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Middle-Class Consensus, Social Capital and the Mechanics of Economic Development

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Abstract

This paper analyzes a heterogeneous-agents endogenous-growth model incorporating both transaction costs and social capital. An individual can either become an active part of the society's middle-class networks of trust and mutual co-operation, thus making a positive contribution to overall social capital. Alternatively, the individual can stay socially disintegrated and free-ride on the community's social capital. Due to the existence of asymmetric information, agents face a moral-hazard problem on the credit market which gives rise to transaction costs and can be alleviated by private, governmental or social governance structures. An increase in inequality and shrinking of the middle class depresses the community's social capital, which, in turn, weakens the informal social governance system and increases economy-wide transaction costs. As a result a more unequal distribution lowers the economy's growth rate.

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Middle-Class Consensus, Social Capital and the Mechanics of Economic Development*

"By the problem of economic development I mean simply the problem of accounting for the observed pattern, across countries and across time, in levels and rates of growth of per capita income. This may seem too narrow a definition, and perhaps it is, but thinking about income patterns will necessarily involve us in thinking about many other aspects of societies too..."

(Robert E. Lucas (1988, p. 3))

1. Introduction

One of the most important issues in economics is the problem of economic development as defined by Lucas (1988) in the quote given above. What causes economic growth and thus prosperity for the people of the world?, in particular: Where do the huge differences in economic growth and development which can be observed across countries in the real world come from? Neoclassical growth theory tells us that if all economies were intrinsically the same except for their starting capital intensities, then convergence would apply in an absolute sense; i.e., poor countries would tend to grow faster per capita than rich ones. If, on the other hand, economies differ in various respects – e.g. propensities to save, propensities to have children, willingness to work, access to technology, and government policies – then the convergence force applies only in a conditional sense: The growth rate tends to be high if the starting per capita GDP is low in relation to its long-run (steady-state) position. As can be seen, many of these conventional, textbook explanations of cross-country differences in economic growth and development merely move the issue to another, more fundamental level. If, e.g., differences in saving rates across countries determine cross-

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country income or growth-rate differences, then why do some societies save more than others? If much of the international differences in growth rates are explained by diverse government policies, then why do public institutions in some countries perform systematically better than those in other countries? The dissatisfaction with explanations of cross-country differences in growth and development by endogenous variables has led to a recent search in the literature for more fundamental characteristics of societies that determine development outcomes.

The present paper puts forward the existence of a broad middle class the members of which share with each other a fairly homogenous set of social orientations ("middle-class consensus") and the social capital built by social interactions and informal relationships within this middle class as critical determinants of an economy's growth and development. Accordingly, this paper is motivated by and related to two recent strands of literature: First, there is the literature on the economics of social capital which will be dealt with in some detail in section 2 below. Secondly, there is the literature on the role of the middle class – or, more generally, of inequality – for economic growth and development.

With respect to the role of the middle class for economic development there exists an odd dichotomy in economics between its historical and its analytical branches. On the one hand, economic historians have long been emphasizing the importance of a large middle class for economic development. E.g. Landes (1998) reflecting on England's leading role in the process of industrialization points out that the "ideal growth and development society" would be characterized, among other things, by "a relatively large middle class" (pp. 217f.). The development literature and economists, on the other hand, have been virtually silent on the middle class.[1] Only recently, Easterly (2001) puts forward the existence of a middle-class consensus as a critical determinant of international development differences. Defining a "middle-class consensus" as a situation of

relative equality and ethnic homogeneity, he goes on to show empirically that such a middle-class consensus facilitates higher levels of income and growth, as well as higher levels of public goods.

Since "middle class" is – both in its general meaning and as defined in the model presented below – essentially a distributive category, the present paper is also inextricably linked to the large (and yet still growing) literature on inequality and growth. A number of empirical cross-country studies find high inequality – measured in several studies by the share of quintiles 3 and 4, i.e. by the share of the middle class – linked to poor growth performances.[2] Stimulated by both the empirical evidence and the emergence of endogenous growth theory, the theoretical literature has, in turn, worked out three basic sets of transmission channels through which inequality in income and/or wealth distribution might actually slow down economic growth: First, there are *economic* channels. For example in Aghion and Bolton (1997), capital market imperfections deny the poor to the efficient amount of investment; with decreasing returns at the individual level, redistribution to the less endowed will be growth enhancing since the latter's marginal product is higher.[3] A second economic channel stems from the fact that inequality affects an economy's demand structure and may therefore influence innovation incentives (see Zweimüller (2000) or Matsuyama (2000)) and economic development (see Murphy et.al. (1989)). In addition, there are *politico-economic* channels. In models endogenizing both economic growth and public policy, income inequality

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[1] A notable exception are Adelman and Morris (1967, p.30) who note that "in the economic development of Western Europe, the middle class were a driving force" and, accordingly, "the growth of a robust middle class remains of crucial importance in contemporary low-income nations".

[2] A survey and overall assessment of early studies can be found in Bénabou (1996). Note, however, that since the emergence of Deininger's and Squire's (1996) new data set on income inequality the overall empirical evaluation of the effects of inequality on growth has become much more blurred. In particular, Forbes (2000) and Barro (2000) fundamentally challange previous findings of a negative inequality-growth relationship. However, both Forbes (2000) and Barro (2000) use panel data and estimation methods, thus removing county-specific effects and focusing on short-term intertemporal variations, while the argument of both the present paper and most of the previous literature on inequality and growth refers to long-run growth effects of inequality. Furthermore, Deininger and Olinto (2000) find that even in Forbe's (2000) and Barro's (2000) econometric methodology wealth inequality, as measured by the distribution of land, still has a causal negative effect on growth.

[3] Further seminal papers within this subset of theory include Galor and Zeira (1993); Banerjee and Newman (1993); and Bénabou (1996).

influences the balance of power in the political system in such a way as to generate pressure to government to increase income redistribution that, in turn, reduces incentives and, thereby, slows down economic growth.[4]

The present paper aims at highlighting a third set of channels linking inequality and growth that has received much less attention in the literature: *socio-economic* transmission mechanisms.[5] To do so, this paper adds to the existing literature in two significant ways. First, it presents an endogenous growth model in which heterogeneous agents transact under asymmetric information, which gives rise to a moral hazard problem and economy-wide transaction costs.[6] Secondly, it supplements the model's economic sector by an endogenous, rational- choice derivation of social integration, middle-class formation and social capital building. An individual can either become an integral part of the society's networks of trust and mutual co-operation, thus making a positive contribution to overall social capital. Alternatively, the individual can stay socially disintegrated, participate in the society's economic transactions but not contribute to the community's social capital, thus free-riding on others' investments in socio-structural resources. Within this formal framework, the present paper shows that, when the gap between the rich and the poor widens in a society, the size of the middle class whose members make positive contributions to the value of resources embedded in the society's informal relationships shrinks, while the share of social drop-outs in the population increases. The economy's social capital will be depressed which, in turn, increases economy-wide transaction costs and, thereby, slows down capital accumulation. As a result, inequality and economic growth are inversely related.

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[4] Important contributions to this field of study include Bertola (1993); Alesina and Rodrik (1994) as well as Persson and Tabellini (1994). Perotti (1993), as well as Saint-Paul and Verdier (1993), combine asset market incompleteness with the politics of redistribution.

[5] Notable contributions to this field of study include Alesina and Perotti (1996), Benhabib and Rustichini (1996), as well as Knell (1999). According to the former two, inequality may lead to socio-political instability and may thus have a detrimental effect on economic growth. Knell (1999) considers the growth effects of inequality and status-seeking in a social comparison model with different degrees of status preferences for young and old individuals. The basic result is that the negative impact of inequality on growth is aggravated if individuals are more status-oriented.

The rest of the paper proceeds as follows. Section 2 provides a definition of social capital and distils from the emerging economic theory of social capital four stylized facts which are relevant for the current analysis. Sections 3 and 4 develop the formal framework of analysis, starting with decentral optimizing decisions of individual agents and then moving to aggregate variables describing macroeconomic behaviour and the economy's equilibrium growth path. Section 5 explores the effects of increased inequality on the economy's growth rate and section 6 concludes by providing a summary of results.

2. On the Economics of Social Capital: A Definition and Four Stylized Facts

The socio-economic explanation of the inequality-growth link proposed in the present paper is based on the general idea that resources embedded in social networks of mutual trust and co-operation reduce transaction costs and are, thus, an important determinant of long-run economic performance. The concept of *social capital* provides a useful umbrella term to capture the intuition and growing awareness among some (though not all) economists that 'society matters'.[7] There is no single definition of social capital, but rather various approaches to the concept exist. For the purpose of this paper, I choose a definition which is closely related to Coleman's (1988, 1990) original concept and define ***social capital*** as *the set of socio-structural (symbolic) resources – like values, norms, roles and moral obligations – that inhere in systems of social relations, or social aggregates, and that facilitate co-operative behaviour within or between these social aggregates.* While – as said – various approaches to the notion of social capital exist, one can identify certain "stylized facts" about social capital on which most social capital theorists seem to agree. Four of

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[6] The basic transaction-costs set-up follows Zak and Knack (2001) who, however, do not make use of an endogenous growth model but utilize a neoclassical production function.

[7] For instance, Gradstein and Justman (2000) present a political economy framework in which public schooling contributes to economic growth not only by building human capital but also by instilling common norms that increase social cohesion. See also Gradstein and Justman (2002). Temple and Johnson (1998) emphasize that society

them which are of particular relevance for the issues discussed in the present paper will be outlined more closely in the following:

(i) Social capital exhibits public good characteristics. Coleman (1988, 1990), among others, emphasizes the public-good characteristics of socio-relational features that are useful to individuals for specific actions. Once provided, these collective assets and features are nonrival in "consumption" and they are available to all members of the community, regardless of which members actually promote, sustain, or contribute to such resources (non-excludability).[8]

(ii) Social capital is produced by individual investment of time and effort, but in a less direct way than is human or physical capital. As an attribute of the social structure in which a person is embedded, social capital is not the private property of any of the persons who benefit from it. Accordingly, many of the benefits of actions that bring social capital into being are experienced by persons other than the person so acting, i.e. there are positive externalities, and, thus, individual incentives to invest in social capital are systematically depressed. However, many forms of social interactions and networks also either have intrinsic value or are inextricably intertwined with private, instrumental benefits for single agents.[9] As a result, most forms of social capital are built as a by-product of various social activities not necessarily undertaken with a view to strengthen social capital. Putnam (1993) gives the example that "members of Florentine choral societies participate because they like to sing, not because their participation strengthens the Tuscan social fabric".

(iii) An essential part of the instrumental value of social capital lies in the fact that it reduces transaction costs by providing an informal governance structure against opportunistic behavior. In

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matters for growth for reasons other than trust or social capital. However, they also show that one of their indexes of "social capability" may be a useful proxy for social capital in developing countries.

[8] An important example is honesty. If each community member is honest in commercial transactions, all of society benefits due to the reduction of the costs of doing business. Such cost reductions are characterized both by non-excludability and non-rivalness.

[9] E.g., according to Burt (1992) information and influence (over one's own autonomy or that of others) are two types of *private* benefits flowing from social networks. However, a third type of benefit may be identified in the form of *social* solidarity involving co-operation, a sense of social duty and reciprocity not founded on any immediate payback for those contributing to the welfare of others.

a world of bounded rationality, positive transaction costs and imperfect foresight, contracts are necessarily incomplete, incompletely self-enforcing and incapable of dealing with all relevant aspects of human action and contingencies. Furthermore, there exist systematic incentives for opportunistic behavior both before (ex ante) and after (ex post) a transaction takes place. In such a setting, social capital can work to reduce transaction costs by embedding single economic transactions in a system of social relations, thus acting as an informal governance structure against opportunistic behavior. Among other things, socio-structural resources that inhere in systems of social relations generate expectations, informal rules of thumb and common understandings that allow agents to conduct their personal interactions und business dealings efficiently. Well-developed networks are also likely to reduce transaction costs both by reducing search costs and by reinforcing compliance with group norms. Finally, the high levels of trust associated with social capital are critical for many transactions that take place "in the context of an individual forming expectations about actions of others that have a bearing on this individual's choice of action, when that action must be chosen before he or she can observe the actions of others" (Dasgupta (2000), p. 330).

(iv) Growing inequality of income and wealth leads to a decline in social capital. Knack and Keefer (1997), Knack (1999) and Zak and Knack (2001) all find trust and income equality to be positively correlated at the cross-country level. Using US state-level data, Kawachi et. al. (1997) also argue that income inequality lowers social capital. Based on a broad survey of relevant empirical studies, Putnam (2000, p. 359) concludes that "both across space and across time, equality and fraternity are strongly positively correlated"; he goes on to claim that the recent decline in social capital in the US is linked to growing inequality of income and wealth.

3. Social Capital, Transaction Costs, and Economic Growth. A Simple Model

To illustrate the basic interactions between social capital, transaction costs and economic growth, let us consider an economy with a continuum of infinitely-lived consumers who differ only in their respective ownership shares in the economy's aggregate stocks of capital and labor. Each consumer seeks to smooth his consumption over time by saving. However, to access the capital market consumers have to utilize investment brokers. Only the brokers know the actual return earned on an investment and thus face a moral-hazard problem. The brokers' incentives and opportunity to cheat their clients are counteracted by three potential governance mechanisms: First of all, consumers can spend time investigating their brokers in order to reduce the latter's ability to cheat (private governance structure). Secondly, there exist formal institutions, including among others: financial regulations, investigative agencies that oversee brokers, and the judicial system that enforces contracts and prosecutes cheaters (governmental governance structure). Third and finally, a broker's opportunism can be sanctioned by informal institutions (social governance structure). Informal sanctions depend on, or are facilitated by, a system of social relations that transcends the single transaction. Economic transactions are thus embedded in a social structure that determines the rewards for co-operation or penalties for deviation. Accordingly, informal sanctions will be the more effective, the higher an economy's social capital.

The closed economy modelled below consists of four sectors of economic agents: a sector of firms producing the economy's single good; an (implicit) government sector providing a governmental governance structure which is financed via lump-sum taxes paid by private households; a sector of heterogeneous infinitely-lived private consumers; and finally a sector of investment brokers who are distinct from consumers and identical to each other in all relevant respects. Economic agents interact on a goods market, a labor market and a capital market.

Firms and Factor Payments

The key to endogenous growth of the modelled economy is the interaction of learning-by-doing and knowledge spillovers. According to Arrow (1962), the creation and adoption of knowledge is most closely related to experience. In particular, he considers a firm's investment a good measure for this firm's increase in experience and knowledge, since "each new machine produced and put into use is capable of changing the environment in which production takes place, so that learning takes place with continuous new stimuli" (Arrow (1962), p. 157). Romer (1986) uses Arrow's set-up and combines it with the second key assumption that each firm's knowledge is a public good that any other firm can access at zero costs. In other words, once discovered, a piece of knowledge spills over instantly across the whole economy.

More formally, consider a neoclassical production function with labor-augmenting technology for firm *j*,

$$Y_j = F(K_j, W_j L_j), \tag{1}$$

where Y_j denotes the firm's output which is a function of the firm's stock of physical capital, K_j, the firm's labor input, L_j, and the index of knowledge available to the firm. Function $F(\cdot)$ satisfies the usual neoclassical properties and physical capital depreciates at rate δ which is identical for all firms. Combining the assumptions of learning-by-doing and knowledge spillovers outlined above, A_j can be replaced by economy-wide capital K in equation (1). Assuming, furthermore, that the production function takes the Cobb-Douglas form, the production function for firm *j* can be written as

$$Y_j = A_Y (K_j)^{\alpha} (KL_j)^{1-\alpha}, \qquad 0 < \alpha < 1. \tag{2}$$

Let us assume that each firm is small enough to neglect its own contribution to the aggregate capital stock and therefore treats K as given. Denote by $\tilde{y}_j := Y_j / L_j$, $\tilde{k}_j := K_j / L_j$, $\tilde{y} := Y/L$ and $\tilde{k} := K/L$ the usual intensive variables, where L gives aggregate labor input. In equilibrium, all firms make

the same choices, so that $\tilde{y}_j = \tilde{y}$ and $\tilde{k}_j = \tilde{k}$. Economy-wide production in intensive form is thus given by

$$\tilde{y} = A_Y \tilde{k}^{\alpha} K^{1-\alpha}, \tag{3}$$

and the average product of capital amounts to

$$\frac{\tilde{y}}{\tilde{k}} = A_Y L^{1-\alpha}. \tag{4}$$

According to (4), the average product of capital is increasing in the size of the aggregate labor input. On the other hand, this average input is invariant with respect to the capital stock *k* because the learning-by-doing and spillover effects eliminate at the social level the diminishing returns to physical capital which each single firm faces.

Assuming, as usual, that each competitive firm takes factor prices as given, profit maximization and the zero-profit condition imply productive factor inputs to be paid their respective private marginal product:

$$r + \delta = \frac{\partial Y_j}{\partial K_j} = \alpha A_Y L^{1-\alpha} \tag{5a}$$

$$w = \frac{\partial Y_j}{\partial L_j} = (1-\alpha) A_Y K L^{-\alpha}, \tag{5b}$$

where *r* denotes the net interest rate (rental price of capital) and *w* is the wage rate per labor unit. The private marginal product of capital is invariant with respect to the capital stock, is less than the average product and is increasing in *L*.

Households and Factor Accumulation

The economy's household sector consists of a continuum of heterogeneous infinitely-lived consumers, indexed by $i \in [0,1]$, who differ only in their respective relative endowment with

production factors labor, h^i, and capital, k^i. For analytical tractability, let us assume that all consumers are endowed with the same amount of physical capital, i.e. that $\forall i; k_0^i = k_0$.[10] Thus at time *t* they differ only in their individual endowments with the non-accumulated factor labor. The aggregate labor endowment of the economy is normalized to unity:

$$\forall t; H_t := \int_0^1 h_t^i di \equiv 1 .$$

Each individual can earn income from both capital and labor. However, to access the capital market consumers have to utilize investment brokers. Only the brokers know the actual return r_t earned on an investment and, due to this asymmetric information, they are able to appropriate a certain fraction of that return on investments. Consumers have access to an investment investigation technology:

$$\eta[e^i, p, S] : [0,1] \times \mathbb{R}^{2+} \rightarrow [0,1] ,$$

with $$\partial\eta/\partial e^i > 0 , \ \partial\eta/\partial p > 0 \text{ and } \partial\eta/\partial S > 0 \qquad (6)$$

which permits agents to determine the fealty of brokers in reporting investment income.[11] Technology (6) gives the fraction of the actual return to an investment that the consumer receives from his broker. That fraction is determined by three alternative governance structures against the broker's opportunism: A private household i devotes a fraction $e^i \leq h^i$ of his individual labor endowment to investigate the actual return on his or her investments. Secondly, formal institutions, provided by the government and funded by a lump-sum tax τ paid by consumers, seek to detect and punish cheating brokers; let their effectiveness be denoted by *p*. Third and finally, a broker's opportunism can be sanctioned by informal institutions, the effectiveness of which is determined by the economy's social capital *S*. All three governance structures act to constrain the brokers'

[10] Since capital is an accumulated factor, individual capital stocks may, in principle, diverge over time; however, it will turn out that this is not the case in the present model.

opportunism, thus partial derivatives in (6) are positive. Since, furthermore, the governance structures are alternatives to each other, let us assume that second-order cross partial derivatives are negative.

That part of her labor endowment an agent devotes to investigating her broker she can no longer allocate to working in goods production. Accordingly, labor supply of consumer *i*, l^i, is, at any point in time *t*, restricted by

$$e_t^i + l_t^i \leq h_t^i . \tag{7}$$

After-tax income of consumer *i* is thus given by

$$y_t^i = w_t(h_t^i - e_t^i) + r_t \eta_t \left[e_t^i, p_t, S_t\right] k_t^i - \tau_t . \tag{8}$$

Let us assume that all individuals have the same CIES utility function. Allocative decisions of the *i*th individual are determined by solving the following problem:

$$\underset{c_t^i, e_t^i}{\text{Max}}\, U^i = \int_0^\infty \frac{(c_t^i)^{1-\theta} - 1}{1-\theta} e^{-\rho t} dt$$

$$\text{s.t.: } \dot{k}_t^i := \frac{dk_t^i}{dt} = w(h_t^i - e_t^i) + \eta_t^i \left[e_t^i, p_t, S_t\right] r_t k_t^i - c_t^i - \tau_t , \tag{P1}$$

where $\theta > 0$, so that the elasticity of marginal utility with respect to consumption equals the constant $-\theta$, and $\rho > 0$ is the subjective discount rate (or rate of time preference). The necessary and sufficient conditions for a consumer optimum are

$$\frac{\dot{c}_t^i}{c_t^i} = \frac{1}{\theta}\left(\eta_t^i r_t - \rho\right) \tag{9}$$

$$w_t = \frac{\partial \eta_t^i}{\partial e_t^i} r_t k_t^i . \tag{10}$$

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[11] This model of moral hazard on capital markets is adopted from Zak and Knack (2001).

Equation (9) is a standard Ramsey rule of optimal savings with the expected net yield on savings being $\eta_t^i r_t$. According to (10), the utility-maximizing allocation of individual labor input balances the marginal income earned by working with the extra income one can generate by investigating one's broker.

Since individual endowment with physical capital is the same for all consumers, equation (10) implies that in $t = 0$ all consumers make identical choices of "investigative labor", e_0^{i*}. Taken (6) into account, it then follows from (9) that individual growth rates of consumption at time 0 are also the same for all consumers. Furthermore, using the households flow budget constraint in (P1) along with the transversality condition of (P1), one can show that all individuals in $t = 0$ accumulate capital at that very same rate.[12] Thus, interindividual identity of capital endowments is preserved over time and we have for any later point in time:

$$\forall i; \quad k_t^i = k_t, e_t^{i*} = e_t, \eta_t^i = \eta_t .$$

Investment brokers

As mentioned above, to access credit markets consumers must utilize investment brokers who are distributed over the same interval but are distinct from consumers. Brokers take a portion of the investment principle and interest as their wage w^I. For simplicity, brokers are assumed to be risk neutral and do not save. Consumption of a representative investment broker in *t* is, thus, given by

$$c_t^I = w_t^I = \{1 - \eta_t[e_t, p_t, S_t]\} r_t k_t . \tag{11}$$

[12] See Barro and Sala-i-Martin (1995), pp. 142f., 149 for a formal derivation of this result in a learning-by-doing model with knowledge spillovers and homogenous consumers.

Equilibrium growth path

For the labor market to clear in any given period, overall labor input into goods production must equal the sum of individual labor supplies:

$$L_t = \int_0^1 l_t^i di = \int_0^1 (h_t^i - e_t^{i*}) di = H_t - \int_0^1 e_t^{i*} di = 1 - e_t . \tag{12}$$

Equilibrium in the capital market requires:

$$K_t = \int_0^1 k_t^i di = k_t = \tilde{k}_t (1 - e_t) . \tag{13}$$

With population normalized to unity, economy-wide and individual capital stocks coincide, i.e. $k_t = K_t$. Utilizing this normalization, as well as factor payment rules (5), (10) can be written as

$$\frac{\partial \eta_t}{\partial e_t}(1 - e_t) = \frac{1-\alpha}{\alpha} . \tag{14}$$

For any constant values of p_t and S_t, labor spent by each consumer on investigating her broker is also invariant over time. Let us assume from now on that both the effectiveness of public governance structures p and the economy's social capital S are indeed constant over time. Accordingly, the economy's growth rate is given by:

PROPOSITION 1 (Long-term growth)

For a given level of social capital, economy-wide output, physical capital stock and consumption all grow at the common and time-invariant rate of

$$\gamma := \frac{\dot{Y}}{Y} = \frac{\dot{K}}{K} = \frac{\dot{C}}{C} = \frac{1}{\theta}(\alpha A_Y \eta (1-e)^{1-\alpha} - \delta - \rho) . \tag{15}$$

Proof.

Acording to (9), dynamic evolution of consumption and physical capital stock of any individual consumer is characterized by the following growth rate

$$\forall i; \frac{\dot{k}_t^i}{k_t^i} = \frac{\dot{c}_t^i}{c_t^i} = \frac{1}{\theta}(r_t \eta_t - \rho) .$$

As this growth rate is the same for all consumers, ecoomy-wide consumption and physical capital stock, as well as aggregate goods production, also grow at this rate. Taking into account (5a) and the time-invariances derived above, one finally ends up with (15). **q.e.d.**

According to (15), the economic growth rate is the higher, the higher is the fraction η of the actual return to an investment that the consumer receives from his broker and the less labor *e* consumers have to spend on investigating their brokers.

Transaction Costs

The model economy presented so far implies a simple measure of the economy's overall *transaction costs* caused by asymmetric information and opportunistic behavior in the capital market. Economy-wide transaction costs can be expressed as the aggregate amount of labor that agents spend on verifying their brokers' actions. That is, aggregate transaction costs are given by

$$TC_t = 1 - L_t = \int_0^1 e_t^{i*} di = e \,. \tag{16}$$

4. Social Capital, Inequality and Middle-Class Consensus

Social Capital

In order to formalize the intuitive ideas and stylized facts presented in section 2, let us assume that in period *t* an economy's social capital, S_t, simply consists of the sum of symbolic resources, s_t^i, that each of its individual young members is willing to embed into the social structure:

$$S_t = \int_0^1 s_t^i di \,.^{13} \tag{17}$$

[13] The following rational-choice derivation of social integration and social capital building is closely related to the one outlined in Josten (2004).

Due to the public-good characteristics of social capital, no individual has an incentive to directly invest time and/or effort in its accumulation. However, every young individual rationally decides whether she wants to become an integral part of the social community sharing a general social orientation (norms, values, language, culture, etc.) or not. If an individual opts for social disintegration she does not actively promote or sustain social interactions and networks and, thus, does not contribute to the economy's social capital. If, instead, an individual chooses to become an active part of the society's networks of trust and co-operation, she makes a positive contribution to the value of resources embedded in these social aggregates. Accordingly, social capital produced by any consumer *i* is given by

$$s_t^i \begin{cases} = 0, \text{ if } i \text{ is socially disintegrated} \\ > 0, \text{ if } i \text{ is socially integrated.} \end{cases}$$

Individual integration decision

Every consumer bases her rational-choice decision on whether to socially integrate or dissociate herself on a comparison of her own advantages and disadvantages. On the one hand, being part of a community with shared norms, values, language, etc. will improve one's own happiness and well-being.[14] To keep the exposition tractable, let us simply assume that social integration gives any individual member of society a "warm-glow" utility denoted by the strictly positive constant $u_S^+ > 0$. On the other hand, however, social integration does not come without costs. For one to become an integral part of the community, one has to adapt oneself to the group's common attitudes and social orientation which, probably, will deviate from one's own. In terms of Coleman's (1990) rational-choice sociology, by joining a social community an individual gives up the rights to control

[14] With reference to empirical studies on the association between supportive relationships and self-reported happiness and well-being, Putnam (2000, p. 332) sums up that 'in study after study, people themselves report that good

certain of her own actions and transfers these rights to the collectivity. This transfer of rights imposes costs on the individual which are indicated by the difference between the utility level actually secured and the level which would have been secured under full maintenance of individual rights to control one's own actions. As outlined in Coleman (1990, 234f.), these costs will be all the higher, the less the individual's preferred behavior is congruent with the community's prevalent norms or expectations. Since, in the model above, individuals differ only with respect to their labor endowments, it is natural to assume that individual social orientation is (perfectly) correlated with this individual labor endowment. Accordingly, the cultural distance between consumer *i* and the community's social orientation is measured by $\left|\bar{h} - h^i\right|$, where

$$\bar{h} := \int_0^1 h^i di = H \equiv 1$$

denotes the community members' average labor endowment. Furthermore, Coleman's (1990) reasoning implies that the larger this distance, the higher is individual *i*'s disutility from social integration, as indicated by the following disutility function:

$$d_S^i = d_S\left(\bar{h}, h^i\right), \tag{18}$$

where $d_S\left(\bar{h}, \bar{h}\right) = 0$, $\frac{\partial d_S}{\partial\left|\bar{h} - h^i\right|} \geq 0$, $\lim_{h^i \to 0} d_S^i(\bar{h}, h^i) = \infty$, $\lim_{h^i \to \infty} d_S^i(\bar{h}, h^i) = \infty$.[15]

According to (18), anyone with labor endowment equal to average will be able to comply to the social reference norm without any loss of individual well-being. On the other hand, any individual with $h^i \neq \bar{h}$ will still be allowed to join the community, but will suffer from her non-compliance with the social norms. Therefore, her adherence to the community's social orientation comes at a loss of individual well-being. While still enjoying the warm-glow effect of being a part of a

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relationships with family members, friends, or romantic partners – far more than money or fame – are prerequisites for their happiness".

community, non-average individuals, thus, have to weigh u_S^+ against the disutility d_S^i caused by their social integration. For any individual *i*, overall net utility from social integration will be given by

$$u_S^i = u_S^+ - d_S^i,$$

and agent *i* chooses social integration as long as her net utility is positive.

Given the assumptions made about (18), there exist exactly two critical values, denoted by $h^{\underline{j}} < \overline{h}$ and $h^{\bar{j}} > \overline{h}$, respectively, for which the respective consumer will be just indifferent between social integration and social disintegration, for which in other words

$$u_S^+ = d_S\left(\overline{h}, h^{\underline{j}}\right) = d_S\left(\overline{h}, h^{\bar{j}}\right). \tag{19}$$

All individuals with labor endowment between $h^{\underline{j}}$ and $h^{\bar{j}}$ constitute the society's middle class: They share a common set of relatively homogenous social orientations ("middle class consensus") and actively engage in social interactions and networking, thus making a positive contribution to the economy's social capital. On the other hand, individuals with labor endowment below $h^{\underline{j}}$ ("lower class") or above $h^{\bar{j}}$ ("upper class") opt for social dissociation. They participate in the society's economic transactions, but they do not contribute to the community's social capital. Due to the public-goods aspects of social capital, they are, nevertheless, able to capture the instrumental benefits of economy-wide social capital, thus free-riding on others' investments in socio-structural resources.

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[15] A similar disutility function can be found in Gradstein and Justman (2000) refering to the cultural distance between parents and child in an ethnically divided society with public schooling.

Inequality and Social Capital

The continuum of individuals is defined over the intervall [0,1]. Therefore, the fraction j of consumers who are socially disintegrated can be expressed in terms of the value of the cumulative distribution function of the variable h^i, denoted by $F_h(\cdot)$, as

$$j = \underline{j} + \left(1 - \bar{j}\right) = F_h\left(h^{\underline{j}}\right) + \left(1 - F_h\left(h^{\bar{j}}\right)\right). \tag{20}$$

Due to this simple relationship, the effects of an increase in income inequality on an economy's social capital can be derived as:

LEMMA 1.

A more unequal distribution, in the sense of a simple mean-preserving spread in h^i, is associated with a shrinking middle class, while the share of the population that does not contribute to the economy's socio-structural resources increases. Accordingly, a more unequal distribution lowers economy-wide social capital.

Proof. See appendix **q.e.d.**

5. Inequality and Intertemporal Allocation

As shown by LEMMA 1, the share of socially disintegrated consumers and, thus, the size of the middle class depend on the extent of inequality prevalent in an economy. Therefore, a simple mean-preserving spread in the distribution of labor endowments influences the economy's growth rate by its adverse effect on social capital:

PROPOSITION 2 (Growth effects of inequality)

An increase in inequality reduces social capital, increases economy-wide transaction costs and, thus, lowers an economy's growth rate.

Proof.

According to (15), an economy's growth rate is given by

$$\gamma = \frac{1}{\theta}(\alpha A_Y \eta (1-e)^{1-\alpha} - \delta - \rho),$$

where, according to (16), e depicts aggregate transaction costs. None of the determinants of the economic growth rate depends on the economy's distribution in a direct manner. However, both variable e and the value of function $\eta[e, p, S]$ are dependent on social capital, the value of which, in turn, depends on the inequality in the distribution of labor endowments. Thus, we have

$$\frac{\partial \gamma}{\partial \sigma_h^2} = \frac{1}{\theta}\alpha A_Y \left\{ \eta[e, p, S](1-\alpha)(1-e)^{-\alpha}\left(-\frac{\partial e}{\partial \sigma_h^2}\right) + \frac{\partial \eta[e, p, S]}{\partial \sigma_h^2}(1-e)^{1-\alpha} \right\},$$

where

$$\frac{\partial e}{\partial \sigma_h^2} = \frac{\partial e}{\partial S}\frac{\partial S}{\partial \sigma_h^2} \text{ and } \frac{\partial \eta}{\partial \sigma_h^2} = \frac{\partial \eta}{\partial S}\frac{\partial S}{\partial \sigma_h^2}.$$

According to LEMMA 1, $\partial S / \partial \sigma_h^2 < 0$. Furthermore, it has been assumed above that $\partial \eta / \partial S > 0$. Implicitly differentiating optimality condition (10), the effect of social capital on the optimal individual amount of labor allocated to investigation follows as

$$\frac{\partial e}{\partial S} = -\frac{\partial^2 \eta / \partial e \partial S}{\partial^2 \eta / \partial e^2} < 0.$$

Therefore, it follows that $\partial e / \partial \sigma_h^2 > 0$, $\partial \eta / \partial \sigma_h^2 < 0$ and, finally, $\partial \gamma / \partial \sigma_h^2 < 0$. **q.e.d.**

The economy's growth rate is reduced by higher inequality due to the following socio-economic mechanism: A mean-preserving spread in the distribution of individual labor endowments widens the cultural gap between the rich and the poor in a society. Accordingly, for a higher fraction of individuals the costs of compliance with the community's norms outweighs the advantages of social integration. Therefore, the size of the middle class whose members make positive contributions to the value of resources embedded in the society's networks shrinks, while the share of social drop-outs in the population increases. As a result, the economy's overall social capital is depressed. The reduced level of social capital, in turn, reduces the effectiveness of informal governance structures

against opportunistic behavior and, thus, lowers the economy's growth rate via two channels: First, economy-wide transaction costs rise because individual consumers try to compensate the lowered effectiveness of social governance structures by increasing the amount of labor they allocate to their own investigations. This reallocation of labor induces a fall in the marginal productivity of physical capital and, thus, the economy's growth rate. Since, furthermore, the increase in private investigation against opportunistic behavior is only an imperfect substitute for the role of social capital as an informal governance structure, the effective yield on savings that the consumers receive is lowered. Households savings and the rate of private capital accumulation are, therefore, reduced, which is also detrimental to economic growth.

6. Conclusion

This paper has analyzed a heterogeneous-agents endogenous-growth model incorporating both transaction costs and social capital. An individual can either become an active part of the society's middle-class networks of trust and mutual co-operation, thus making a positive contribution to overall social capital. Alternatively, the individual can socially dissociate herself, participate in the society's economic transactions, but not contribute to the community's social capital. Due to the existence of asymmetric information, agents face a moral-hazard problem on the credit market which gives rise to transaction costs and can be alleviated by private, governmental or social governance structures. An increase in inequality, as measured by a simple mean-preserving spread in individual labor endowments, is associated with a shrinking middle class and has been shown to depress the community's social capital, which, in turn, weakens the informal social governance system and increases economy-wide transaction costs. As a result a more unequal distribution lowers the economy's rate of capital accumulation and growth.

All in all, the above analysis – while in itself fairly restrictive – serves to illustrate two points of more general validity. First, the existence of a broad middle class the members of which share with each other a fairly homogenous set of social orientations ("middle-class consensus") and the social

capital built by social interactions and informal relationships within this middle class are important determinants of long-run economic growth and development. Secondly, in addition to economic and politico-economic transmission channels mediating the relationship between distribution and growth, there also exist *socio-economic* ones. As mentioned before, the specific transmission mechanism demonstrated in the present paper should be seen as merely one of several channels through which inequality and social background conditions interact to constrain or foster growth – channels remaining to be further elaborated on in future research.

Appendix: *Proof of Lemma 1.*

Let F_h^1 and F_h^2 be two distribution functions of the random variable h^i. Furthermore, let F_h^2 differ from F_h^1 by a simple mean-preserving spread (as defined in Rothschild and Stiglitz (1970)). This is equivalent to saying that both distributions have the same mean and in addition $\exists \hat{h}^i$ such that $\forall h^i \leq \hat{h}^i, F_h^1(h^i) \leq F_h^2(h^i)$, and $\forall h^i \geq \hat{h}^i, F_h^1(h^i) \geq F_h^2(h^i)$ (single crossing property). For analytical simplicity, let us assume that the single crossing occurs somewhere in the open interval $]h^{\underline{j}}, h^{\bar{j}}[$. Then, the single crossing property of a simple mean-preserving spread implies that

$$\underline{j}^1 := F_h^1(h^{\underline{j}}) \leq \underline{j}^2 := F_h^2(h^{\underline{j}}),$$

while

$$\bar{j}^1 := F_h^1(h^{\bar{j}}) \geq \bar{j}^2 := F_h^2(h^{\bar{j}}).$$

According to (17), economy-wide social capital is given by:

$$S = \int_0^1 s^i di = \int_{\underline{j}}^{\bar{j}} s^i di .$$

Therefore, for any simple mean-preserving spread, we have

$$S^1 := \int_{\underline{j}^1}^{\bar{j}^1} s^i di > S^2 := \int_{\underline{j}^2}^{\bar{j}^2} s^i di . \qquad \textbf{q.e.d.}$$

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