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Dennis J. Snower

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Centre for Economic Policy Research
33 Great Sutton Street, London EC1V 0DX, UK
Tel: +44 (0)20 7183 8801
www.cepr.org

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Dennis J. Snower - dennis.snower@global-solutions.international
Global Solutions Initiative and CEPR

The Interplay of Economic, Social and Political Fragmentation

Steven J. Bosworth*and Dennis J. Snower†

16 October 2019

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*University of Reading
†Hertie School; Blavatnik School of Government, Oxford University; Global Solutions Initiative

1 Introduction

Over the past two to three decades, numerous advanced industrialised economies – with Great Britain and the United States as salient examples – have experienced three phenomena: economic fragmentation[1] (in terms of income inequality), social fragmentation[2] (in terms of social identities) and political fragmentation[3] (over economic and social policies that are "open" versus "closed"). This paper provides an account of how these three forms of fragmentation may be related to one another. The underlying idea is simple, but cannot be captured through standard neoclassical analysis of economic decision making. We show how skill-biased growth – generated in well-known ways through globalisation and technological change[4] – gives rise to income inequality between skilled and unskilled people and how this, in turn, gives rise to disparities in value-driven social identities. In particular, the skilled people tend to adopt individualistic identities (deriving value from individual consumption and individual status) while unskilled people are drawn to communitarianism (deriving value from social affiliations). We then examine how these social disparities generate political divisions, with skilled people tending to prefer policies that are "open" in the economic sense (free markets) and the social sense (cosmopolitanism), while unskilled people tending towards policies that are "closed" economically (protectionism) and socially (nationalism). In this context we explore the conditions under which skill-biased growth leads to rising support for "closed" policies, even when these policies make everyone worse off in terms of good and services consumed.

For analytic simplicity, we consider three social identities: (i) individualists, whose utility arises from consumption of goods and services as well as status concerns, (ii) communitarians, whose utility comes from consumption of goods and services as well as belonging to a social group, and (iii) "multi-affiliates", who pursue both individualistic and communitarian objectives. These identities may also be interpreted in terms of an ideological liberal-conservative divide, with liberals adopting individualistic values, conservatives embracing communitarian ones, and multi-affiliates representing the tolerant middle ground.

In this context we show how the income inequality generated by skill-biased growth leads to the fragmentation of social identities. This social fragmentation involves the expansion of the individualistic and communitarian groups, at the expense of the multi-affiliates. In short, there is a "hollowing out" of the social and moral middle ground and a rise of extreme positions (in both the individualistic and communitarian directions). We then show how these developments lead to a fragmentation of political allegiances to "closed" versus "open" policies. The "closed" policies are characterised as "protectionist-nationalist", with the protectionist element reducing material living standards across the board and the nationalist element promoting the benefits of community building. Protectionist-nationalist policies are

[1] See OECD (2019).
[2] See e.g. McPherson et al. (2006).
[3] See Inglehart and Norris (2016).
[4] See Goldin and Katz (2008).

commonly propounded by populist politicians who appeal to the underprivileged groups by emphasising national pride and opposing the "elites", who tend to pursue status and to be cosmopolitan in outlook. By contrast, the "open" policies are characterised in terms of free-market cosmopolitanism.

We represent skill-biased growth as increasing the productivity of those at the upper end of the skill spectrum, while leaving unchanged the productivity of the rest. This has adverse social consequences for those multi-affiliates with relatively lower skills, since their social status falls relative to that of the skilled. Under these circumstances, a protectionist-nationalist policy – which is assumed to reduce everyone's income proportionally, thereby compressing the income distribution, while also raising the return from community affiliation – will be more attractive to the relatively unskilled multi-affiliates. The communitarians, on the other hand, will be attracted to this protectionist-nationalist policy, provided that the utility they gain from social affiliation exceeds the utility they lose from their lower living standards.[5] In short, our analysis suggests that the relatively unskilled people need not be irrational to support a policy that reduces their income. The reason why such support appears irrational to many observers (e.g. Caplan, 2007) is that they are focused entirely on income as determinant of wellbeing, whereas the unskilled may also be sensitive to status concerns and tribalism.

To make this argument, our analysis needs to be extended beyond the purview of standard neoclassical analysis, in which individuals derive utility from their own consumption, but not from social concerns. Our analysis incorporates two types of social preferences: (i) status concerns for those with an individualist or multi-affiliate identity and (ii) community concerns for those with a communitarian or multi-affiliate identity. People are assumed to adopt the identity from which they can derive the highest utility.

In this context, an individual's preferences are not exogenously given. Rather, the individual can derive utility not only from individual consumption, but also from status, community or both. Status-seeking objectives are depicted in terms of relative income concerns, while communitarian objectives are represented as public goods arising from social affiliations. The source of an individual's utility depends on the individual's social identity. People's identities are represented in terms of the importance they attach to status versus communitarian objectives. Following R. Akerlof (2017) in the framework of G. A. Akerlof and Kranton (2000), we assume that these identities are not exogenously given, but that people gravitate towards those identities which most promote their wellbeing.[6] We will show that high-skilled individuals adopt an individualistic identity, low-skilled take a communitarian identity, and those of intermediate skills adopt a multi-affiliated identity. By focusing on the self-interested gains from consumption, neoclassical theory overlooks the attractiveness of status to the winners of skill-biased growth and the attractiveness of social affiliation (through contributions to a common cause) by the losers - where "winners" and "losers" are classified in terms of their access to consumption goods.

[5] For simplicity, communitarians are assumed to focus on community but not on status, which implies that they gain no utility from income compression.

[6] The adoption of identities could be unconscious; it need not be the result of deliberate choice.

The paper is organised as follows. Section 2 discusses underlying ideas. Section 3 models the economic activities of the individualists and communitarians and describes the principles of identity choice between these groups. Section 4 investigates the influence of skill-biased technological change on this identity determination, corresponding to a choice of moral values. Section 5 explores the implications for government policy, showing how skill-biased technological change may give rise to a moral divide that generates protectionism. Section 6 concludes.

2 Underlying Ideas

Our analysis connects a number of different themes concerning the rise of social fragmentation in recent years, as evidenced by the support for Donald Trump's Presidency, Brexit, and right-wing nativist parties in various continental European countries. There is a wide-ranging debate concerning the determinants of this process. Is driven by economic, cultural, ideological or moral forces?

In the economic domain, it has been argued that the divide between conservatives and liberals has arisen from a widening income divide between the winners and losers from globalisation and skill-biased technological advance.[7] By contrast, Inglehart and Norris (2016) have argued that the main driver of the rising support for populism is "cultural backlash" of previously dominant segments of the population to progressive cultural change. This backlash can be understood as a clash of moral values. In the ideological domain, Wilkinson (2019) and others have argued that rising urbanisation has segregated societies into ethnically diverse, cosmopolitan, liberal groups and sparse, more uniform, white, conservative groups. The improving fortunes of the urban populations relative to the rural ones makes the latter sympathetic to populist scapegoating of ethnic minorities and immigrants.

Our analysis highlights major interactions among these drivers of social fragmentation.[8] The upshot of this analysis is that the prominent issue occupying the public debate in America and many European countries – Are the current social divides due to economics, culture, values or ideology – may focus on the wrong question, because the action may well lie in the interaction among these realms. Our analysis identifies prominent channels of interaction. It thereby generates testable hypotheses.

Our analysis connects the economic phenomena of income inequality and job insecurity with the social and cultural phenomena of identity formation,[9] values and moral psychology,[10] and political economy.[11] We thereby explore a reflexive relation between economic, social, ideological and political divides. Our analysis rests on a number of building blocks discussed below.

[7] See, for example, Autor et al. (2017), Becker et al. (2017), Dal Bó et al. (2018), Colantone and Stanig (2018a,b), Guiso et al. (2017), and Lechler (2019).

[8] The interaction of ideas and interests is explored in Rodrik (2014).

[9] Our analysis rests on the fundamental insights in identity economics of G. Akerlof and R. Kranton (2000; 2010) and elsewhere. We follow R. Akerlof (2017) in modelling identity determination as a utility maximisation problem over values given fixed abilities of heterogeneous agents.

[10] For example, Haidt (2012).

[11] For example, Stiglitz (2012) and Inglehart and Norris (2016).

2.1 Individualism versus Communitarianism

The relation between moral systems and social structure has been studied by anthropologists and cultural psychologists, who emphasise the distinction between individualism and collectivism (stressing the independence and interdependence of individuals, respectively).[12] This distinction is closely related to Tönnies's contrast between "Gesellschaft" (civil society) and "Gemeinschaft" (community). In the former, people are free to make their own choices as long as they don't harm or cheat one another; in the latter, people's actions – in the context of small communities connected through long-standing propinquity and cultural affinity – are monitored, judged and regulated by others.

Kesebir and Haidt (2010) have shown empirically that individualistic social settings (such as those in large Western cities) draw predominantly on the moral concerns of care and fairness, while collectivistic settings (such as those in small, traditional villages) draw on a wider range of moral sources, including loyalty, respect for authority and sanctity. In this sense, the liberals with individualistic identities draw on narrower moral foundations than the conservatives with communitarian identities. We will show how skill-biased growth induces the individualists to withdraw some of their support from social communities in order to focus more on materialistic status seeking. In this sense, skill-biased growth can lead to a narrowing of a society's moral foundations (as described further in Section 4) which has a feedback effect on economic policy (see Section 5).

2.2 The Liberal-Conservative Divide

The divide between individualism and communitarianism is also manifested in the widespread liberal-conservative divide that has manifested itself in many of advanced and emerging economies in recent years: Democrats versus Republicans in the United States, Remainers versus Leavers in the Brexit referendum, the cosmopolitan elites versus the populist nationalists, the secular materialists versus the religious traditionalists, and so on. Our conceptions of liberalism and conservatism are intimately associated with different approaches to economic and social policy. "Liberals" advocate universalist ideologies in support of individual economic and political freedoms (human rights, civil liberties, protection of minorities, checks and balances), the free movement of goods and services, labour, capital and ideas across national borders), and free-market economic activity shaped by equity- and efficiency-promoting policies to deal with market failures, typically conducted by technocratic experts. By contrast, "conservatives" advocate ideologies in support of traditional social structures, including the political interests of a nation (e.g. "America first") or a religion (e.g. Islamism). Among the conservatives, populists do so in the name of "the people" (citizens of the nation or members of a religious community) as opposed to "the elite". In recent years, this liberal-conservative divide has played a major role in politics (such as in the Brexit vote and the election of Donald Trump) and economic policy (such as protectionism and migration

[12] For example, Shweder and Bourne (1984), Markus and Kitayama (1991) and Triandis (1995).

restrictions). Our analysis examines the economic causes and consequences of this divide.

We thereby provide an explanation for why the unskilled voters often support protectionist-nationalist policies, even though these policies make everyone materially worse off (i.e. reduce everyone's access to consumption). While liberal politicians tend to focus on people's individualistic needs, conservative politicians are more sensitive to people's need for communal affiliations. An analysis of the liberal-conservative divide requires the recognition that people are not just maximisers of their individual utilities, but are also social creatures pursuing social relationships within social groups. From the individualistic perspective, it is puzzling why unskilled voters should support protectionist policies. But once identity formation is brought into the picture, their voting behaviour may be understood as an expression of their sense of community and their aversion to low status, relative to their income. In fact, their vote for protectionist-nationalist policies is undertaken as an expression of their tribalism.[13] There is little if any evidence to suggest there are *economic* reasons why Northern England would favour Brexit,[14] or why Appalachia would benefit from a U.S. trade war with China. Our theory provides a parsimonious link between the relative economic deprivation of such sub-national groups and their support for protectionist economic policies.

Sociality within communities has been an integral part of human psychology and behaviour, though ignored in the individualistic decision making of conventional microeconomic theory. Throughout the evolutionary process, human beings have struggled with the "Me-Us problem", balancing the interests of the individual against those of his or her social group (see Joshua Green's *Moral Tribes*, 2013). The success of the human species is due in large part to our ability to cooperate with one another beyond the bounds of kinship, in part through the creation of moral intuitions and precepts that honour the demands of "Us" along with moral narratives that widen the domain of "Us" beyond our tribe to encompass nations, empires and civilisations. Accordingly, this paper presents an economic model that is appropriately extended beyond the individualistic decision making to include affiliative relations within social groups.

The liberal argument for compensating the losers from globalisation and technological change – namely that the tax-transfer system should ensure that the losers are compensated for their economic losses – may not hold. The reason is that the losers may well need to be compensated for more than that, namely, they also for their social losses. Our analysis suggests that under the influence of the skill-biased growth generated by globalisation and technological advance, the relatively unskilled individuals are "left behind" in in two senses: They lose positional status and they experience the unravelling of their communities. Our analysis indicates that these disadvantaged people are drawn to conservative politicians who promise the restoration of their status and communities, while becoming disaffected from liberal politicians who remain focused on their purchasing power alone.

[13] When voting is an expression of identity, people may have an incentive to vote even though none of them considers his or her vote as decisive for the outcome. (See, for example, Brennan and Hamlin, 1998 and Hillman, 2011).

[14] Though support for Brexit was significantly associated with local economic grievances (Arnorsson and Zoega, 2018). See Fetzer (In press) on the link between austerity and the Brexit vote.

Many commentators have noted that the winners from the globalisation and innovation process tend to favour cosmopolitan social and political goals, such as international status comparisons and free international trade. This is scarcely surprising, since the process of globalisation and innovation relies heavily on the free movement of lobar, capital and ideas (see Baldwin, 2016). The losers from the globalisation process, by contrast, attach relatively more weight to communal goals, which are more inward-looking than the cosmopolitan goals of the winners. When the inward-looking, disadvantaged group gains the political upper hand, governments may embrace pursue protectionism, even if this reduces this group's living standards.

2.3 Moral Values

Individualistic and communitarian objectives are consistent with those identified by various social and moral psychologists and anthropologists. In particular, Shweder and co-authors have proposed that different cultures provide two distinct answers to the question of how the needs of individuals and groups are to be weighted: the "sociocentric" approach subordinates the needs of individuals to those of their social groups, whereas the "egocentric" approach gives priority to the needs of individuals (e.g. Shweder and Borne, 1984). The sociocentric approach was dominant in most ancient cultures and the individualistic approach was central in the Enlightenment. In Shweder's analysis, the sociocentric approach follows the values of community and divinity, while the egocentric approach adheres to the value of autonomy. In Schwartz's investigation of moral universals (e.g. Schwartz, 1994), individualistic values cover those favouring universalism (appreciation, tolerance and wish to protect all people), independent thought and action, openness to novelty and change, status and control, achievement, and gratification of the senses; whereas sociality-based values cover acceptance and commitment to traditions, conformity and self-control in line with social expectations, and desire for harmonious, stable and safe social relationships . In Haidt's moral foundation theory (e.g. Haidt, 2012), the individualistic values involve care and fairness, and the sociality-based values involve loyalty, authority and sanctity.

Several important scholars have noted that the rise of cosmopolitan economic liberalism has led to a narrowing of our moral foundations. This development has received much attention recently in response to prominent analyses of the commercialisation of daily life by Sandel (2012), Satz (2010), and R. & E. Skidelsky (2012). There is a large literature on decline of sociality in favour of individualistic status pursuits in recent decades (e.g. Putnam, 2000; McPherson et al., 2006; Rahn and Transue, 1998). Various authors have investigated how the rise of individualism is related to a widespread decline in trust, a rise in narcissism and a fall in the sense of connectedness to others (e.g. Bosson et al., 2008; Putnam, 2000; Twenge, 2006; Twenge and Campbell, 2010). The rise of positional competition has been associated with rising affluence (e.g. Hirsch, 1976; Frank, 1999).

The narrowing of moral foundations in the West has recently been investigated by Collier (2018), who

argues that neoclassical economic analysis has contributed to this narrowing in business, government and civil society. In this analysis, individualistic and materialistic values are reduced to a Benthamite core, in which each individual's self-interest is reduced to the maximisation of individual utility from consumption and social welfare is the sum of all individual utilities in a society. As an individual's marginal utility is assumed to decline with consumption, the maximisation of social welfare involves distributing consumption "fairly", in the sense of equalising consumption across individuals. Sociality-based values are ignored in this analysis.

In this context, the moral concern of "care" has shrivelled to providing needy citizens with consumption and the concern of "justice" has shrunk to distributional fairness, interpreted as equalising consumption across citizens. The socially desirable equalisation of consumption through taxes and transfers is viewed as constrained by efficiency considerations. The "equity-efficiency tradeoff" described the degree to which the size of the national pie shrank when the pie was redistributed. From the perspective of orthodox neoclassical economics, society consists of households, firms and the government. Households and firms are assumed to be utterly amoral, maximising their own utility and profits, respectively. The only moral actor left is the government, whose moral choices are reduced to choosing a point on the economy's equity-efficiency tradeoff. As economic modelling came to dominate the state's economic decisions, management of the economy became increasingly technocratic, as government bureaucrats became the main implementers of economic policies, balancing equity and efficiency objectives focused on consumption opportunities.

The narrowing of moral foundations – associated particularly with the rise of cosmopolitan economic liberalism – has received little attention in economic analysis. This paper presents a simple model of this moral narrowing, arising from the interaction between skill-biased growth and identity formation and, in this context, we investigate what the resulting evolution of identities implies for the public choice of economic policies.

3 Identity Formation

Our model distinguishes among three identities: an individualistic identity (I), a communitarian identity (C), and a multi-affiliated identity (M). We thereby aim to capture Haidt's empirical observation that people can be sensitive to a broader range of values than individualism, to varying degrees.

The individualistic identity is based on egocentric values, linked to individualistic and positional objectives (individualistic consumption of marketable commodities, as well as positional competition in terms of these commodities). These values are centred on personal autonomy (including the values of personal agency, personal achievement and status) alongside respect for the intrinsic worth of all other other individuals.

The communitarian identity is driven by the sociocentric values of affiliation, including values of loyalty to one's social group, respect for authority, as well as sensitivity to issues of sanctity and purity (around which social groups often cohere). These values induce individuals to contribute to a common cause, whose benefits are shared by all members adhering to communitarian values. These benefits may include economic goods (such as public education and health services) and cultural goods (such as support for national, ethnic or religious traditions).[15] These goods are club goods, since they are excludable (i.e. their benefits are not available to those who do not choose communitarian values) and non-rival (i.e. since one individual's consumption does not interfere with another's consumption of the goods).

The multi-affiliated identity adopts both sociocentric and egocentric values and utility is derived from both individualistic and communitarian pursuits.

In this context, when people switch from a multi-affiliated identity to an individualistic one, a moral narrowing occurs. A similar narrowing of values happens when people switch from a multi-affiliated to a purely communitarian identity: people cease to become competing individuals and identify themselves with a broader community such as the nation.

Let U_i^I represent the utility from an individualistic identity (pursuing egocentric values), U_i^C represent the utility from a communitarian identity (pursuing sociocentric values), and U_i^M represent the utility from a "multi-affiliated identity" (pursuing both sociocentric and egocentric values). Each individual i adopts the utility-maximising identity:

$$U_i = \max\left\{U_i^I, U_i^C, U_i^M\right\}.$$

We now proceed to specify each of these utilities.[16]

3.1 Individualistic Identity

A person with an individualistic identity can derive utility from self-interested and status-oriented pursuits, both of which are expressions of egocentric values. The utility from an individualistic identity is

$$U_i^I \equiv U_i^s + x_i, \tag{1}$$

where x_i represents individual i's self-interested consumption of private goods (excludable and rival), U_i^s is the individual's utility from status-seeking activities (described below). The relative weight of self-interested and status-seeking pursuits in the utility function may be adjusted through the parameters π

[15] This distinction is analogous to that between individualistic and prosocial value orientations (e.g. van Lange, 1997).

[16] This model is superficially similar to that used in Snower and Bosworth (2016), though the purposes of the two models are obviously different.

and ε of the status-seeking utility function below.[17]

Each individual i produces x_i market goods, whose production function is $x_i = \beta_j (1 + a_i)$, where a_i is the individual's skill or ability (higher a_i stands for higher ability) and $\beta_j \in \{\beta_u, \beta_s\} > 0$ is a "productivity parameter" that we will use to capture the return to market activities. β_j may change in response to globalisation, automation, public policy, or other structural economic shifts. When $\beta_u \neq \beta_s$ the returns to market activities may differ for people of different socioeconomic status. Skill-biased growth can in this way be represented by a rise in β_s while β_u remains constant. Ability is uniformly distributed over the range $[0, 1]$. We assume that in the lower segment of the ability distribution ($a_i \in [0, a_s]$), the productivity parameter is $\beta_j = \beta_u$ (where subscript u stands for "unskilled", whereas for the upper segment of the ability distribution ($a_i \in (a_s, 1]$) the productivity parameter is $\beta_j = \beta_s$, where $\beta_u \leq \beta_s$.

Each person i competes with a random member of society. The resulting utility from positional competition with another person j is

$$U^s_{i,j} \equiv \pi \max(x_i - x_j, 0) - \varepsilon \max(x_j - x_i, 0), \tag{2}$$

where $\pi > 0$ is a *pride parameter* and $\varepsilon > \pi$ is an *envy parameter*. Boyce et al. (2010) suggest that $\varepsilon > \pi$, which we will assume. Status seeking is often personalised, focused on individuals who have one's attention at a particular time. We adopt however the simplification that attention is proportionally distributed across society in order to derive qualitative results as parsimoniously as possible. The individual's expected utility from competing with a random outsider is

$$a_i U^{\underline{s}}_i + (1 - a_i) U^{\overline{s}}_i \tag{3}$$

where here a_i represents the probability of encountering an inferior-ability outsider and $U^{\underline{s}}_i$ is i's pride-driven utility from this encounter, whereas $(1 - a_i)$ is the probability of encountering a superior-ability outsider and $U^{\overline{s}}_i$ is i's envy-driven utility from that encounter. Denote by

$$U^s_i \equiv E\left(U^s_{i,j}\right) = a_i U^{\underline{s}}_i + (1 - a_i) U^{\overline{s}}_i \tag{4}$$

i's overall expected utility from status seeking. Taking the expectation of $U^s_{i,j}$ over the appropriate

[17] Specifically, the relative magnitudes of π and ε represent the relative strengths of the pride and envy effects, respectively; the absolute magnitudes of both π and ε reflect the weighting of status-seeking versus self-interested pursuits in the utility function.

intervals yields

$$U_i^s = a_i\pi \int_0^{a_i} (x_i - x_j)\, da_j - (1-a_i)\,\varepsilon \int_{a_i}^1 (x_j - x_i)\, da_j \tag{5}$$
$$= \begin{cases} \frac{1}{2}\left(a_s\,(2+a_s)\,(\beta_s - \beta_u)\,\varepsilon - (3\beta_s - 2\,(1+a_i)\,\beta_u)\,\varepsilon - a_i^2\beta_u\,(\varepsilon - \pi)\right) & a_i \le a_s \\ \frac{1}{2}\left(\beta_s\left(a_i^2\pi - (1-a_i)^2\,\varepsilon\right) + a_s\,(2+a_s)\,(\beta_s - \beta_u)\,\pi\right) & a_i > a_s \end{cases}.$$

This equation shows how utility from positional competition depends on an individual's ability level.

3.2 Communitarian Identity

We assume that a person with a communitarian identity derives utility from communitarian pursuits that express sociocentric values, as well as self-interested pursuits, since everyone is instinctually inclined to satisfy self-interest to some degree. The utility from a communitarian identity, pursuing sociocentric values, is

$$U_i^C \equiv U_i^q + x_i \tag{6}$$

where U_i^q represents the benefit from communitarian activities, which yield non-rival benefits to the participants. The relative weights of the communitarian and self-interested pursuits in the communitarian utility function can be adjusted through the parameter α in equation (7) below.

Since the benefits are available only to individuals pursuing sociocentric values and since one individual's enjoyment of these benefits does not go at the expense of another individual's enjoyment, the outputs of the communitarian activities are club goods.

Since the benefits from these goods are shared by all individuals pursuing sociocentric values, we specify the utility derived from these club goods simply as

$$U_i^q = \alpha, \tag{7}$$

where α is a constant.[18]

3.3 Multi-affiliated Identity

The utility from a multi-affiliated identity, pursuing both egocentric and sociocentric values, is

$$U_i^M \equiv \frac{\phi}{\sigma^C} U_i^q + \frac{1-\phi}{\sigma^I} U_i^s + x_i \tag{8}$$

[18] In practice, the benefits that communitarians derive from their club good may rise with the size of the club, either because more support for the community generates a greater sense of pride in the community or because the communitarians resent the "cosmopolitans" who have abandoned their community objectives. For analytical simplicity, these considerations are not included in our analysis. Including them would further strengthen our qualitative conclusions.

where ϕ is the "salience parameter" $(0 < \phi < 1)$, measuring the degree to which the communitarian utility is salient for someone with a multi-affiliated identity, and σ^C and σ^I are the weights of the communitarian and individualistic goals for the multi-affiliated identity, respectively.

In order to avoid trivial results, we assume that $\sigma^I, \sigma^C < 1$ with $\sigma^C > \phi$ and $\sigma^I > 1-\phi$. The parameter σ captures the degree of imperfect substitutability between communitarian activities and status-seeking activities.

The human needs for material prosperity and sociality are not seen by psychologists and neuroscientists substitutable for one another (see Panksepp, 1998). There is a wide literature in the psychology of wellbeing showing that an excess of materialism is detrimental to happiness (Ryan and Dziurawiec, 2001; Kasser, 2002; Roberts and Clement, 2007). These effects may be non-linear however, and some materialism is happiness-promoting (Hudders and Pandelaere, 2012; Pieters, 2013).

3.4 Identity determination

Expressing the three utility functions in terms of ability, we find

$$U_i^I = \begin{cases} \frac{1}{2}\left(a_s\left(2+a_s\right)\left(\beta_s-\beta_u\right)\varepsilon - \left(3\beta_s - 2\left(1+a_i\right)\beta_u\right)\varepsilon - a_i^2\beta_u\left(\varepsilon-\pi\right)\right) + x_i & a_i \leq a_s \\ \frac{1}{2}\left(\beta_s\left(a_i^2\pi - \left(1-a_i\right)^2\varepsilon\right) + a_s\left(2+a_s\right)\left(\beta_s-\beta_u\right)\pi\right) + x_i & a_i > a_s \end{cases}$$

$$U_i^M = \begin{cases} \frac{1-\phi}{2\sigma^I}\left(a_s\left(2+a_s\right)\left(\beta_s-\beta_u\right)\varepsilon - \left(3\beta_s - 2\left(1+a_i\right)\beta_u\right)\varepsilon - a_i^2\beta_u\left(\varepsilon-\pi\right)\right) + \frac{\phi\alpha}{\sigma^C} + x_i & a_i \leq a_s \\ \frac{1-\phi}{2\sigma^I}\left(\beta_s\left(a_i^2\pi - \left(1-a_i\right)^2\varepsilon\right) + a_s\left(2+a_s\right)\left(\beta_s-\beta_u\right)\pi\right) + \frac{\phi\alpha}{\sigma^C} + x_i & a_i > a_s \end{cases}$$

$$U_i^C = \alpha + x_i.$$

Note that both the individualistic and communitarian utility functions are each a special case of the multi-affiliated identity, with $\sigma = 1$, $\phi = 0$ and $\phi = 1$ respectively. This means that individualists and communitarians gain utility from a narrower range of activities than those who are multi-affiliated, on account of their narrower range of values.

In this context, the following proposition describes the implications of economic fragmentation for social fragmentation.

Proposition 1: From Economic to Social Fragmentation *For parameter restrictions ensuring that all three identities (individualistic, communitarian and multi-affiliated) are adopted by some people, (i) those of relatively low ability adopt a communitarian identity, (ii) those of relatively high ability adopt an individualistic identity, and (iii) those in the intermediate range of the ability distribution adopt a multi-affiliated identity.*

Proof *For $a_i = 0$ (the lowest ability level), utility from the communitarian identity exceeds that from the multi-affiliated identity:*

$$U_i^C - U_i^M = \frac{1}{2\sigma^I}\varepsilon\left(1-\phi\right)\left(\left(1-a_s\right)\left(3\beta_s - 2\beta_u\right) + \left(1-a_s\right)a_s\beta_s + a_s^2\beta_u\right) + \frac{\alpha\left(1-\phi\right)}{\sigma^C} > 0.$$

Furthermore, for $a_i = 1$ (the highest ability level), the individualistic identity is preferred to a multi-affiliated identity:

$$U_i^I - U_i^M = \frac{1}{2\sigma^I}\left(\sigma^I - \left(1-\phi\right)\right)\pi\left(\beta_s + a_s\left(2+a_s\right)\left(\beta_s - \beta_u\right)\right) - \frac{\phi\alpha}{\sigma^C} > 0$$

provided that α is not too large. This means that the utility from communitarianism cannot exceed the utility from status for the richest person in society. In order to ensure that all three identities command some share of the population, we assume that the individual with $a_i = a_s$ prefers to adopt the multi-affiliated identity. [19]

Next, we show that the utility of adopting the individualistic identity over the multi-affiliated identity is continuously increasing in ability a_i on the interval $[a_s, 1]$. Differentiating $U_i^I - U_i^M$ with respect to a_i,

$$\frac{d\left(U_i^I - U_i^M\right)}{da_i} = \frac{\beta_s}{\sigma^I}\left(\sigma^I - \left(1-\phi\right)\right)\left(\left(1-a_i\right)\varepsilon + a_i\pi\right) > 0.$$

Thus the intermediate value theorem ensures that there is a cutoff ability $\widehat{a}^I$, at which the individual is indifferent between the two identities. Above this cutoff value $\widehat{a}^I$, individuals adopt an individualistic identity and below it they accept a multi-affiliated identity.

Next, we show that the utility of adopting the multi-affiliated identity over the communitarian identity is continuously increasing in ability a_i on the interval $[0, a_s]$. Differentiating $U_i^M - U_i^C$ with respect to a_i,

$$\frac{d\left(U_i^M - U_i^C\right)}{da_i} = \frac{\beta_u}{\sigma^I}\left(1-\phi\right)\left(\left(1-a_i\right)\varepsilon + a_i\pi\right) > 0.$$

Thus the intermediate value theorem ensures that there is a cutoff ability $\widehat{a}^C$, at which the individual is indifferent between the two identities. Above the cutoff value $\widehat{a}^C$, individuals adopt a multi-affiliated identity and below it they take on a communitarian identity.

The cutoff abilities $\widehat{a}^I$, $\widehat{a}^C$ determine the relative sizes of the individualistic, multi-affiliated and communitarian populations.

[19] *This entails* $\frac{1}{2\sigma^I}\left(\sigma^I - \left(1-\phi\right)\right)\left(\left(\left(1-a_s\right)^2\varepsilon - a_s^2\pi\right)\beta_s - \left(2a_s + a_s^2\right)\left(\beta_s - \beta_u\right)\pi\right) + \frac{\phi\alpha}{\sigma^C} > 0$ *and* $\frac{1}{2\sigma^I}\left(1-\phi\right)\left(a_s^2\beta_u\pi - \left(2\left(1-a_s\right)\left(\beta_s - \beta_u\right) + \left(1-a_s^2\right)\beta_s\right)\varepsilon\right) - \frac{\alpha\left(\sigma^C - \phi\right)}{\sigma^C} > 0.$

Figure 1: The distribution of values in society.

4 The Influence of Skill-Biased Technological Change

This section investigates the influence of economic fragmentation (e.g. skill-biased productivity improvements arising from technological progress or globalisation) on the size of the three social groups. These are defined by changes in the location of the marginal individuals (with abilities $a_i = \widehat{a}^I$ and $\widehat{a}^M$), who determine the size of the individualistic and communitarian groups respectively. We represent skill-biased technological change by a rise in β_s, holding β_u constant. In this context, the interesting case is one where the multi-affiliates straddle the divide in returns to ability (i.e. $\widehat{a}^C < a_s < \widehat{a}^I$), since these individuals may experience either benefiting from or being "left behind" by structural economic change.

For analytical simplicity, we focus on a baseline technology that is skill-unbiased: $\beta_s = \beta_u = \beta$.[20] Setting $\widehat{U}^I = \widehat{U}^M$ and solving for $a_i = \widehat{a}^I$, we obtain the size of those who adopt some degree of communitarianism (multi-affiliates included):

$$\widehat{a}^I = \frac{\varepsilon}{\varepsilon - \pi} - \sqrt{\frac{\varepsilon\pi}{(\varepsilon - \pi)^2} - \frac{2\phi\alpha\sigma^I}{\beta\sigma^C\left(\sigma^I - (1-\phi)\right)(\varepsilon - \pi)}} \tag{9}$$

and setting $\widehat{U}^M = \widehat{U}^C$ and solving for $a_i = \widehat{a}^C$, we obtain the size of the purely communitarian group:[21]

$$\widehat{a}^C = \frac{\varepsilon}{\varepsilon - \pi} - \sqrt{\frac{\varepsilon\pi}{(\varepsilon - \pi)^2} - \frac{2\left(\sigma^C - \phi\right)\alpha\sigma^I}{\beta\sigma^C(1-\phi)(\varepsilon - \pi)}}. \tag{10}$$

The equilibrium distribution of values in society can be seen in Figure 1.

The more numerous is the M group, the more harmonious is the society, since this group embraces both value systems. However skill-biased technological change reduces the size of the M group. As noted, we represent skill-biased technical change by a rise β_s, holding β_u constant.

Proposition 2: The Effect of Skill-Biased Growth on Social Fragmentation *In response to skill-biased growth (represented as a rise in β_s, holding β_u constant), the individualistic and communitarian groups both increase at the expense of the multi-affiliated group.*

Proof *A rise in β_s, holding β_u constant, increases the size of the individualistic group*:

$$\left.\frac{d\widehat{a}^I}{d\beta_s}\right|_{\beta_s=\beta_u=\beta} = -\frac{\left(\sigma^I - (1-\phi)\right)(2 + a_s)\, a_s\beta\pi\sigma^C + 2\phi\alpha\sigma^I}{2\beta\sqrt{\beta\sigma^C\left(\sigma^I - (1-\phi)\right)\left(\left(\sigma^I - (1-\phi)\right)\beta\varepsilon\pi\sigma^C - 2\alpha\phi\sigma^I(\varepsilon - \pi)\right)}} < 0 \tag{11}$$

[20] This assumption is made to ease the analytical exposition. All results follow when the baseline technology is already skill-biased. Please refer to the appendix.

[21] It can be shown that our assumptions are sufficient for $\widehat{a}^C < \widehat{a}^I$.

Figure 2: The effect of an increase in socioeconomic inequality.

and also increases the size of the communitarian group:

$$\left.\frac{d\widehat{a}^C}{d\beta_s}\right|_{\beta_s=\beta_u=\beta} = \frac{(1-a_s)(3+a_s)(1-\phi)\sigma^C\varepsilon}{2\sqrt{\beta\sigma^C(1-\phi)(\beta\sigma^C(1-\phi)\varepsilon\pi - 2\alpha\sigma^I(\sigma^C-\phi)(\varepsilon-\pi))}} > 0. \tag{12}$$

Figure 2 summarises Proposition 2. In other words, skill-biased growth leads more people to adopt the extreme moral and ideological positions and thereby leads to a hollowing out of the tolerant middle ground.[22] The political consequences of this social fragmentation are documented by Han (2016): as income inequality rises, support for radical right-wing parties goes up among the poor but falls among the wealthy in European countries.

Two phenomena are responsible for these results. First, note that the outcomes from the communitarian pursuits are clearly more egalitarian than the outcomes from the individualistic pursuits. This is the reason why skill-biased technological progress induces the relatively high-skilled multi-affiliated citizens to become individualists: they gain more from an individualistic identity (which enables them to reap the full benefits of relatively high status) than from a multi-affiliated identity (which requires them to relinquish some of the gains from high status in favour of the egalitarian benefits from communitarian pursuits).

Second, note that status-seeking pursuits generate negative consumption externalities (i.e., one person's rise in status comes at the expense of another person's fall in status) whereas communitarian pursuits do not. This the reason why the relatively low-skilled multi-affiliated citizens to become communitarians: they can avoid their loss of status by switching from a multi-affiliated identity (in which status concerns are taken into account) to a communitarian identity (in which status concerns are ignored).[23]

As a result, society becomes more polarised, in the sense that there are fewer citizens who pursue both communitarian and individualistic pursuits (i.e. fewer multi-affiliates). As citizens stop sharing common objectives, the political process underlying economic policy making becomes more conflictual, as shown below.

5 Policy Implications

We now consider the implications of skill-biased growth for "closed" policies. Recall that closed policies have been characterised as "protectionist-nationalist", where protectionism destroys productivity and compresses income differentials, while nationalism promotes the benefits of belonging to a community.

[22] The result of Eq. 11 wherein the elite "pull away" from the rest of the population, socially and economically, is mirrored in the model of Collier (2019). Collier's model does not however predict the effect of increased communitarianism by the left-behind shown in Eq. 12.

[23] This transition may not be immediate. Poutvaara and Steinhardt (2018) show that shifting support to far right parties across European countries is associated with bitterness about voters' economic situation.

When skill-biased growth widens economic and social inequality, it becomes worthwhile for the underprivileged to favour protectionist-nationalist policies, even if these policies make everyone in the economy (economically) worse off. The reason is that people are concerned not only with their economic prosperity, but also their social prosperity. Nationalist policies raise the benefits from community affiliation and this rise in social benefits may be sufficiently large for the underprivileged individuals to warrant the sacrifice in terms of lower consumption (due to the destruction of productivity from the protectionist policies). Furthermore, the protectionist policies reduce status differences and thereby improve the status anxiety (the aversion to low status) of the underprivileged.

Specifically, protectionist-nationalist policies are represented as having two components: (i) The protectionist component reduces all agents' productivity β_j by a factor of $1-\tau>0$, where τ represents that magnitude of the productivity-destruction effect:

$$x_i = (1-\tau)\,\beta_j\,(1+a_i) \qquad \forall i,j. \tag{13}$$

(ii) The nationalist component raises the utility from communitarian activities:

$$\frac{d\alpha}{d\tau} = \delta.$$

For example, nationalism may involve activities such as "saluting the flag", which raises the utility from the nationalistic club good by proportion α.

Under such a closed policy, the boundary of the individualistic group becomes:

$$\widehat{a}^I = \frac{\varepsilon}{\varepsilon-\pi} - \sqrt{\frac{\varepsilon\pi}{(\varepsilon-\pi)^2} - \frac{2\phi\alpha\sigma^I}{\beta\sigma^C\,(1-\tau)\,(\sigma^I-(1-\phi))\,(\varepsilon-\pi)}} \tag{14}$$

while the boundary of the communitarian group becomes

$$\widehat{a}^C = \frac{\varepsilon}{\varepsilon-\pi} - \sqrt{\frac{\varepsilon\pi}{(\varepsilon-\pi)^2} - \frac{2\,(\sigma^C-\phi)\,\alpha\sigma^I}{\beta\sigma^C\,(1-\tau)\,(1-\phi)\,(\varepsilon-\pi)}}. \tag{15}$$

Note that both $\widehat{a}^I$ and $\widehat{a}^C$ rise unambiguously with protectionism τ.

In order to assess who has an interest in voting for the protectionist component of the policy, we examine how the utility of multi-affiliates responds to the policy:

$$\frac{dU_i^M}{d\tau} = \frac{1}{2\sigma^I}\,(1-\phi)\left(\beta_s\left(a_i^2\,(\varepsilon-\pi)+(1-2a_i)\,\varepsilon\right) - a_s\,(2+a_s)\,(\beta_s-\beta_u)\,\pi\right) + \frac{\delta\phi}{\sigma^C}. \tag{16}$$

For the marginal protectionist $\widetilde{a}$ – the person who is indifferent between the presence and absence of the

protectionist policy – this derivative is zero:

$$\left.\frac{dU_i^M}{d\tau}\right|_{a_i=\widetilde{a}} = \frac{1}{2\sigma^I}(1-\phi)\left(\beta_s\left(\widetilde{a}^2(\varepsilon-\pi)+(1-2\widetilde{a})\varepsilon\right)-a_s(2+a_s)(\beta_s-\beta_u)\pi\right)+\frac{\delta\phi}{\sigma^C}=0. \tag{17}$$

Note that the benefit of the policy to multi-affiliates falls with their ability (i.e. $dU_i^M/d\tau$ falls with a_i):

$$\frac{d^2U_i^M}{d\tau da_i} = -\frac{\beta_s}{\sigma^I}(1-\phi)\left((1-a_i)\varepsilon+a_i\pi\right)<0. \tag{18}$$

This means that all multi-affiliated agents with abilities lower than the marginal protectionist support the protectionist policy.

Setting $dU_i^M/d\tau=0$ and solving for a_i yields the cutoff ability level below which the multi-affiliates vote for protectionism and above which they vote against it:

$$\widetilde{a} = \frac{\varepsilon}{\varepsilon-\pi} - \sqrt{\frac{\varepsilon\pi}{(\varepsilon-\pi)^2}-\frac{2\delta\phi\sigma^I}{\beta\sigma(1-\phi)(\varepsilon-\pi)}}, \tag{19}$$

The multi-affiliates face the following tradeoff in the effects of the protectionist-nationalist policy. First, the protectionist policy reduces their status anxiety by $\frac{\tau}{2}\beta\left(a_i^2(\varepsilon-\pi)+(1-2a_i)\varepsilon\right)$. Second, it increases the return from sociocentric values by $\delta\tau\alpha$. And lastly, it reduces their utility from non-positional consumption by τa_i. For the marginal multi-affiliate voter (Eq. 19), the sum of the first two effects are equal to third, as indicated by Eq. 17.

For multi-affiliates with a lower ability level than that of the marginal voter, the first two effects do indeed dominate the third, and thus they support the protectionist-nationalist policy. For those of higher ability than the marginal voter, the third effect dominates the first two, and thus they oppose the policy.

The nationalistic component of the policy is required to retain the support of the communitarians. In the absence of the nationalistic component, the communitarians would be made economically worse off by the productivity destruction from protectionism, without participating in the advantages deriving from lower status anxiety (since the communitarians are assumed not to care about status). In particular, the nationalistic component raises the return to sociocentric values by $\delta\tau\alpha$. On the other hand, the protectionist component reduces utility from non-positional consumption by τa_i. In order for the communitarians to support the protectionist-nationalist policy, the increase in the return to sociocentric values needs to exceed the reduction in non-positional consumption for the highest-ability communitarian (who suffers the greatest loss of utility from the protectionist policy): $\delta\alpha > \widehat{a}^C$.

On this account, the cutoff value $\widetilde{a}$ – comprising both communitarians and low-ability multi-affiliates – is the size of the group that supports the protectionist-nationalist policy.[24]

[24] Note that $\widehat{a}^I-\widetilde{a} = \sqrt{\frac{\varepsilon\pi}{(\varepsilon-\pi)^2}-\frac{2\delta\phi\sigma^I}{\beta\sigma^C(1-\tau)(1-\phi)(\varepsilon-\pi)}}-\sqrt{\frac{\varepsilon\pi}{(\varepsilon-\pi)^2}-\frac{2\phi\alpha\sigma^I}{\beta\sigma^C(1-\tau)\left(\sigma^I-(1-\phi)\right)(\varepsilon-\pi)}} > 0$ so long as $\alpha > \delta\left(\sigma^I-(1-\phi)\right)/(1-\phi)$ (i.e. the policy is sufficiently inefficient).

Next, we investigate how skill-biased growth affects the support for protectionist-nationalist policies. As income grows for those at the top of the income distribution, holding fixed the low-end multi-affiliate's productivity β_u, status anxiety among the low-ability multi-affiliates increases, and thus more multi-affiliates become willing to support the policy. This insight is formalised in the following proposition.

Proposition 3: Skill-biased Growth and Protectionist-Nationalist Policies *The size of the coalition voting for the protectionist policy grows in response to skill-biased technological progress (i.e., β_s rises while β_u remains unchanged).*

Proof

$$\left.\frac{d\widetilde{a}}{d\beta_s}\right|_{\beta_s=\beta_u=\beta} = \frac{2\delta\phi\sigma^I + a_s\left(2+a_s\right)\left(1-\phi\right)\beta\pi\sigma^C}{2\beta\sqrt{\beta\sigma^C\left(1-\phi\right)\left(\beta\sigma^C\varepsilon\left(1-\phi\right)\pi - 2\delta\phi\sigma^I\left(\varepsilon-\pi\right)\right)}} > 0. \tag{20}$$

In words, starting from an initial skill-unbiased distribution of abilities, skill-biased technological progress increases the number of people favouring protectionism. It does so by promoting social fragmentation (i.e. generating polarised values – communitarianism and individualism – at the expense of multi-affiliatedness).

As the supporters of protectionism become more numerous, it becomes more likely that a democratically elected government will pursue protectionist policies, even though these policies reduce productivity. Policies that make everyone materially worse off are chosen by communitarians and multi-affiliates for a simple reason. Their material standard of living is not the only source of their wellbeing. Rather, they also derive wellbeing from social pursuits and these pursuits are impeded by skill-biased technological change, on account of its promotion of economic inequality.

In focusing exclusively on wellbeing arising from material goods and services, conventional economic theory overlooks this rationale for protectionism. By extending our analysis to include both individualistic market activities and communitarian non-market activities, it becomes possible to recognise two effects of skill-biased technological change: (i) a rise in individualistic returns, generated by a rise in material living standards and (ii) a rise in social fragmentation, associated with lower communitarian returns and lower status for the low-ability individuals. The attractiveness of protectionism for the disadvantaged segment of the population lies in its promotion of communitarian goals, even if that comes at the expense of a reduced material living standard. Furthermore, the productivity-destroying policy acts to prevent some social fragmentation by making fewer citizens adopt an individualistic identity,[25] though more also adopt a purely communitarian identity.[26]

[25] This may be seen by

$$d\widehat{a}^I/d\tau = \frac{\phi\sigma^I\left(\delta+\alpha\right)}{\left(1-\tau\right)^{3/2}\sqrt{\beta\sigma^C\left(\sigma^I-\left(1-\phi\right)\right)\left(\beta\varepsilon\pi\sigma^C\left(1-\tau\right)\left(\sigma^I-\left(1-\phi\right)\right)-2\phi\alpha\sigma^I\left(\varepsilon-\pi\right)\right)}} > 0.$$

[26] Similarly

$$d\widehat{a}^C/d\tau = \frac{\sigma^I\left(\sigma^C-\phi\right)\left(\delta+\alpha\right)}{\left(1-\tau\right)^{3/2}\sqrt{\beta\sigma^C\left(1-\phi\right)\left(\beta\varepsilon\pi\sigma^C\left(1-\phi\right)\left(1-\tau\right)-2\alpha\sigma^I\left(\sigma^C-\phi\right)\left(\varepsilon-\pi\right)\right)}} > 0.$$

Figure 3: The effect of skill-biased growth on the policy & the policy's effect on identities.

Naturally, our model not meant to be interpreted as an argument for protectionism in the presence of skill-biased technological change. Instead, the extended purview of our analysis points to the need for innovation, education and training policies that reduce the skill bias of technological change. This can be done either by improving the skills of the least advantaged people, enabling them better to take advantage of technological advances, or by shaping the nature of technological change itself, through subsidising innovations that improve the lot of the disadvantaged.

6 Concluding Remarks

While conventional economic theory rests on consumption-oriented utilitarian values, these are not the only values that people cherish. Our analysis has focused on one important additional value: loyalty to one's tribe. In the latter, consumption flowing to oneself is not essential. Instead, sources of group esteem are important, such as displays of national or religious power, even if they reduce material wealth (as is frequently the case under trade war or military conflict).

Our model highlights a new channel whereby economic inequality hampers economic growth. Rising inequality leads to rising social fragmentation, measured by the increasing polarisation of values. The elite progressively abandon communitarian goals and focus increasingly on individualistic material goals. These developments leave the underprivileged worse off in two respects: first, they fall progressively behind in the competition for positional goods and, second, their public goods associated with social allegiances fall, due to the exodus of the privileged from community pursuits. On this account, the elite's rising preoccupation with individualistic material goals is matched by a rising preoccupation of the underprivileged with communitarian goals.

Moral fragmentation deserves attention in economic analysis since, as our model indicates, it can have both economic sources (e.g. globalisation and innovation) and economic consequences (e.g. protectionism).[27] The ideological divides associated with the moral divides are also apparent in the rebirth of strident nationalist and fascist political movements in many countries around the world. Furthermore, the moral divides are evident in the political conflicts concerning gender issues and religious fundamentalism, each of which have important economic consequences. Our analysis also indicates that this moral fragmentation is potentially important for understanding a variety of economic problems, including inequalities, the political economy of populism, and the decline of the welfare state. Finally, the conflict between rival identities associated with this moral fragmentation has had profound implications for public

[27] These economic and cultural shifts often fed on and reinforced each other. One example is the case of Jewish emancipation in nineteenth-century Europe. Carvalho and Koyama (2016) explain how new economic opportunities polarised communities, some of whom integrated into Gentile society while others adopted an increasingly strict religious orientation.

policy and governance – including the underclass's mistrust of the governing elites; the elite's paternalism and their falling willingness to support welfare services for the poor; and the declining willingness of citizens to contribute voluntarily to public goods and common pool resources.

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Appendix

We now relax the assumption from Section 4 that the baseline technology is skill-unbiased ($\beta_u = \beta_s = \beta$) with the assumption that the baseline technology may be skill-biased. Here are expressed the general cases of the important equations with this assumption relaxed. Firstly, the boundary between the multi-affiliated identity group and the individualistic identity group, defined by the marginal individual $\widehat{a}^I$ as expressed in Equation 9:

$$\widehat{a}^I = \frac{\varepsilon}{\varepsilon - \pi} - \sqrt{\frac{\varepsilon\pi}{(\varepsilon-\pi)^2} + \frac{a_s\left(2+a_s\right)\left(\beta_s - \beta_u\right)\pi}{\beta_s\left(\varepsilon-\pi\right)} - \frac{2\phi\alpha\sigma^I}{\beta_s\sigma^C\left(\sigma^I-(1-\phi)\right)\left(\varepsilon-\pi\right)}}.$$

We can similarly show the boundary between the multi-affiliated identity group and the communitarian identity group (and correspondingly the size of the communitarian group), defined by the marginal individual $\widehat{a}^C$ as expressed in Equation 10:

$$\widehat{a}^C = \frac{\varepsilon}{\varepsilon - \pi} - \sqrt{\frac{\varepsilon\pi}{(\varepsilon-\pi)^2} - \frac{\left(1+a_s\right)\left(3+a_s\right)\left(\beta_s - \beta_u\right)\varepsilon}{\beta_u\left(\varepsilon-\pi\right)} - \frac{2\sigma^I\left(\sigma^C-\phi\right)\alpha}{\beta_u\sigma^C\left(1-\phi\right)\left(\varepsilon-\pi\right)}}.$$

Next, we show how the marginal individual $\widehat{a}^I$ is now less skilled when skill-biased income growth occurs, represented by an increase in β_s holding β_u constant, as seen in Equation 11:

$$\frac{d\widehat{a}^I}{d\beta_s} = -\frac{\left(\sigma^I-(1-\phi)\right)\left(2+a_s\right)a_s\beta_u\pi\sigma^C + 2\phi\alpha\sigma^I}{2\beta_s\sqrt{\beta_s\sigma^C\left(\sigma^I-(1-\phi)\right)\left(\left(\sigma^I-(1-\phi)\right)\left(\beta_s\varepsilon\pi\sigma^C + \left(\varepsilon-\pi\right)\pi a_s\left(2+a_s\right)\left(\beta_s-\beta_u\right)\right) - 2\alpha\phi\sigma^I\left(\varepsilon-\pi\right)\right)}}$$
$$< 0.$$

This means that more of the skilled population "pulls away" from communitarian values. Likewise, the marginal individual $\widehat{a}^C$ is now more skilled when skill-biased income growth occurs, as seen in Equation 12:

$$\frac{d\widehat{a}^C}{d\beta_s} = \frac{\left(1-a_s\right)\left(3+a_s\right)\left(1-\phi\right)\sigma^C\varepsilon}{2\sqrt{\beta_u\sigma^C\left(1-\phi\right)\left(\beta_u\sigma^C\left(1-\phi\right)\varepsilon\pi - \left(\varepsilon-\pi\right)\varepsilon\left(1-a_s\right)\left(3+a_s\right)\left(1-\phi\right)\left(\beta_s-\beta_u\right) - 2\alpha\sigma^I\left(\sigma^C-\phi\right)\left(\varepsilon-\pi\right)\right)}}$$
$$> 0,$$

i.e. more of the upper end of the unskilled population gravitates towards pure communitarianism as they are "left behind". The consequences for political economy are seen in the change in the marginal voter $\widetilde{a}$, who is just indifferent to adopting the productivity-destroying policy, given by Equation 19:

$$\widetilde{a} = \frac{\varepsilon}{\varepsilon - \pi} - \sqrt{\frac{\varepsilon\pi}{(\varepsilon-\pi)^2} - \frac{a_s\left(2+a_s\right)\left(\beta_s - \beta_u\right)\pi}{\beta_s\left(\varepsilon-\pi\right)} - \frac{2\delta\phi\sigma^I}{\beta_s\sigma^C\left(1-\phi\right)\left(\varepsilon-\pi\right)}}.$$

Since all with ability $a_i < \widetilde{a}$ are predicted to vote for this policy, we can see how the size of the political constituency for productivity-destroying policies grows with skill-biased technological change from Equation 20:

$$\frac{d\widetilde{a}}{d\beta_s} = \frac{2\delta\phi\sigma^I + a_s\left(2 + a_s\right)\left(1-\phi\right)\beta_u\pi\sigma^C}{2\beta_s\sqrt{\beta_s\sigma^C\left(1-\phi\right)\left(\left(1-\phi\right)\pi\left(\beta_s\sigma^C\varepsilon + a_s\left(2+a_s\right)\left(\beta_s-\beta_u\right)\left(\varepsilon-\pi\right)\right) - 2\delta\phi\sigma^I\left(\varepsilon-\pi\right)\right)}} > 0.$$