenous people. Previous modelling of broader employment outcomes, defined to include both mainstream employment and participation in a CDEP project, produces similar results with respect to the impact of social capital variables on the likelihood of an individual being employed as opposed to unemployed (Vurens van Es 2007).

As the dependent variables for both sets of models - participation and mainstream employment status – are binary outcome variables, standard logit models are used. Models were initially estimated separately by sex and by the four ASGC remoteness classifications. There are only minor differences in the results for very remote/remote and outer regional areas; and for major cities and inner regional areas (Vurens van Es 2007). In the interests of parsimony we therefore proceed using an urban versus regional dichotomy to capture the geographical context of social capital.

### *5.1 Participation*

The results for the participation models are reported in Table 2. Models 2.1 and 2.3 include the proximal indicators for access to individual dimensions of social capital, and models 2.2 and 2.4 include instead the composite indices of social capital. Labour force participation rates are markedly lower for females living in urban areas than for females living in regional areas, but there is no significant difference in participation rates for males between urban and regional areas. The coefficients on the human capital and demographic controls are largely as expected and in line with previous work. The coefficients for the human capital variables indicate that education and health are important factors in the labour force participation of Indigenous Australians. Educational attainment has a positive effect on the likelihood of participation for both males and females. While causality cannot be claimed, it is clear that self assessed health status is also positively related to the likelihood of participation.<sup>20</sup> When compared to the control group who rated their health as “very good or excellent”, the results indicate that participation decreases with self-assessed health status. Having a health disability has an additional negative impact on participation.

Married persons have higher rates of labour force participation. Participation is curtailed as the number of dependants in the household increases, and the effect is much stronger for females. No affect of having difficulty communicating with services providers or of mobility is identified. Having used a computer (other than at work) has a significant and positive affect for females, but no significant affect for males. Having been incarcerated in the year prior to the survey has the anticipated negative effect on participation, but the estimates are not significantly different to zero.

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<sup>20</sup> For a discussion of causality with respect to self assessed health status and Indigenous labour market outcomes see Ross (2006).

**Table 2: Labour force participation: logit model estimates, persons aged 15-64**

Variable	Females				Males		
	Model 2.1		Model 2.2		Model 2.3	Model 2.4	
Intercept	-0.75	***	-0.64	***	0.07	0.10	
Urban	-0.74	**	-0.51	**	-0.30	0.25	
<i>Region-social interaction terms:</i>							
Urban & has cultural networks	0.09				-0.36	**	
Urban & has social networks	0.75	***			0.51	*	
Urban & has sporting networks	0.46	***			0.26		
Urban & voluntary org networks	0.34	***			0.48	***	
Urban & has personal support	0.34	*			0.65	***	
Urban & has institutional support	0.03				-0.60	***	
Regional & has cultural networks	0.04				0.07		
Regional & has social networks	0.49	***			0.43	***	
Regional & has sporting networks	0.36	***			0.20	*	
Regional & voluntary org networks	0.50	***			0.87	***	
Regional & has personal support	0.25	**			0.08		
Regional & has institutional support	-0.30	***			-0.29	**	
Urban x social capital index			0.28	***		0.08	
Regional x social capital index			0.20	***		0.18	***
<i>Education – highest level achieved:</i>							
Year 9 or less	—		—		—	—	
Year 10 or 11	0.41	***	0.44	***	0.74	***	
Year 12 or Cert I/II	0.63	***	0.67	***	0.99	***	
Certificate III/IV	1.09	***	1.16	***	1.27	***	
Diploma/Advanced Diploma	1.31	***	1.35	***	0.63	*	
Bachelor's degree or higher	1.77	***	1.83	***	1.45	***	
Aged 15 to 19	-0.11		-0.03		-0.72	***	
Aged 20 to 24	-0.16		-0.13		0.20		
Aged 25 to 34	—		—		—	—	
Aged 35 to 44	0.35	***	0.35	***	0.05		
Aged 45 to 54	0.15		0.13		-0.10		
Aged 55 to 59	-0.26		-0.30	*	-0.46	**	
Aged 60 to 64	-1.40	***	-1.32	***	-1.62	***	
Married	0.26	***	0.27	***	0.95	***	
No. dependants in h-hold	-0.21	***	-0.21	***	-0.09	***	
Has a communication disability	-0.01		-0.03		-0.07		
No. dwellings lived in (past 12 mths)	-0.03		-0.05		0.04		
Used computer in past 12 months	0.41	***	0.48	***	-0.01		
<i>Self assessed health status:</i>							
very good or excellent	—		—		—	—	
Good	-0.21	***	-0.20	***	0.02		
Fair	-0.44	***	-0.47	***	-0.46	***	
Poor	-1.31	***	-1.36	***	-1.74	***	
Has health disability	-0.27	***	-0.31	***	-0.66	***	
Incarcerated in past 12 months	-0.11		-0.19		-0.13		
Observations	4998		4998		3749	3749	
Likelihood ratio (p>chi-sq)	<.0001		<.0001		<.0001	<.0001	
Percent concordant	75.0		74.2		80.0	78.8	
Somer's D	0.503		0.487		0.602	0.578	

Source: 2002 NATSISS; \*\*\*, \*\* and \* denote significance at the 1%, 5% and 10% levels respectively.

Focusing on the variables of primary interest, those for social capital, the results for the individual proximal indicators suggest that social capital may have significant

explanatory power with respect to labour market participation. Notwithstanding potential problems of measurement and joint endogeneity, which limit the claims that may be made regarding causality, there are a number of estimated coefficients which are significant and merit discussion.

To aid in the interpretation of the coefficients, Table 3 presents the marginal effects, which should be interpreted as the effect of a one unit increase in the variable on the likelihood of an individual participating in the labour force. Taking as an example the first row of Table 3, females living in urban areas and with access to cultural networks are estimated to be 9.8 percent more likely to be participating in the labour force than urban females who do not have access to cultural networks, though in this case we cannot reject the null hypothesis that the effect is zero. For urban Indigenous males, the estimated probability of participating in the labour forces is 30.6 percent lower for those accessing cultural networks than those who did not, significant at the five percent level. For the indices of social capital networks, the figures indicate the effect, evaluated at the mean, of an increase by one unit, remembering that the variables potentially range from zero to six.

In surveying the results, it is clear that the estimated effect of access to networks related to Indigenous culture is generally not significant in terms of participation. However, it is highly significant and negative for urban males. This indicates that while social capital related to Indigenous culture has little effect on the participation of most individuals, it may represent a form of asocial capital for the labour market participation of males in Inner Australia.

In contrast, it appears that social capital related to general social activities may have explanatory power with regard to labour market participation. Access to networks related to general social activities is significant for all groups. The coefficient is positive and significant for females in Inner Australia and is positive and highly significant for both genders in Remote Australia.

Similarly, the results for access to networks related to sporting organisations indicate that social capital related to sporting organisations may have explanatory power in participation, however primarily for females. Irrespective of remoteness, the coefficient for sporting networks is significant and positive for the participation of females, thus females who have access to networks related to sporting organisations are significantly more likely to participate in the labour market. For males, access to networks related to sporting organisations is significant in regional areas.

The coefficients for access to networks related to volunteer organisations are positive and significant irrespective of gender or remoteness. Indigenous Australians who have access to networks related to volunteer organisations are significantly more likely to participate in the labour market. This provides a strong indication that social capital related to volunteer organisations may create positive externalities that influence the likelihood of participation.

The results also indicate that support networks in times of crisis have a significant bearing. For males, the coefficients indicate that access to personal support networks has a positive and significant effect on the likelihood of participation in urban areas but not in regional labour markets. For females, access to personal support is significant at both levels of remoteness. Notably, the coefficients for institutional support networks are significant and negative for all groups except females in urban Australia. This may indicate that personal support networks are generally a form of social capital, whereas institutional support networks are asocial capital in terms of labour market participation.

When combined into the index of total networks, the coefficients are positive and highly significant in all cases except for males in urban regions. This indicates that the aggregate impact of an increase in total social capital, is an increase in participation. Moreover, the estimated coefficients imply a very large impact — a one unit increase in the social capital index is associated with an increase in the likelihood of participating in the labour market of between 20 and 30 percent.

**Table 3: Participation – percentage change effect on the probability of participating**

	Females	Males
Urban & has cultural networks	9.8	-30.6 **
Urban & has social networks	112.7 ***	66.6 *
Urban & has sporting networks	58.7 ***	29.8
Urban & voluntary org networks	40.8 ***	61.3 ***
Urban & has personal support	40.7 *	91.0 ***
Urban & has institutional support	2.7	-45.0 ***
Regional & has cultural networks	4.1	7.1
Regional & has social networks	62.5 ***	54.4 ***
Regional & has sporting networks	43.8 ***	21.9 *
Regional & voluntary org networks	65.0 ***	139.3 ***
Regional & has personal support	29.0 **	8.0
Regional & has institutional support	-26.1 ***	-24.8 **
Urban x social capital index	31.9 ***	7.8
Regional x social capital index	22.1 ***	20.2 ***
Actual participation rate (sample)	49.5%	70.5%

Source: 2002 NATSISS; \*\*\*, \*\* and \* denote significance at the 1%, 5% and 10% levels respectively.

### 5.2 Mainstream employment

The results for the participation models are reported in Table 4. Models 4.1 and 4.3 include the proximal indicators for access to individual dimensions of social capital, and models 4.2 and 4.4 include instead the composite indices of social capital. The coefficients on the human capital, demographic controls and other variables are generally as expected and are broadly in line with the model for participation. The human capital variables regarding education and health indicate that health and education levels have a positive impact on the ability to secure mainstream employment. In terms of demographics, married individuals are significantly more

likely to secure mainstream employment, however the likelihood of mainstream employment decreases as mobility and the number of dependents in the household increases. Use of a computer in the previous 12 months does not appear to have a significant impact on the likelihood of obtaining mainstream employment.

**Table 4: Mainstream employment: logit model estimates, non-CDEP labour force participants persons aged 15-64**

Variable	Females				Males			
	Model 4.1		Model 4.2		Model 4.3		Model 4.4	
Intercept	0.83	*	1.11	***	0.69	*	0.38	
Urban	-0.89		-0.70	*	-0.15		0.23	
<i>Region-social interaction terms:</i>								
Urban & has cultural networks	-0.22				-0.47	**		
Urban & has social networks	0.01				-0.24			
Urban & has sporting networks	0.49	**			0.54	**		
Urban & voluntary org networks	0.38	*			0.23			
Urban & has personal support	1.35	***			0.46			
Urban & has institutional support	0.42	*			-0.07			
Regional & has cultural networks	-0.08				-0.69	***		
Regional & has social networks	0.72	**			0.54	**		
Regional & has sporting networks	0.48	***			0.26			
Regional & voluntary org networks	0.16				0.56	***		
Regional & has personal support	0.08				-0.33			
Regional & has institutional support	-0.52	***			0.12			
Urban x social capital index			0.29	***			0.06	
Regional x social capital index			0.11	*			0.10	*
<i>Education – highest level achieved:</i>								
Year 9 or less	—		—		—		—	
Year 10 or 11	0.44	***	0.47	***	0.56	***	0.55	***
Year 12 or Cert I/II	0.88	***	0.93	***	0.68	***	0.69	***
Certificate III/IV	1.44	***	1.42	***	1.21	***	1.22	***
Diploma/Advanced Diploma	1.58	***	1.52	***	0.96	*	1.05	**
Bachelor's degree or higher	1.88	***	1.92	***	1.13	***	1.10	***
Aged 15 to 19	-0.79	***	-0.69	***	-0.69	***	-0.58	***
Aged 20 to 24	-0.33		-0.29		-0.03		-0.01	
Aged 25 to 34	—		—		—		—	
Aged 35 to 44	0.67	***	0.61	***	0.18		0.11	
Aged 45 to 54	0.98	***	0.90	***	1.08	***	0.98	***
Aged 55 to 59	15.63		15.53		0.87	**	0.76	**
Aged 60 to 64	2.15	**	1.98	*	2.09	**	2.14	**
Married	0.65	***	0.70	***	0.70	***	0.73	***
No. dependants in h-hold	-0.10	**	-0.11	***	-0.12	***	-0.13	***
Has a communication disability	-0.69	***	-0.66	***	-0.65	***	-0.72	***
No. dwellings lived in (past 12 mths)	-0.59	***	-0.58	***	-0.25	***	-0.28	***
Used computer in past 12 months	0.01		0.10		0.05		0.16	
<i>Self assessed health status:</i>								
very good or excellent	—		—		—		—	
Good	-0.27	*	-0.27	*	-0.07		-0.09	
Fair	-0.82	***	-0.85	***	-0.46	**	-0.49	***
Poor	-0.68		-0.77	*	-0.36		-0.49	
Has health disability	-0.22		-0.28	*	-0.13		-0.12	
Incarcerated in past 12 months	-1.21	***	-1.24	***	-1.45	***	-1.49	***

Observations	1857	1857	1854	1854
Likelihood ratio (p>chi-sq)	<.0001	<.0001	<.0001	<.0001
Percent concordant	82.6	81.4	78.9	77.2
Somer's D	0.655	0.63	0.579	0.547

Source: 2002 NATSISS; \*\*\*, \*\* and \* denote significance at the 1%, 5% and 10% levels respectively.

As for participation, the results for the proximal indicators of social capital suggest that social capital may play an important role in the labour market outcomes of Indigenous Australians. The estimation coefficients are provided in Table 4 and, for ease of interpretation, the corresponding figures that indicate the marginal effects of a change in social capital are presented in Table 5.

From models 4.1 and 4.2 we can see that similar to the results for participation, it appears that for males, networks related to Indigenous culture remains a form of asocial capital in terms of obtaining mainstream employment. Urban and regional males whose social networks extend to traditional Indigenous culture are 37.3 percent and 49.9 percent less likely to be mainstream employed that their counterparts who do not have networks related to traditional Indigenous culture. For females this relationship does not hold. Networks related to Indigenous culture do not have a significant effect on mainstream employment.

For networks related to general social activities, the results indicate positive externalities for the ability to secure mainstream employment. Social structure built around general social activities appears to be a form of social capital for males and females in regional for both genders. Individuals with network related to general social activities are over 70 percent more likely to be mainstream employed than those who do not. In contrast, the coefficients for general social activities are not significant for either gender in urban areas.

The estimated coefficients for sporting networks are significant for all groups aside from males in regional areas. This suggests that the social structures built on sporting organisations and activities may create important externalities that increase the ability of individuals to obtain mainstream employment. For example, women whose social sphere extends to sporting networks are 62 percent more likely to be employed in both regional and urban locations.

In contrast to the previous variables, the significance of voluntary networks is substantially reduced for the outcome of mainstream employment as compared to the results for participation. Networks related to voluntary activities remain significant for regional males and urban females, but are no longer significant for all four contextual groupings. For those groups that the coefficients are still significant the effect remains positive, indicating that voluntary networks are a form of social capital with respect to the ability to secure mainstream employment.

In terms of support networks, the results indicate that the effects are stronger for females that they are for males. The significant support networks for participation fall away completely for males as neither personal or institutional networks are significant

in regional or urban Australia. However, for females the importance of support networks remains. Personal support networks are significant and the effect is large for females in urban Australia. This implies that mainstream employment outcomes are very low for Indigenous females living in urban Australia without personal support. For institutional support networks, the coefficients become positive and significant in urban Australia, but are significant and negative in regional Australia.

Finally, the results of model 4.2 and 4.4 utilising the index of total networks indicate that in general, an increase in social capital has a positive effect on mainstream employment. The index is positive and significant for all but urban males. The mainstream employment outcomes of urban females are the most sensitive to an increase in the social capital available to the individual.

**Table 5: Participation – percentage change effect on the probability of being in mainstream employment**

	Females	Males
Urban & has cultural networks	-19.6	-37.3 **
Urban & has social networks	1.2	-21.4
Urban & has sporting networks	62.6 **	70.8 **
Urban & voluntary org networks	45.9 *	25.8
Urban & has personal support	284.7 ***	58.5
Urban & has institutional support	52.3 *	-7.2
Regional & has cultural networks	-7.4	-49.9 ***
Regional & has social networks	106.5 **	70.9 **
Regional & has sporting networks	62.3 ***	30.1
Regional & voluntary org networks	17.7	75.3 ***
Regional & has personal support	8.0	-27.8
Regional & has institutional support	-40.5 ***	13.0
Urban x social capital index	34.1 ***	6.6
Regional x social capital index	12.2 *	10.5 *
Actual mainstream emp. rate (sample)	76.8%	70.7%

Source: 2002 NATSISS; \*\*\*, \*\* and \* denote significance at the 1%, 5% and 10% levels respectively.

## 6. DISCUSSION AND IMPLICATIONS

While the results were complex, the essence of the findings can be distilled into Table 6 which presents the sign of those social capital indicators which were significant, at 10 percent, five percent or one percent, for participation and for mainstream employment. Inspection of both reveals that the results provide substantial support for the three hypotheses set out in Section 3.4 above.

Hypothesis one stated that; the quantity of social capital which an individual may utilise is positively related to labour market outcomes. In general, the results for the index of total networks, arguably the best indicator, provide strong support for hypothesis one. When the interrelated effects of different social spheres are measured together in the index, it appears that individuals who are able to access a large quantity

of social capital are more likely to participate in the labour market. For females, the probability of obtaining mainstream employment is also increased.

The results for networks related to general social activities, sporting organisations, volunteer organisations and to a lesser extent, personal support networks are also supportive. The results for these variables indicate that access to social capital related to each of these social spheres, in isolation, may increase the likelihood of participation or the probability of obtaining mainstream employment.

In contrast, the results for institutional support networks and networks related to Indigenous culture do not support hypothesis one. They indicate that in some contexts, when the social capital an individual may access increases, into either of these social spheres, the isolated effect may be a reduction in labour market participation and the ability to obtain mainstream employment. Should this be the case, there is the possibility that they represent asocial or negative social capital in a labour market context.

Hypothesis two stated that; the diversity of the social capital, which an individual may utilise, is positively related to labour market outcomes. The results utilising the indices of social capital provide broad support. They indicated that increased diversity in the social capital an individual may access, has a positive effect on the likelihood an individual will enter the labour force, irrespective of context. In terms of mainstream employment, the results are less clear. For women in both urban and regional labour markets, and for males in regional labour market they indicate that social capital diversity is positively related to mainstream employment, however for men there is no relationship of significance.

The third hypothesis stated; the relationship between social capital and labour market outcomes varies according to the context of (a) geographic location and (b) gender. The results are generally supportive of this hypothesis. While there are many strong trends in the relationships, the only uniform relationships are for networks related to volunteer organisations and total networks, with respect to participation. Moreover, the results indicate that the effect of social capital differs at separate stages of labour market outcomes. Therefore, it appears the role of social capital in Indigenous labour market outcomes will vary according the context of geographic location, gender and the labour market outcome in question.

**Table 6: Statistically significant proximal indicators of social capital  
(coefficient signs)**

Indicator	Remoteness	Participation		Mainstream Employment	
		females	males	females	males
Networks related to Indigenous culture	Urban		-		-
	Regional				-
Networks related to general social activities	Urban	+	+		
	Regional	+	+	+	+
Networks related to sporting organisations	Urban	+		+	+
	Regional	+	+	+	
Networks related to volunteer organisations	Urban	+	+	+	
	Regional	+	+		+
Personal support networks	Urban	+	+	+	
	Regional	+			
Institutional support networks	Urban		-	+	
	Regional	-	-	-	
Total networks	Urban	+		+	
	Regional	+	+	+	+

*Source: 2002 NATSISS*

These findings suggest the nature of the externalities in the labour market are very closely aligned with a bonding, bridging and linking conceptualisation of social capital. The bonding, bridging and linking conceptualisation argues that access to both the resources to “get by”, considered bonding social capital, and the resources to “get ahead”, known as bridging and linking social capital, are both important factors in enabling individuals to obtain labour market outcomes. Assuming it is more likely that individuals with large and diverse social networks would have access to both, under a bonding bridging and linking conceptualisation of social capital in the labour market, total networks should be positively associated with labour market outcomes. In line with this, the findings with respect to the indices of social capital indicate that individuals with diverse and large social networks are generally more likely to participate and secure meaningful employment in the labour market.

Embedded within this first point regarding the importance of bonding, bridging and linking social capital for obtaining labour market outcomes, is the suggestion that different social spheres serve different purposes. Therefore, we would expect that, the relationship between individual proximal indicators of social capital and labour market outcomes will vary. This is evident in the findings, which suggest in isolation different components of an individual’s social structure have different roles in Indigenous labour market outcomes.

Personal support networks and networks related to Indigenous culture may represent bonding social capital. The results for personal support networks, which have a widespread affect on participation and to a lesser extent, mainstream employment, may indicate the importance of bonding social capital as a foundation for “getting by” and allowing an individual to enter in the labour force. However, the inconclusive and at times negative results for networks related to Indigenous culture (primarily for men who are seeking mainstream employment) may show the negative side of bonding,

which in isolation, or the absence of bridging and linking social capital, may exclude or hinder an individual from achieving within mainstream labour markets.

While this finding, regarding networks related to Indigenous culture, may be controversial, it must be remembered that social capital related to Indigenous culture is reproduced because individuals value the direct outcomes that the act of reproduction generates. Therefore, any negative externalities with respect to the labour market need to be weighed against this consideration. Moreover, in some situations negative externalities, such as discriminatory workplace policies, are not self induced, but are imposed on Indigenous individuals. The socioeconomic structures, which make up the labour market, may contribute to the exclusion of Indigenous Australians whose social network extends to spheres related to Indigenous culture. The finding that cultural networks have a stronger negative impact on men may reflect that the traditional roles of women in Indigenous society are quite akin to those of women in Western society, whereas for men there is a stark contrast between the nature of economic activities and the social ‘rules of the game’.

Networks related to general social activities, sporting organisations, volunteer organisations and institutional support networks may be thought of as bridging and linking social capital. The generally positive relationship between these and labour market outcomes suggests that social capital in these spheres provides connections between diverse social structures and Indigenous Australians which aid in “getting ahead”. The results indicate that social capital in these spheres creates externalities, which augment the productivity (or perceptions) of, or the opportunities available to, the individual.

The mixed and at times negative relationship between institutional support networks and outcomes may have a number of interpretations. Assuming that institutional networks are a stop-gap measure for individuals in crisis without personal support networks, a negative relationship between institutional networks and participation may reflect that the individual is in crisis rather than an effect generated by contact with institutions of support. Interpreted in this manner, institutional support structures are linking social capital, which does not have major implications for labour market outcomes.

However, if the “stop-gap” assumption is removed, an alternate, albeit less likely outcome, is that links between individuals and institutions of support create externalities not beneficial for labour market outcomes. Under this interpretation, institutional support networks are a social linking capital in a labour market context. One example is the notion of welfare dependency. This line of reason contends that by providing support in times of crisis, institutions leave open the possibility that assisted individuals will become dependent on the organisation for resources after the initial crisis has passed. Therefore, the institution of support represents an alternative means to the labour market for obtaining material and non material needs. Some individuals, who have come into contact with the institution, will prefer it over the

labour market. Therefore, contact with the institution reduces probability of obtaining a labour market outcome.

### *6.1 Practical initiatives*

While one aim of this paper has been to explore the conceptualisation of social capital in the labour market and its possible application to facilitate a richer understanding of Indigenous Australians in the Australian labour market. An equally important objective is to offer practical policy implications for addressing Indigenous disadvantage. Social capital may prove a valuable tool in the decision making of Indigenous Australians looking to improve their labour market outcomes as well as the policy frameworks of Governments, business and Non Government Organisations (NGO) working towards increased Indigenous participation and employment.

#### 6.1.1 Indigenous Australians

For Indigenous Australians looking to improve their labour market outcomes, a number of important points can be made. Individuals may consider; (1) increasing the size and scope of their total networks; (2) investing in personal networks of support; (3) building networks related to general social activities, sporting organisations and volunteer organisations alongside investments made in networks related to Indigenous culture.

The results suggest individuals may look to extend their social sphere. They indicate that the total social capital an individual may access has positive effects on participation in all contexts and for females there are positive effects on the ability to obtain mainstream employment. It appears that increasing the size and diversity of an individual's social sphere may be an effective method for obtaining new skills and opportunities, overcoming discrimination and negative perceptions in the labour market and for establishing links which may aid in self employment.

The results also suggest individuals may also look to invest in personal support networks for times of crisis. They indicate that in some contexts, social capital related to personal support has important positive effects on labour market outcomes, however more broadly, it may help individuals to avoid institutional support networks. Regardless of whether it is a "stop-gap" measure or social capital in terms of the labour market, social capital related to institutional support is, in many cases, associated with decreased labour market performance.

Finally, while important for many other reasons, the results indicate social capital related to Indigenous culture is not beneficial in terms of the labour market. This is not to say that individuals should not invest in this type of capital, far from it. Many activities in society are done for their own intrinsic value irrespective of the externalities which they generate. The key is that in building social capital related to Indigenous culture, individuals who wish to participate and secure meaningful employment in the labour market should not neglect other social spheres. In particular, they may look to build relationships based around general social activities and community groups such as sporting and volunteer organisations. It appears that

these social spheres provide the bridging and linking social capital, which acts as a conduit to improved labour market outcomes.

#### 6.1.2 Government, business and non government organisations

When discussing social capital from a policy perspective, it is tempting to argue that organisations should look to build social capital, or destroy asocial capital, if it helps achieve outcomes beneficial for society. However, a policy approach based on creating or destroying social capital is fraught with difficulties. Social capital is created for the valued outcomes that flow directly from interactions between individuals. While it may be destroyed by policy, its creation must be driven by the individuals themselves. Moreover, the contextual nature of social capital means that it is often difficult to gauge the full range of the externalities it may create in any given place or time.

Despite the difficulty in building or destroying social capital, it is important that social capital is considered when formulating and implementing policy. The Productivity Commission has noted, “Whereas devising policies to create social capital generally is problematic, governments should at least consider the scope for modifying policies that are found to damage social capital, and ways of harnessing existing social capital to deliver programs more effectively” (PC 2003, p8).

Whilst directed at governments, this mantra applies more broadly. Decisions and policy implemented by business and NGOs are just as influential as those put in place by the public sector, and this will be especially so within regional and remote Indigenous communities. For those working towards increasing the rate of participation and employment of Indigenous Australians, the difficulty in building social capital indicates that policy, or initiatives, which aim to improve the labour market outcomes of Indigenous Australians through the creation of new social structures, may not be the simple answer. However, the results reported in this paper suggest that harnessing the existing stock of social capital could yield substantial benefits.

To harness social capital in the labour market, government, business and NGOs should understand that social capital is contextual in nature. Policy and decision-makers must consider the role of social capital in the context of region, gender and outcome being addressed. Doing so requires a rigorous Indigenous labour market policy framework, which both links together policy measures, outcomes and wider objectives and explicitly discusses the degree of integration between traditional Indigenous and non traditional social structures (Dockery & Milsom 2005). Without such a framework, policies may prove to be largely ineffective. The results imply, for example, that institutional support may be partially effective in promoting labour market outcomes in urban settings, but is a very poor replacement for personal support networks in regional settings, at least as it is currently delivered.

The results have also indicated that the quantity and diversity of total social capital an individual can access is important. This suggests that the effects of different social

spheres are intertwined. While in isolation, each social sphere may generate positive or negative externalities, it appears that in aggregate, the externalities of increased social capital diversity and quantity are positive or, at worst, neutral in terms of labour market outcomes.

Therefore, within a robust framework, government, business and NGO policies, which aim to harness social capital to improve labour market outcomes, should incorporate two simultaneous approaches. These are; (1) supporting community organisations/activities that have a record of sustained engagement with Indigenous Australians; (2) facilitating connections between established social capital and the other social spheres which an individual may engage in.

The rationale behind the first approach comes from social capital theory. Social capital is reproduced for the intrinsic value of the direct outcome and not the externalities which may occur.<sup>21</sup> Sustained engagement of Indigenous Australians with an organisation/activity indicates that those individuals have valued the outcomes generated. Therefore, given a fixed quantity of resources supporting that organisation/activity, as compared to others, is likely to yield the greatest return in terms of social capital. To a large extent, the social capital associated with that organisation/activity will be naturally reproduced.

The rationale for the second approach comes from the empirical results. The facilitation of connections between a supported organisation/activity and other organisations/activities may lead to bridges and links between social capital in one social sphere to social capital in other areas. Bridges and links aid individuals to build the quantity and diversity of the total social capital they may access. This research indicates that on aggregate, the externalities from increased quantities and diversity of social capital have a positive or at worst neutral impact on the performance of Indigenous Australians in the labour market.

This simultaneous policy approach has implications for the assessment of many organisations/activities. However, it has particularly important ramifications for the assessment of policy related to Indigenous cultural organisations/activities. While in isolation, networks related to Indigenous culture may be asocial capital in the labour market context, it must be considered whether social capital in this sphere is intertwined with, or may be connected to social capital in other spheres. If organisations/activities related to Indigenous culture have shown sustained engagement with Indigenous Australians, a simultaneous approach of support and facilitating connections with sporting, volunteer and general social organisations/activities may be valuable policy in terms of Indigenous labour market outcomes.

In facilitating links between organisations/activities related to Indigenous culture and those related to other purposes, it should be noted that connection is a “two way street”. Not only should Indigenous organisations/activities be linked to the broader

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<sup>21</sup> While the nature of the isolated externality, which stems from the initial organisation/activity, with respect to labour market outcomes is of concern, it should be part of a broader set of considerations.

community, the broader community must also assess how it may accommodate the requirements of Indigenous cultural structures. Similar to the arguments of Myrdal (1996,1944), issues of social exclusion must be approached from both sides with an understanding of the desired degree of integration between different social structures.

## **7. CONCLUSIONS**

This paper explores the role of social capital externalities in determining the labour market outcomes of Indigenous Australians by using the 2002 National Aboriginal and Torres Strait Islander Social Survey (NATSISS) to test the empirical link between social capital, operationalised through measures of network structure, and the labour market outcomes of Indigenous Australians. The results, which indicate that social capital externalities play an important role in the labour market outcomes of Indigenous Australians, augment emerging social capital theory by adding weight to the bridging, bonding and linking conceptualisation of social capital in the labour market and, from a practical standpoint, raise considerations for Indigenous Australians and organisations grappling with Indigenous labour market outcomes.

Focussing on labour force participation rates and mainstream employment as indicators of labour market outcomes, the analysis, from a network centric, structural-micro approach supports the hypotheses that;

- 1) The quantity of social capital which an individual may utilise is positively related to labour market outcomes.
- 2) The diversity of the social capital which an individual may utilise is positively related to labour market outcomes.
- 3) The relationship between social capital and labour market outcomes varies according to the context of (a) geographic location and (b) gender.

Yet, although these results show promise, it is clear that this work is exploratory. Social capital theory is still at a formative stage in terms of its conceptualisation and even more so with respect to its operationalisation in empirical work. In recognising this, the analysis presented identifies its limitations and follows the best practice of Stone (2001) by employing an empirical methodology closely aligned with a theoretical framework, which conceptualises social capital as a multidimensional resource to collective action where context is critical to the externalities created by those resources.

It should also be recognised that, the combined analysis of network variables and labour market outcomes raises the issue of joint endogeneity. For many individuals their social sphere and work life are closely intertwined. Even where there is correlation between the two variables, it is difficult to assess whether causality runs from network outcomes to the labour market or vice versa. Indeed, it may be that the relationship between social capital and labour market outcomes operates through a process of circular and cumulative causation rather than in one particular direction.

Despite the exploratory nature of this research, we believe that the use of social capital analysis provides unique insights into the performance of Indigenous Australians in mainstream labour markets that are not captured through more traditional techniques. Importantly, the method explicitly recognises both the role and value of culture, as embodied in networks in shaping outcomes. To date, policies to address Indigenous disadvantage have failed to come to terms with these contradictory effects of culture. It is hoped that further social capital research, which identifies both the structure and sentiment of social relationships accessed by Indigenous Australians, may contribute to finding a way forward from the current impasse.

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## APPENDIX

**Appendix Table A1: Variables definitions and means; Indigenous persons aged 15 to 64**

Variable	Definition <sup>a</sup>	Means
<i>Dependent Variables</i>		
Participation	Labour force status is employed or unemployed	0.59
Mainstream employment	Labour force status is employed and employment sector is not 'CDEP'	0.31
<i>Social Capital Variables</i>		
Has cultural networks	In the past 12 months has attended a cultural event (including a funeral, ceremony, sports carnival, festival/carnival involving arts, craft, music, or dance, or is involved with an Aboriginal/Torres Strait Islander organisation) or participated in a cultural event.	0.74
Has social networks	Has been involved in social activities in the last three months	0.89
Sporting Networks	Individual has participated in a sport/physical activity in past 12 months as a player or participant; coach, instructor or teacher, referee, umpire or official, committee member or administrator; or involved in some other capacity.	0.47
Voluntary organisations	types of organisation included by the 2002 NATSISS are diverse including arts, health, emergency services, welfare, religious and recreational.	0.26
Has personal support	In time of a crisis, would have personal support from friend, neighbour or family member	0.87
Has institutional support	In time of crisis, would have support from Community, charity or religious organisation; Local council or other government services; Health, legal or financial professional or 'other', but not including 'work colleague'	0.33
Social capital index	Sum of the above social capital variables	3.55
<i>Regional variables:</i>		
Urban	Lives in major city or inner regional Australia	0.29
Regional	Lives in outer regional, remote or very remote Australia	0.71
<i>Region-social interaction terms:</i>		
<i>Urban &amp;:</i>		
- has cultural networks		0.17
- has social networks		0.27
- has sporting networks		0.15
- voluntary org networks		0.10
- has personal support		0.26
- has institutional support		0.10
- x social capital index		1.06
<i>Regional &amp;:</i>		
- has cultural networks		0.56
- has social networks		0.62
- has sporting networks		0.32
- voluntary org networks		0.16
- has personal support		0.61
- has institutional support		0.22
- x social capital index		2.49
Male		0.43

*Education – highest level achieved:*

Year 9 or less	Highest level of schooling is year 9 or below or never attended school and has no non-school qualification	0.36
Year 10 or 11	Highest level of schooling is year 10 or 11 and has no non-school qualification;	0.36
Year 12 or Cert I/II	Highest level of schooling is year 12 and/or completed a Certificate level I or II, or Certificate 'not further defined'	0.14
Certificate III/IV	Obtained Certificate level III or IV	0.08
Diploma/Advanced Diploma	Obtained diploma or advanced diploma	0.03
Bachelor's degree or higher	Obtained bachelor's degree or postgraduate qualifications	0.03
Aged 15 to 19		0.15
Aged 20 to 24		0.13
Aged 25 to 34		0.27
Aged 35 to 44		0.23
Aged 45 to 54		0.15
Aged 55 to 59		0.05
Aged 60 to 64		0.03
Married	Social marital status is 'married' as opposed to 'not married'	0.50
No. dependants in h-hold	no. of dependents in household, discrete variable from 0 to 7+	1.83
Has a communication disability	Experiences difficulty understanding and/or being understood by service providers	0.13
No. dwellings lived in (past 12 mths)	no. of dwellings lived in over the past 12 months, discrete variable from 1 to 5, where 5 includes 5+	0.44
Used computer in past 12 months	Used a computer in the past 12 months and did not indicate had used computer at work	0.44
<i>Self assessed health status:</i>		
very good or excellent	Self-assessed health status is excellent	0.34
Good	self-assessed health status is good	0.15
Fair	self assessed health status is fair	0.06
Poor	self assessed health status is poor	0.36
Has health disability	Reports having a disability or long term health condition	1.40
Incarcerated in past 12 months	Has been incarcerated in the past 5 years	0.07

a. Unless otherwise status, variables are dummy variables with a value of one if the given criteria is met, and 0 otherwise.