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**Social Capital and Incentive Compatibility:
Modelling the Accumulation and Use of Social Collateral**

By

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**SOCIAL CAPITAL AND INCENTIVE COMPATIBILITY:
MODELLING THE ACCUMULATION AND USE OF SOCIAL COLLATERAL***

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Abstract: In economics, where the long resistance to reflecting on the effects of social interaction on economic behaviour is slowly waning, the concept of social capital may turn out to be a useful analytical tool. However, initial interest in social capital has produced a large variety of definitions, theoretical frameworks, empirical analyses, and even policy prescriptions. This paper provides a selective review and critique of some of the more recent literature on social capital. It then suggests that many of the problems in the existing literature can be addressed by lowering aspirations about what social capital is and reformulating it in terms of its impact on incentive problems in economic transactions in the presence of imperfect markets and costly or non-enforceable contracts. The paper finally advances a model of one of the ways that social capital resolves incentive compatibility problems, namely its role as a collateral asset.

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**SOCIAL CAPITAL AND INCENTIVE COMPATIBILITY:
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Pero sé que el dinero es un factor muy importante para sobrevivir, no?
Pero hay que ser bien responsable para pedir y para pagar, no puedes
pedir y después no pagar, lo único que nos ganamos es enemistades.
(I know that money is very important for survival, right? But one has to
be very responsible in asking for a loan and in paying it back – you can't
ask for a loan and then not pay it back. [In that case,] the only thing you
do is make enemies.)

Anonymous Food Vendor at Alameda Chabuca Granda, Lima
(quoted in Rames, in progress)

The fear of losing the respect and friendship of members of our social group is a powerful incentive. Indeed, the woman quoted above indicated that while her friends would be willing to lend her the money that she needed to improve her small enterprise, she did not want to accept the loan, fearful of the social consequences should she be unable to repay. Similar to survey respondents who will not apply for formal loans because they are fearful of losing their land or other collateral assets in event of default (see Boucher and Carter, 2001), this woman appears to be saying that she is afraid of losing what might be termed her social collateral.

This paper develops the notion of social capital as a collateralisable asset. Section 1 of the paper puts together a review of the literature on social capital, identifying a number of conceptual incongruities and weaknesses in the concept of social capital. Section 2 then argues that we can address many of those weaknesses if we reformulate social capital as features of social structure that relax the incentive compatibility constraint in economic transactions. While this reformulation is not so broad as to capture everything that travels under the social capital rubric, it does permit us to identify three dimensions: social capital as self-enforcing social rules or norms, as moral norms, and as social collateral. Section 3 of the paper then puts forward a formal economic model of social capital as collateral. The paper closes by noting ways in which this approach may help to resolve some of the problems with the social capital concept.

1. OVERVIEW AND CRITIQUE OF SELECTED ISSUES IN THE LITERATURE

1.1 Definition

Scholars who have sought to incorporate social structure in economic analysis of human behaviour have mostly done so acknowledging that development of theoretical frameworks for, and meaningful and empirically tractable measurement of, the concept of ‘social capital’ has not yet intellectually matured. While deploring the confusion over the meaning and definition of the term, they have offered their own definition consistent with their subsequent theoretical or empirical analysis of the role of social relations in the economic sphere. Indeed, the definitions offered are diverse and bring with them a disparate set of theoretical and policy implications. This paper will use a presentation of some of these attempts to conceptualise social capital as our point of departure for a discussion of the interface between the social and economic realms.

James Coleman’s (1988) early study on the role social capital plays in fostering human capital is considered by many to be a seminal work in terms of its contribution to analysis of this topic. According to Coleman, social capital is comprised of “a variety of entities with two elements in common: they all consist of some aspect of social structures, and they facilitate certain actions of actors within the structure”. Inherent in this definition is the focus on social capital as owned by ‘actors’ rather than larger entities such as communities or societies, and the emphasis on the function of the social structures that are embodied in social capital. Throughout his study, Coleman refers to commonalities as well as contrasts with physical and human capital as a way to elucidate his definition and expose social capital’s role in education.

Alejandro Portes (1998) presents in some detail the conceptualisations of social capital by Bourdieu (1985), Loury (1977), and Coleman (1988) and evaluates these definitions, and then concludes that the most agreeable definition is one which sees social capital as “the ability of

actors to secure benefits by virtue of membership in social networks or other social structures”. Portes’ main concern with Coleman’s — and as we later show, Putnam’s — expositions is that both lend themselves to confusion between social capital, its sources, and its effects, and that the latter in addition delivers an extension of the meaning beyond individuals to communities and nations, which brings with it the danger of making tautological statements about the positive outcomes of social capital.

Woolcock and Narayan (2000) offer a simple definition of social capital when they write that it refers to “the norms and networks that enable people to act collectively”. Since they focus on the community as the unit of analysis, their approach to understanding social capital also stands in contrast to Portes’ approach.

In a suggestively titled paper (‘The Case “Against” Social Capital’, 1999), Steven Durlauf finds that viewing social capital as “the influence which the characteristics and behaviours of one’s reference groups have on one’s assessments of alternative courses of behaviour” circumvents the problematic nature of many definitions that already carry within them the alleged good outcomes of social capital. Like in Portes (1998), there is also here a concern that there is a potential problem of making empty statements if social capital is defined in a way that the presence of positive outcomes is an indicator that social capital was at work.

Others have expressed the need to find a different term altogether. For example, maintaining that social capital is a poor term for the idea it is supposed to represent, Samuel Bowles (1999a) proposes the usage of a new one: community governance. Bowles holds that social capital is a misnomer, since ‘capital’ refers to a thing possessed by individuals, whereas the attributes that make up social capital, such as trust, commitment to others, adhering to social norms, etc., describe relationships *among* people. In contrast, ‘community’ “better captures the

aspects of good governance that explain social capital's popularity, as it focuses attention on what *groups do* rather than what *individuals have*" (emphasis original).

A similar terminological critique is delivered by Solow (2000), who doubts that social capital has any of the key attributes of capital: a stock of produced or natural factors of production that can be expected to yield productive services for some time; a cumulation of past flows of investment, with past flows of depreciation netted out; etc. Like Bowles, Solow offers an alternative term, 'behaviour patterns', that is meant to avoid drawing a false analogy with capital.

1.2 The costs of sociality: Externalities, constraints, and opportunity costs

There seem to be two tendencies in the literature as regards the discussion of 'negative' social capital. Much of the literature — especially empirical work, usually preoccupied with trying to ascertain the significance of positive economic outcomes of social capital — does not give any or sufficient attention to the possibility that social capital can also have deleterious effects. On the other hand, that part of the literature which does pay attention to this question often does not adequately sort out the conceptually distinct types of negative effects, e.g. negative externalities of social capital in a social group that befall non-members of the group vs. social capital in a group that might harm members, etc. In this section we explore the pathways by which social connections can negatively affect individuals, which players will be so affected, and what types of social relationships might lead to undesirable consequences.

It is in the nature of certain kinds of bonds between people that these bonds derive not only from common traits and shared experience of the members of the group, but also from strong differentiation from non-members. Intra-group cohesiveness is often associated with, but does not necessarily have to imply, inter-group hostility. Ethnicity as a common trait and source

of shared experience is a classic case of this phenomenon. Waldinger (1995) describes how ethnic groups end up dominating certain sectors of the New York economy and how they reproduce their dominance through hiring practices that reflect the information and stock of trust built up within their ethnic community. Here, the erection of strong social ties that constitute a group's social capital comes at a cost to outsiders who do not exert control over the production of this social capital. In this sense, social capital can produce negative externalities to those that do not own it.

But costs are not always limited to those who are not part of the networks. Coleman (1988) identifies three forms of social capital: reciprocity relationships (which he calls obligation and expectation), information channels, and norms and effective sanctions. It is particularly this third form that, by creating "enforceable" norms of behaviour which serve the interest of the collectivity, also constrains individuals in their freedom.

One could probe somewhat deeper into this idea and ask whether the persons within the social structure that forms the sphere of the norms are necessarily always constrained. After all, since norms are distinct from formal laws (e.g. the law that one must always stop at a stop sign) which might only be obeyed for fear of punishment, norms have usually been internalised by the persons subjected to them. But if a norm has been internalised in such a way, it may be disobedience rather than obedience that would cause disutility. We would like to return to this objection later, as it holds an important issue that merits separate discussion.

Another critical point to be aware of, especially when attempting to empirically assess the benefits accruing from the production of social capital, is the possible existence of opportunity costs. For example, Durlauf aptly criticises Putnam's conclusion that the decline of Parent Teacher Association (PTA) memberships presents a loss to society, as Putnam fails to consider

the likely reason for that, namely the increase in mothers' labour force participation. So the maintenance of social capital in the form of PTAs might have come at the price of limiting opportunities to participate in the working world. Answering the question whether there is a net loss to society must then take the increased employment options for mothers into consideration.

1.3 Endogeneity of social capital

Capital goods are those inputs to production that are themselves produced. Social capital shares this characteristic with conventional forms of capital. Yet, another area which empirical research has come short on is the examination of the forces which help create and strengthen social capital. Usually, while social capital as a variable is itself intellectually dissected for greater insight into its workings, it is often taken as 'externally' given.

Narayan and Pritchett (1999), Maluccio, Haddad and May (2000), and Grootaert (1999) for example use data from Tanzania, South Africa, and Indonesia respectively to determine how social capital, measured by household memberships in groups, affects household expenditures. The first two works do control for possible endogeneity of social capital in the narrower sense that they control for the possibility that a household's membership in groups is in turn influenced by expenditures. However, these and other empirical studies fail to account for the ways in which the household's social capital is created, and how a household's contribution to social capital is enforced or limited by that of other households. To use Granovetter's words, "culture is not a once-and-for-all influence but an ongoing process, continuously constructed and reconstructed during interaction. It not only shapes its members, but also is shaped by them, in part for their own strategic reasons." (1985, p.486).

Certainly this is not only a problem of undeveloped models, but also of measurement, since most studies use univariate or very limited measures of social capital that might constrain

the depth of analysis that can be undertaken. The need to shed better light on the determinants of social capital does not merely spring from intellectual curiosity but emerges if research is to be relevant for policy making. For governments or other institutions to foster the generation of social capital, it is imperative to have a good handle on how it comes about.

1.4 Some perspectives on the owners and beneficiaries of social capital

An aspect of the conceptualisation of social capital over which there are significant differences in the literature is the unit of analysis. In most of the theoretical and empirical work, the entity that is said to have social capital is the actor, i.e. the individual or household. Coleman (1988), Portes (1998), and Bourdieu (1985), to name just a few examples, frame their discussion in the context of individual “ownership” of social capital. In some other writings, the bearer of social capital is the community, or even society or nation. However, some studies also change their unit of analysis from individual to society/community as needed for the point to be made.

One interesting example of the latter is the previously cited study of Narayan and Pritchett (NP) (1999). NP, defining social capital simply as “the quantity and quality of associational life and the related social norms”, state that the focus of their study is on the way social capital affects communal life, in this case the welfare of rural Tanzanian villages. Practically, community social capital is measured by the number and characteristics of groups existent in the village. However, in the data analysis, the economic effect of household social capital is also investigated. Both household-level and village-level social capital indices are also used to measure the economic welfare of the household.

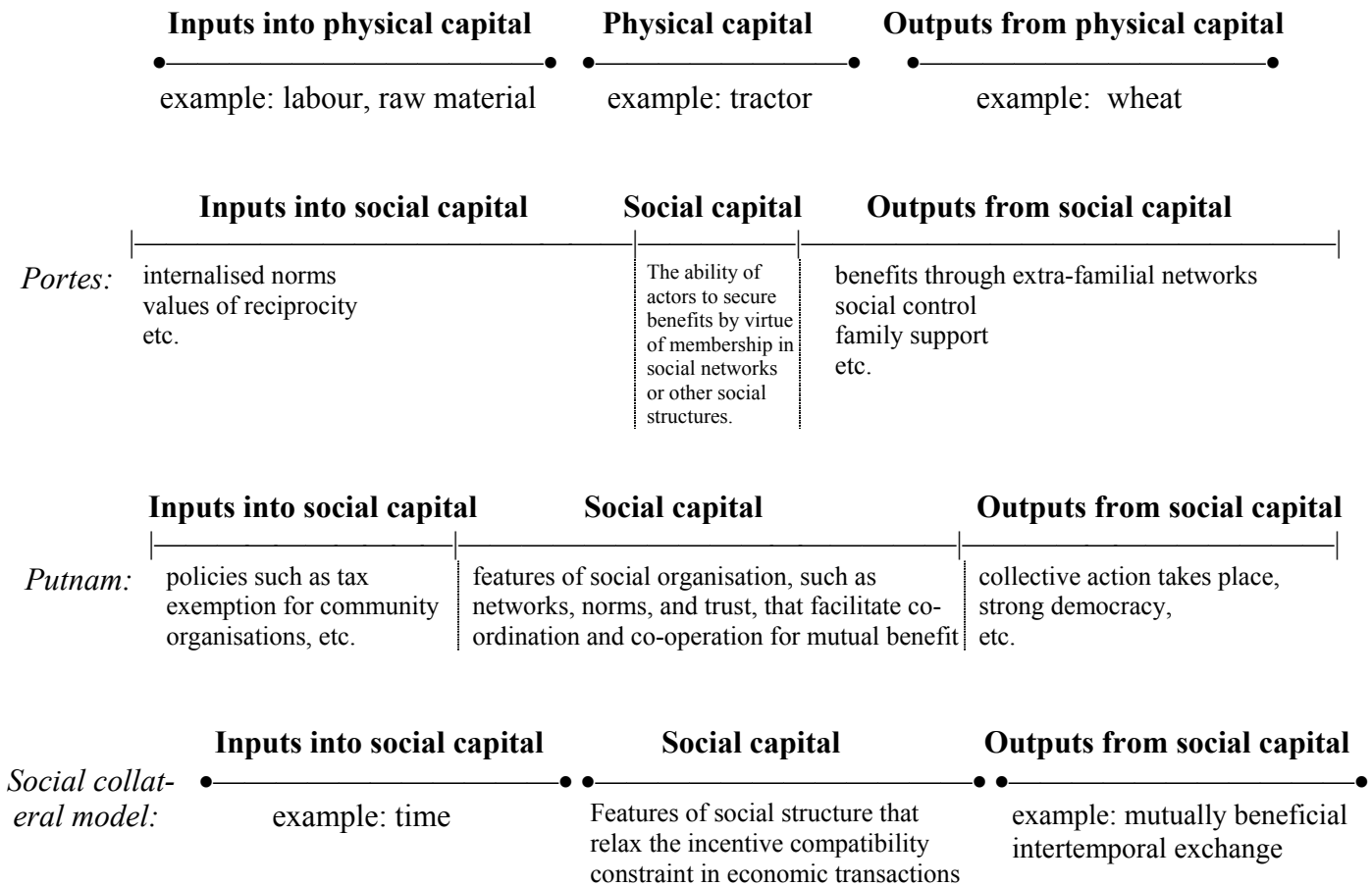
NP are also somewhat inconsistent in their notion of what makes social capital “social”. Initially, they refer to this form of capital as being social because, unlike other forms of capital, it is embodied in the social relations and associations within the community. Later in the study,

they seek to expose the social attribute by showing how, if someone has social capital, this comes to the benefit of *other* households as well. That is, they equate the ‘socialness’ of social capital with its public good character, or more generally, its ability to generate (positive) externalities. It ought to be emphasised that the problem here is the inconsistency in the description of what makes social capital social, and not the conceptualisation of social capital as (at least partially) a public good. Indeed, many scholars have argued this case, including most of those mentioned previously.

One who has argued otherwise is Fukuyama (1999). He asserts that Coleman’s description of social capital as a public good “is clearly wrong” (p.1). According to him, social capital is produced as a private good, given that its accumulation requires the co-operation of all who will partake in the social relations, and given that all will stand to benefit. If there is an argument against social capital being a public good, it is certainly not that of Fukuyama. After all, one can easily conceive of a case in which the incremental effort one individual in a social group makes toward building trust and reciprocity increases the social capital in the group, from which the individual benefits, but other members as well, and that the individual cannot practically prevent others in the group from benefiting from the increased presence of trust. In such a case, social capital is indeed a public good, as it is non-rival and non-excludable.

Like NP, Putnam (1993, 2000) offers another example of a view of social capital theory through the macro-lens. Here, it is primarily understood to be a property of societies and nations, and heavy emphasis is placed on civic engagement as an indicator of social capital, even though his definition of social capital as “features of social organisation, such as networks, norms, and trust, that facilitate co-ordination and co-operation for mutual benefit” (1993) does not immediately expose his stress on the civic realm.

FIGURE 1: THE ‘SOCIAL PRODUCTION SPECTRUM’



1.5 Generators and consequences of social capital along a ‘social production continuum’

A consequence of the lack of widespread consensus on a precise conceptualisation is the disagreement on where the lines ought to be drawn between (i) the sources/generators of social capital, (ii) social capital itself, and (iii) the effects of social capital — or to put it more mechanically, between the inputs, the properties, and the outputs of social capital. If one wanted to see this “social production spectrum” as a continuum, the space for social capital itself can range from very narrow to very wide (see Figure 1 for elucidation).

Portes would probably represent the narrow extreme. He includes among the potential sources/inputs: internalised norms (consummatory motivations) such as bounded solidarity, which is present in groups of people thrown into an unfavourable situation, who learn to identify with each other on the basis of their common adversity; and values of reciprocity (instrumental motivations), in which people extend favours in expectation of favours returned by the beneficiary or another person in the social structure some time in the future. As potential effects/outputs of social capital ownership, Portes counts: social control, family support, and benefits through extra-familial networks. Social control refers to the ability to enforce (legal and non-legal) rules by means other than the threat of formal sanctions.

Reviewing Portes' classification of social mechanisms into sources and consequences of social capital makes evident why this would be a relatively narrow perception of what constitutes social capital proper, as the "space" between such wide definitions of source and effect must be small. Some of these inputs to and outputs of social capital can, in contrast to Portes, reasonably be seen as themselves constituting social capital. Differences on where to draw the lines in the social production spectrum could partially be due to different disciplinary approaches. For example, economics scholars seeking to understand the impact social relationships have on economic variables will more likely consider social control as a property of social capital, and only the economic benefits accruing from being able to exert social control as its consequence.

However, Portes rightfully points to the danger of allowing for too large a space for social capital itself on the social production spectrum. Confusing the purported outcomes of social capital with social capital itself can lead to circular reasoning, resulting in tautological statements. An example of such a logical fallacy would be to say: 'A society has lots of social capital. This manifests itself through strong and obeyed norms of civic participation. As a result,

this society enjoys a solid democratic system. Therefore, social capital leads to the strengthening of democracy.’ Such a statement draws into the definition of social capital something that is also an aspect of the alleged outcome of having social capital.

Putnam has been criticised for making tautological statements about civic involvement of people, an indication of high social capital in the society, leading to well-governed nations.

Portes (1998) directly attributes Putnam’s truisms to his extension of the concept to being a property of society rather than of individuals. While we agree that Putnam’s work does indeed at times contain imprecise handling and application of the concept of social capital, Portes’ critique that this stems from Putnam’s macro-perspective appears to be unjustified. It is equally possible to engage in circular argumentation about social capital’s sources and effects while taking a micro-angle. Portes himself delivers an example of that in another part of his paper: “[S]tudent A has social capital because he obtained access to a large tuition loan from his kin and [...] student B does not because she failed to do so” (1998, p.5). Here, the benefits accruing from social capital — tuition — are being confused with social capital — being in a kin network that wants to support its members. Student B may also have high social capital, but her family members are not as wealthy. In this example, it is clear that it is the students who have social capital, not larger entities such as ‘society’, and yet circular reasoning leading to tautologies is perfectly possible.

1.6 Endogenous preferences

The point raised in section 1.2 about internalised norms and utility touches upon the idea of endogenous preferences, which could be an important one for research on social capital.

Whether implicitly or explicitly, much work that seeks to place economic exchange within a social context incorporates social capital (or some proxy for it, in the case of work with data) as

another amongst more traditional independent variables affecting the economic dependent variable. In section 1.3 we argued the importance of going beyond such treatment and modelling the determinants of social capital.

The idea of endogenous preferences, on the other hand, dismisses the notion that individual tastes and preferences are formed only by factors outside the model in consideration (e.g. by biology, etc.) and that policies and economic and social institutions do not have any bearing on them. Treating preferences as exogenous may be dubious but in light of possible complications understandable in models that do not take into consideration social structure. But it is a rather serious omission in formal modelling of social capital, since it is quite far from reality to impose the assumption that one's social context does not affect one's preferences.

In the 1990s, Samuel Bowles and others have contributed significantly to the development of research in this area. Bowles (1999b) provides for a generous scope of what preferences comprise, by including as its elements personal tastes, but also cultural beliefs, habits, and psychological dispositions — in short, all “reasons for behaviour, that is, attributes of individuals (other than [cognitive] beliefs and capacities) that account for the actions they take in a given situation” (p.4).

Such circumscription sets the stage for Bowles for the modelling of the evolution of preferences, which is inspired by attempts from the fields of evolutionary game theory and cultural evolution to model the proliferation of individually-held and communally-held norms and tastes within a group and between groups, respectively. Beside the desire to have a high personal payoff (as similar to the standard economic assumption), two main aspects of human social structure that underlie Bowles' work are the tendency to conformism and the fact that groups are highly segregated. While Bowles' main aim is to explain the evolutionary viability of

altruism and other individually costly forms of group-beneficial sociality, his formalisations could be an important starting point for future research on social capital that seeks to endogenise individuals' preferences by considering its evolution in the social context.

1.7 *Summary*

As in the field of economics the long resistance to reflecting on the effects of social interaction on economic behaviour is slowly waning, the concept of social capital may turn out to be a useful tool to examine these effects. A rushed interest in social capital has produced a large variety of definitions, theoretical frameworks, empirical analyses, and even policy prescriptions. In this section, we sought to provide a selective review of some of the more recent literature on social capital and in doing so, presented topics that warrant more research attention if a richer understanding of economic behaviour as embedded in a social context is to be attained. These topics include:

- *The cost of social capital:* While it is understandable that in the initial stage of interest, attempts were concentrated on identifying the positive outcomes of having a large stock of social capital, it is equally important to investigate its costs to the holders of social capital and the negative externalities imposed on the non-holders. But research should at the same time rigorously analyse the distinct types and bearers of these costs.
- *Formation of social capital:* Rather than treating social capital as some exogenously given input to economic outcomes, understanding the manifold ways how it gets created is critical, particularly if research on social capital is to have any policy relevance.
- *Owners and beneficiaries of social capital:* It may not be necessary that researchers come to a consensus on what type of entity it is that can have or can benefit from social capital, as different types of social capital might be best related to different units of analysis. However, this question ought to be examined more explicitly and in its own right.
- *The social production spectrum:* Disentangling the sources and effects of social capital from social capital itself, while at times seemingly a semantic question, also has bearing on the soundness of policy implications emerging from analysis.
- *Endogenous preferences:* Finally, analytical tools developed in an area outside mainstream economics and preceding the most recent surge in economists' attention to social capital, namely tools from work on endogenous preferences, could be used to develop models of the

effects of social norms on individual behaviour via their effects on the evolution of preferences.

2. SOCIAL CAPITAL AND THE INCENTIVE PROBLEM: CLASSIFICATION OF APPROACHES

The penultimate section will return to address some of the problems pointed out above while developing a model that captures an aspect of social capital which is of special importance to economic development. But this section will first offer a classification of the various existing approaches to social capital, with particular attention to how these approaches address incentive problems in economic transactions.

2.1 The Incentive compatibility problem

The selective review of the recent literature on social capital in the previous section presented analyses of authors from a wide range of disciplines. Part of what makes up the diversity of perspectives as seen in the review are the differences in problems that the authors sought to apply social capital to, and this diversity in problems in turn partially reflects disciplinary interest. In this vein, we will look at social capital through the lens of the incentive problems created by imperfect markets. After describing the incentive compatibility problem, some ideas are offered on the manner in which the nature and dynamics of social interactions may mitigate the consequences of market failure.

Incentive issues lie at the heart of market imperfections, which are marked by asymmetric information about characteristics and actions of people. When some market participants cannot differentiate between goods (or people) with differing characteristics, and when those who can have little incentive to truthfully disclose what they know, then distinct markets cannot exist for these goods. This can lead to adverse selection, which arises when an informed individual's trading decisions depend on her privately held information in a manner that adversely affects

uninformed market participants. As a result, we may see little trade in markets (few contracts agreed upon) in which adverse selection is present, even if a great deal of trade would occur were information symmetrically held by all parties.

Asymmetries of information can also develop subsequent to the signing of a contract. The literature has traditionally distinguished between two types of informational problems that can arise in these settings: those resulting from hidden actions and those resulting from hidden information. The hidden action case, also known as moral hazard, is illustrated by a person's inability to observe the actions of his contracting partner, and the partner's incentives to act in a way that is against the former's interest. The partner's coming to possess superior information about matters relevant to the contract, on the other hand, is an example of hidden information. Since the uninformed agent anticipates his partner's incentives to act in an unfavourable manner, costly adjustments — if such adjustments are at all possible — will have to be made to the contract in order to make the incentives compatible with outcomes favourable to both parties. Thus, the presence of post-contractual asymmetric information often leads to welfare losses for each of the contracting parties relative to what would be achievable in the absence of these informational imperfections.

2.2 The special case of credit market imperfection

We will exemplify this problem using the case of intertemporal exchange when loan contracts cannot be legally enforced. Consider an agent who seeks to invest in a project but does not have own funds to do so, nor does he have access to formal sources of credit. The agent belongs to a social group that is able to pool funds. The group requires a return r on the loaned funds to compensate its members for consumption they had to delay until the loan is repaid. The maximum amount is σW , where W is the group's liquid wealth, and σ is the share of wealth

that the group is willing to lend to the individual. As discussed in a moment, we assume that the group will choose $\hat{\sigma}$ to assure incentive compatibility, meaning that the agent will have incentives to repay rather than default to the group.

We assume that there are two periods. At the beginning of period 1, this social capital stock is given. Also, the agent is able at this time to invest in social capital through the time (L_1^i) that he spends building social networks. In particular, the time thus committed affects the rate δ at which social capital appreciates:

$$S_2 \leq (1 + \delta(L_1^i, D))S_1$$

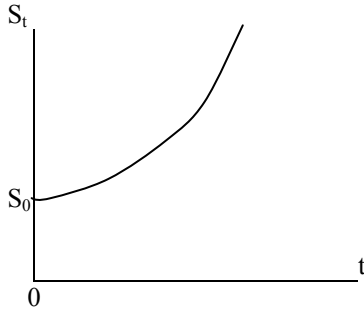
Note that this condition implies that the stock of social capital grows at an increasing rate (see Figure 2). However, this investment comes at a cost of forgone labour income, in the sense that total time L has to be allocated between labour L_1^w and time spent fostering social networks:

$$L_1^i + L_1^w \leq L$$

Finally, it is important to recognise that not everyone can invest time with equal success in any given social group (see also section 3.3.c. and Figure 3). That is, the characteristics D of the borrower (e.g. gender, ethnicity, etc.) matter in terms of his ability to accumulate social capital.

At the beginning of period 2 the agent seeks to borrow funds. The returns from the project $f(B)$ into which he invests these funds are realised in the same period, and these can immediately be consumed. Upon realisation of the return, repayment of the loan with interest is due. Also, each period the agent can consume his labour income wL_1^w where w is the wage per unit of labour time.

FIGURE 2: INCREASING RETURNS TO INVESTMENT IN SOCIAL CAPITAL



Finally, we assume that the individuals get utility both from consumption of material goods as well as from social interaction (friendship) with members of their social network. We further assume that people seek to maximise their utility over both periods, discounting the future, so that the objective function of the model is:

$$u(c_1, S_1) + \beta u(c_2, S_2)$$

where c_t is consumption at time t , $u(c_t, S_t)$ the instantaneous utility function, and $\beta \in (0,1)$ the utility discount factor.

The agent's problem assuming that he intends to repay the loan, is:

$$V_{co}(S_1, \hat{\sigma}, W) \equiv \max_{c, L^i, L^w, B, S} [u(c_1, S_1) + \beta u(c_2, S_2)]$$

$$\text{subject to: } L_1^i + L_1^w \leq L ;$$

$$L_2^i + L_2^w \leq L ;$$

$$c_1 \leq wL_1^w ;$$

$$c_2 \leq wL_2^w + f(B) - (1+r)B \tag{1}$$

$$S_1 \text{ is given; } S_2 \leq (1 + \delta(L_1^i, D))S_1 \text{ where } \delta_L, \delta_D > 0, \delta(0, D) = 0;$$

$$B \leq \hat{\sigma}W .$$

In general, we would expect the individual to allocate labour to both income earning and to cultivation of a social network (for the sake of enjoying friendship).

Note now the qualifier that this is the problem the agent faces *if* he were to co-operate, i.e. repay the loan with interest at the agreed upon time period, as implicit in the consumption constraint (1). But this assumption of co-operation in the above set-up is exactly what the incentive compatibility problem laid out previously would render invalid. In period 2, the agent would be better off were he not to repay. And non-repayment would bear no consequences. Therefore, it should be clear to the group that the agent would not repay the loan, even if it threatens to exclude the agent from the group in the event of non-repayment. Anticipating this, it would not extend the loan in the first place. Thus, a mutually beneficial exchange fails to take place due to the fact that whether the borrower abides by the contract can only be learned after actions taken, and that the agent has an incentive to breach the contract.

More formally, we can note that if the agent does not repay the loan, the constraint for second period consumption given in (1) will be:

$$c_2 \leq wL_2^w + f(B).$$

Denote the optimal solution to the maximization problem with this constraint as $V_{dev}(S_1, \hat{\sigma}, W)$, where the subscript *dev* stands for deviating, or non-co-operative, indicating that the individual will not repay the loan. Incentive compatibility under this narrowly individualistic representation of individual behaviour requires that $V_{co}(S_1, \hat{\sigma}, W) \geq V_{dev}(S_1, \hat{\sigma}, W)$. Implicitly, this condition defines the maximum loan share, $\hat{\sigma}$, that the group will be willing to lend to the individual, *i.e.*,

$$\hat{\sigma} = \{\sigma \mid V_{co}^*(S_1, \sigma, W) \geq V_{dev}^*(S_1, \sigma, W)\}.$$

In this simple model, it is clear there is no positive loan amount for which the individual will have an incentive to repay. The incentive incompatibility of the legally unenforceable loan contract causes the loan market to dry up.

While in this model there is only one opportunity for a loan exchange, an established game-theoretic body of work has shown that the same result would obtain even if repeated exchanges would allow the group's threat of permanent exclusion of the deviating agent to seemingly have more bite, as long as the number of games is finite and known (e.g. Gibbons 1992, Benoit and Krishna 1985). The game theory and other literature has offered a slew of 'solutions' to this problem of inefficient equilibria borne of incentive compatibility constraints. Other papers, while not directly thematising incentive problems, nevertheless provide models which could be used to think about conditions that relax incentive constraints. Of special interest here are those works which seek to explore the workings of social relationships and norms. The next section investigates some of these works, makes an attempt at a useful classification of them, and finally offers an extension of the above model that hopes to capture and make precise the key attributes of social capital.

2.3 Social rules versus moral norms

There is more than one way to categorise the literature on social capital. Some have considered the separate pathways by which social capital is thought to affect the (economic) welfare of individuals. For example, Maluccio, Haddad, and May (2000) list the pathways of social capital's influence as (i) reduction in the costs of transactions by improving information flows, (ii) promotion of consultative decision-making as well as collective action that minimises negative externalities and promotes the production of public goods, and (iii) fostering of time-sensitive exchanges for mutual benefit by developing reputation dissemination. Similarly, a

categorisation that focuses on the function of social capital may identify its forms as reciprocity relationships (or obligation and expectation), information channels, and norms and effective sanctions (Coleman, 1988). But we want to propose a more primitive classification of the literature on social capital. Two fundamental ways can be identified in which the forces operate that result in the existence of an influence of sociality on economic outcomes.

a) Self-enforcing social rules

One such way we shall call the self-enforcing social rules approach. Papers that adopt this approach identify social behavioural rules which, if subscribed to by all other members of a community, become the best strategy for a rational, self-interested agent to follow. Such rules are referred to in this literature as social norms in that they are shared among a group of people and are sustained by the approval of others (Elster 1989).¹ What can make a social norm in the above sense distinct from the various other possible strategy profiles of a given scenario that may also be equilibrium profiles is that the behaviour prescribed by the social norm will have arisen from cultural values, conventions, or the historical circumstances that are particular to the community.

One example of a paper that shows interest in the self-enforcing social rules approach is Ghosh and Ray (1996). It is motivated by the observation that much of economic interaction exhibits the practice of co-operative behaviour that cannot be explained by standard game-theoretic models. The theory of repeated games shows how self-interested individuals can be induced to co-operate by the prospect of future retaliation if they deviate, but this does not explain co-operative behaviour if interactions are with varying instead of the same players. The literature that does examine random-matching games, on the other hand, relies on the process of

¹ However, Elster's conception of social norms goes even further, in that he considers norms as emotional and behavioural *propensities*, not merely as rules.

reputation-building through information flow in the community on players' past actions in order to demonstrate how agents can choose apparently non-Nash strategies.

Ghosh and Ray in contrast advance a model in which co-operation can be sustained despite the fact that agents face varying opponents *and* cannot access information about the strategies these opponents chose with previous players. Referring to a social norm as a behaviour rule which members of the community may follow, Ghosh and Ray seek to identify and describe those social norms that induce a social equilibrium. That is, given that others are following the norm, it is best for an individual player (or a pair of players playing each other) to do likewise.

Such a conception of norms, while having some of the attributes of sociality, offers a mechanistic determination of the equilibrium outcome, and in principle does not differ fundamentally from other game-theoretic treatments of economic interaction that do not claim to model *social* relationships. This is especially true in the case of Ghosh and Ray, where the cultural/social origin of the particular co-operative strategy profile that ends up becoming an equilibrium is not properly thematised.

b) Moral norms

The second way that social capital is conceptualised in the literature will be referred to here as the moral norms approach, following Platteau (2000). Unlike the self-enforcing social rules, moral norms are not so much endogenous outcomes of interactions among individuals acting strategically within a given framework. Rather, moral norms are understood here as cultural beliefs that have the effect of truncating agents' strategy space, or of modifying their preferences.

If incentive incompatible ("co-operative") strategy profiles exist that are more efficient than the equilibrium profiles actually undertaken, the introduction and establishment of moral

norms may favour the selection of the co-operative equilibrium by restructuring the incentives of individuals adhering to these norms. Incentives are brought in line with the co-operative strategy in one of two ways: deviant actions become eliminated from the strategy set of an agent because such actions ‘are not undertaken’ in society, or else they are made more costly — possibly too costly to still be a best response — when adoption of the norms change the agent’s preferences.

While Montgomery (1998) does not explicitly couch his model in terms of moral norms, the paper does serve as a good example of what we mean by this concept. Montgomery offers a role-theoretic conception of social interaction that views the players not as individuals, but as roles (e.g. a profit maximising ‘businessperson’, a non-strategic ‘friend’, etc.). It is individuals’ sense of obligation to adequately fulfil the roles they hold, as well as the actions that these roles prescribe, which drives behaviour and ultimately the equilibrium outcome. These roles, which map into actions via rules that determine what such a role can, should, and ought not to do, are not exogenous nor rigid, but are socially constructed, with the agent’s own actions also feeding into their formation.

Montgomery’s formalisation of role theory and embeddedness could serve as an interesting departure for thinking more carefully about how moral norms, in particular in their capacity to delimit strategy space, influence behaviour in the presence of Prisoner’s Dilemma-type incentive compatibility problems. On the other hand, Samuel Bowles’ wide work on endogenous preferences offers ample models with the help of which the preference-forming capacity of moral norms — as well as the way in which such norms might emerge in the first place — can be explored. Bowles (1998) reflects on the feedback loop in which economic institutions impact the formation of norms that modify preferences, which in turn structure economic institutions. Distinct allocation rules dictate what one must do to acquire one’s

livelihood, and in so doing they impose characteristic patterns of interaction on people, thus influencing the process of human development and affecting tastes, identities and values. For example, as an economic institution evolves, say becomes more formal and market-like, the structure of social interactions changes with it and thus affects the evolution of norms by altering the returns to relationship-specific investments such as reputation-building, affecting the kinds of social sanctions that may be applied in interactions.

Different economic institutions will affect and be affected by norms to varying degrees and in varying ways. The case can be made that imperfect markets with asymmetric information about agents' actions and types, and with the ensuing incentive constraints, are more strongly and intricately tied to norms than markets characterised by perfect or close-to-perfect information and zero transactions costs. Future research might explore this link and seek to describe the consequences for a community's ability to address incentive compatibility problems.

3. SOCIAL CAPITAL AS SOCIAL COLLATERAL

3.1 The model

This paper develops a model in which social networks are valued in and of themselves, but in which they also yield material benefits. We show that the instrumental value of social relationships can only be realised because of the intrinsic value that members place in relationships. In particular, it is this intrinsic value that breaks the incentive incompatibility lock that would otherwise prevent or limit mutually beneficial inter-temporal exchanges between a lender – who we can think of as the collective group – and a borrower within that group.

We include a key feature to the previous simple lending model which will dramatically alter the results. As before, an agent wants to obtain a loan for productive purposes from her social group. Now we assume that default or mere partial repayment of the loan will result in

exclusion from the group, which means that in the 2nd period the agent will lose the total stock of social capital (and the friendship benefits it generates) that she had been working to accumulate. While this has no impact on the funds she obtained for her project, it does mean a direct utility loss when default occurs. In effect, investments in social capital are both ‘sunk’ and ‘specific’. They are sunk in the sense that they have no scrap value if the social network terminates the friendship. They are specific in the sense that past time devoted to cultivating friendships with one group of people has no value with another group of people.

The incentive compatibility condition thus becomes:

$$u(c_1^{co}, S_1) + \beta u(c_2^{co}, S_2^{co}) \geq u(c_1^{dev}, S_1) + \beta u(c_2^{dev}, 0) \quad \text{or:} \quad (2)$$

$$u(wL_1^{wco}, S_1) + \beta u(wL + f(B(S_2^{co})) - (1+r)B(S_2^{co}), S_2^{co}) \geq u(wL_1^{wdev}, S_1) + \beta u(wL + f(B(S_2^{dev})), 0)$$

where $S_2^{co} = (1 + \delta(L_1^{i^{co}}, D))S_1$ and $S_2^{dev} = (1 + \delta(L_1^{i^{dev}}, D))S_1$.

The right-hand side of the incentive compatibility inequality (2) is the total maximised utility of the agent if he deviates, where the superscript *dev* refers to the optimal value for a deviator, and the left-hand side is the total maximised utility of a co-operator, where the superscript *co* refers to his optimal value of the variable. Note that neither the deviator nor the co-operator will choose to invest any time in social networks in period 2, since such investment pays off only in the subsequent period, but there are only two periods in this model. Also, the social group need not be able to observe the agent’s actual time allocation decision in order to establish the borrowing function in this fashion and hence create the incentives necessary for the inter-temporal exchange to take place. By finding out what *would* be the optimal allocations for a deviator and a co-operator, they can set a borrowing function such that deviating would not be an attractive option any longer. In general we would thus expect $\hat{\sigma} > 0$.

The most important change (for the purpose of this paper’s discussion) in outcome relative to the case of absence of social collateral is the fact that now productive activity can be undertaken that otherwise wouldn’t be. Hence the incentive problem borne of asymmetric information that led to inefficient results has been mitigated. In effect, these problems have been solved because the individual’s social capital effectively collateralises the loan relationship, making it incentive compatible.

First-order conditions of the problem show how the agent allocates her time:

$$u_c(c_1, S_1)w = \delta'(L_1^i, D)S_1 \{ \beta(u_s(c_2, S_2) + \beta u_c(c_2, S_2)[f'(B) - (1+r)]B'(S_2)) \}$$

Total time is allocated between labour and “socialising” so as to equate the marginal utility from a unit of labour and that from a unit of time invested in social capital. We can see from the right-hand side that the marginal utility of social time is comprised of the direct pleasure that is obtained from having a social network, as well as the indirect utility from the additional consumption enabled by loan facilitation through social capital.

In a more general model in which agents face stochastic income shocks and seek to smooth consumption, one could consider the conditions under which the agent would save (forgo consumption now) in order to self-insure against risk in the absence of social networks (or in the presence of insufficient social collateral to make networks economically useful). One could also then compare the potential for a detrimental effect of social networks at an aggregate level, when resources are diverted to non-productive social expenditures in order to build social capital that would provide a form of insurance, instead of saving to smooth consumption over low-income periods.

3.2 The nature of social collateral

In this framework, in a sense friendship serves as social collateral for the loan given. The notion of social collateral has commonalities with more familiar forms of physical / economic collateral, but it is also distinct in some ways. Just like traditional collateral (such as land or physical assets), it can be taken away in the event of default, and the borrower is thus made worse off. Also, social collateral can be insufficiently large, in which case the borrower may be denied a loan.

However, a significant difference between social and economic collateral is the former's specificity: The particular social network is valuable to a borrower in the network, but it is not a good that can be easily transferred to someone outside of the group and that can be found immediately valuable by the outsider. This conception of social capital as idiosyncratic (or network-specific) collateral finds its analogue in firm-specific human capital (Hashimoto 1981, Laing 1994) in which training or education is of value to the specific firm that provided for this training, but of little to no value to other firms, even those within the same industry.

A further special attribute of social collateral is that there are no costs to the lender in seizing it. Micro-finance literature details the problems that lending institutions often face in accessing assets of borrowers whenever borrowers misrepresent their asset holdings or hide them. When relationships and good standing in a group serve as collateral, there are no problems of transaction costs of finding the collateral or uncertainty about the amount of collateral due to borrower misrepresentation.

A third difference is that social collateral is not of direct value to the lender, while economic collateral is. Jewellery or a tractor seized by the lender in the case of non-repayment can be exchanged for another good or for money in the market-place, or else can be consumed

(in the jewellery example) or employed directly to yield productive services (in the case of the tractor). In short, economic assets seized from the borrower have market value. On the other hand, a group that withdraws its social links from a defaulting borrower-member gains no direct benefits from doing so. Indeed, if the group is sufficiently small, the group might actually bear a cost from excluding one of its members.

This lack of economic value to the collateral asset can also be seen in other informal types of lending. The prototypical example is a loan from a loan shark who causes the borrower severe pain in the event of default. Such pain has no economic value to the lender, but it serves the primary purpose of collateral which is to solve the incentive compatibility problem. Another example comes from Hague (1998) who describes how the rural electric co-op in Chile began making loans to its client households where failure to repay meant being cut-off from electricity service. In this case, the collateral has negative economic value to the lender, but still serves the incentive purpose.

Hence the only value to the lender of social collateral is its ability to create appropriate incentives for the borrower by imposing costs of deviation on her. Unlike economic wealth held as collateral, it does not also serve the purpose of providing economic redress in the event of default. It should be mentioned that this problem may occur even when the moral hazard problem is solved, e.g. due to exogenous shocks that reduce the return to the borrower's project. In this sense, social collateral does not reduce the risk to the lender as effectively as economic collateral.

3.3 Addressing the critiques of the literature

While relatively contained in structure, our formal framework explicitly or implicitly addresses the various problems and critiques of the literature on social capital discussed in the

first section of this paper, and offers at least a starting point for an effort to bring conceptual clarity into the sometimes vague discourse on social capital.

a) Good vs. bad social capital

In section 1.2. the literature's discussion of 'good' versus 'bad' social capital was reviewed and critiqued. In our model, we frame social capital as addressing the incentive compatibility problem arising from inter-temporal exchanges marked by incomplete contracts. Note that what is fundamental about social capital in this framework is not whether it is good or bad, but the fashion in which it can align individual incentives with actions that each agent would be willing to contract on.

Social collateral that the group holds against a member's claims is used to ensure that the member co-operates (in our model, this means that she repays the loan with interest, but in other contexts it could mean that she reciprocates a favour, etc.). But the co-operative behaviour might be beneficial or detrimental to those outside of the social group. For example, if a tightly knit ethnic group that dominates a certain economic sector of a community uses social collateral to ensure that people hire only within their ethnic group, other groups in the community stand to be harmed as they would have a greater chance of employment in the absence of these social dynamics. On the other hand, it is conceivable that the social collateral mechanism visits positive externalities upon non-members, as when members undertake collective action needed to produce public goods that would otherwise not be produced.

b) Is social capital capital?

The model developed here challenges the concerns of some authors that social capital is an inappropriate term for the idea it is supposed to represent as the attributes of capital are missing (Bowles 1999a, Arrow 2000, Solow 2000). It is perhaps true that not each and every

conception of social capital perfectly fits all aspects of what is originally meant by the term ‘capital’. But neither does the idea of human capital, and for that matter also not certain kinds of tangible capital. The question whether certain forms of social structures and the nature of the ties between individuals in these structures can be usefully described by the capital framework needs to be answered in the affirmative. The model developed above has tried to capture and formalise some of these effects for a specific case of social capital solving the incentive problem in a credit market setting.

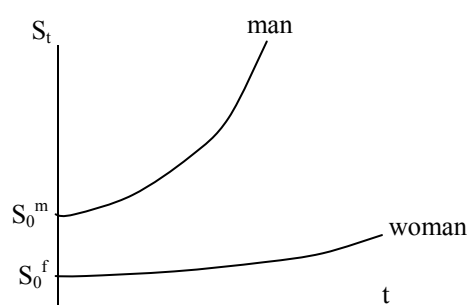
c) Characteristics of the group matter

The stylised case of two students A and B who benefited to different degrees from their kin, and the tautological conclusion that can be drawn from this scenario (see section 1.5.), serves as an indicative example of a simple but critical point: namely that the characteristics of those with whom one has a social relationship matter for economic outcomes. To continue with that example, one must be aware that it is the nature of the relationship the student has with her kin, not how much tuition money she got from them, that is telling about her social capital. But at the same time, acknowledgement that attributes of the kin which are exogenous to the student-kin relationship, such as their wealth or income, affect the *benefits* that can be exacted by the student from her social capital is at least as important in avoiding the tautological pitfall.

Characteristics of people in a social network matter not only for the person that seeks to draw on his social relations for economic gain, as in the previous example, but one’s own qualities will also affect how much benefit can be expected from one’s investment in social capital. In our model we expressed social investment in terms of time committed to fostering relations, where time has the opportunity cost of forgone wage income. The growth pattern of social capital depicted nonconvexities over time (see Figure 2). The point here is that this social

capital function depends on exogenous, possibly immutable characteristics of the person investing in social capital, as Figure 3 demonstrates. This has intuitive appeal. An example would be the possibly differential gain between a man and a woman who commit equal resources to investment in social relations within a male dominated community of traders. The specificity of social capital, and the fact that characteristics of members or would-be members matter, can be useful insights to understanding the way social capital can also translate to social exclusion.

FIGURE 3: DIFFERENTIAL GAINS FROM SOCIAL INVESTMENT



d) The social production spectrum revisited

It had been pointed out earlier that there has been a lack of consensus, or even clarity, on where the generators of social capital end, what constitutes social capital proper, and where its outcomes begin. We use this language since — unlike in the case of other forms of traditional capital where inputs of capital, outputs of capital, and capital itself are treated as distinct concepts — the disparate descriptions of social capital in the literature yield a kind of continuum from inputs to outputs (see section 1.5. for a fuller elaboration on this). While our formalisation of social capital as a response to the incentive compatibility constraint may not capture all the possible ways in which social capital is said to play a role in economic contexts, it at least allows us to tease apart what creates social capital and what are the outcomes of it. Figure 1 depicts this for the example of credit access through social networks.

4. CONCLUDING REMARKS

It is worth re-emphasising that it is not the intention of this paper to review, critique, and offer a theoretical improvement on *all* topics that have been connected to social capital in the literature; nor is it even the intention to conclude the debate about the exact meaning of the term by delivering a final authoritative definition. Rather, the goal of this essay is far more modest. It hopes to contribute to the discourse in this field by offering a way to formalise the workings of social capital in a particular economic context which is however quite pervasive in poor economies: the context of asymmetric information and unenforceable contracts.

While examining this particular question, we believe to have pointed towards some important factors that condition rules of access to social capital. Further work needs to more carefully research how the characteristics of the social network determine the success of a member seeking to draw on her social capital with this group, and which characteristics are most relevant for which form of economic gain. Also, while we hinted at the significance of the *member's* characteristics in her ability to use social networks, the relation between the member's and the group's characteristics should be explored for its role in translating social structures into social capital. Indeed, it appears that this relation is key to the dynamics of social exclusion, the "flip-side" of social capital. This type of research should precede any meaningful empirical, and especially econometric, investigation of social capital.

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