

# The Role of Passionate Individuals in Economic Development

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## Abstract

Insights from “passionate individuals” theory by Gumilev (2005(1978)) are used for a growth theory associating development with intrinsic motivation to show prosocial effort (i.e. make “cultural contributions”). Individuals derive utility from consumption and from appreciation of cultural contribution by future generations. While making a contribution, one appreciates past contributions, causing multiple steady states. In *survival* steady state, individuals expect no appreciation of their contribution, and show no effort to achieve it. In *passionate* steady state, individuals expect appreciation of contribution and allocate effort towards it, also appreciate past contributions. The theory is contrasted with sociology, economic history, cultural transmission theory literature.

*Keywords:* passionate individuals, self-expression values, poverty trap, economic growth

*JEL codes:* O11, O49, Z13

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A monument, unforged, I for myself erected.  
A common path to it will not be ever lost,  
And its unheedful head reigns higher than  
respected,  
The known Alexandrian Post.  
I shall not die a whole, but in the tokened lyre  
My soul will outlive my flesh and won't decay.  
I will be honored till in underlunar sphere  
Lives my like who has much to say.

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Alexander Pushkin, *Exegi Monumentum*.

Translation by Boris Leyvi

## 1. Introduction

Many political, social and technological innovations have been made without any apparent material gain for the innovators. The United States Declaration of Independence was not purchased in a market for declarations, but was donated by volunteers who had to risk their freedom or even lives. There is no evidence that John Muir, a leading Californian conservationist, made any commercial profit on his lifelong effort. The Soviet space program was operated by employees with limited material incentives,<sup>2</sup> but has, in many instances, outperformed the American space program which had outsourced many tasks to for-profit private companies.

At the same time, members of societies with inefficient/ underdeveloped social orders are sometimes described as following consumption-based incentives too closely. Banfield (1958), for example, views the roots of Southern Italy underdevelopment in the “amoral familism” of the local population, which he defines as the pursuit of the following objective function:

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<sup>2</sup>Indeed, being too rich was a crime in the Soviet Union.

Maximize the material, short-run advantage of the nuclear family; assume that all others will do likewise.

The above definition seems to be a near-perfect match to the human objectives assumed by mainstream economics. Banfield also emphasizes that in the society of “amoral familists,” any large-scale project of social importance, such as a space flight or a national park, is bound to fail, as it requires a large amount of non-material and unselfish (i.e. not leading to increased well-being of own family) motivation. Moreover, a person who undertakes a project of social importance is likely to face distrust and scepticism of the community members (page 20):

When an interviewer explained to a young teacher [what] a “public-spirited” person is..., the teacher said: “No one in town is animated by the desire to do good for all of the population. Even if sometimes there is someone apparently animated by this desire, in reality he is interested in his own welfare and he does his own business.”

In this paper, I propose a formal growth theory that states that societies become more economically developed when their members depart from their biological instincts of maximizing family well-being, and when they invest their time and effort into solving problems that have social value without the aim to benefit own family. Much of the intuition and terminology of the proposed theory is borrowed from a popular among Russian scholars theory of *passionate individuals* by the historian Lev Gumilev (2005(1978)), relevant parts of which are described in the paragraphs that follow.

### *1.1. Gumilev’s theory of passionate individuals*

Gumilev stated that individuals may differ in the extent to which they are passionate, that is, in the amount of their intrinsic motivation and their ability to change the environment

around them. Gumilev has proposed several levels of passionate behavior, with the highest being the willingness to achieve a goal even at the cost of one's life and/or lives of other people; as examples of such behavior, he proposes Alexander the Great, Napoleon, and Jeanne d'Arc who seemingly were not particularly concerned about own physical well-being. The lowest level of passionate behavior, or "zero" level, according to Gumilev, is the level of individuals who fully accommodate to the existing environment and show no desire to change it; the "amoral familism" described by Banfield (1958) is a good illustration.

Gumilev states that the proportion of individuals in a particular society showing passionate effort may differ considerably, both across societies and over time. He also emphasizes that the amount of passionate effort in a particular society may increase considerably over short periods of time and for no apparent reason, which he refers to as the *passionate push*.<sup>3</sup> The passionate push may lead to major changes in the political and/or religious institutions of the respective societies; it can may also lead to long-distance migrations and military conquests. European Renaissance, the Arabic conquests in the 7th and 8th centuries, ancient Greece, and, in fact, all other remarkable events in the human history are viewed by Gumilev as instances of the passionate push. All these are also examples of rapid increases in the degree of cooperation and coordination between people, leading to improvements in the levels of social development.

The theory of passionate individuals also suggests that, while their presence may be transitory, the social impact of their behavior is often long-lasting or even permanent:

It is indeed true that passionate individuals are always condemned. But if they always perished without achieving anything, we would still kill infants for religious sacrifice,... eat our dead enemies, and treat diseases by means of witchery.

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<sup>3</sup>Gumilev also stressed that the passionate push often occurs in several societies simultaneously; he also theorized about how the passionate push decays over time. These ideas are not pursued in the current research.

There would be no Pyramids, no Pantheon, no “discovery” of America, no discovery of gravity laws and no space flight... The Earth would be populated not by French or English or Russians, but by Sumerians, Picts and other well-forgotten ethnicities.<sup>4</sup>

In other words, Gumilev’s view of social development and economic growth is that both are driven by the efforts of passionate individuals.

## *1.2. Relationship to modern academic literature*

Gumilev’s theory has been criticized by peers for being purely descriptive and lacking modern methods of analysis. Yet, in this paper I argue that Gumilev’s theory has many points in common with more recent theories which were put forth by scholars from various disciplines, and which are based on modern empirical methods.

### *1.2.1. Sociology*

While Economists maintain that human objectives are defined by material needs, modern sociology argues that human values are drifting away from pure materialism. In a series of publications (e.g., Inglehart and Baker, 2000; Inglehart and Welzel, 2005), Ronald Inglehart and coauthors argue that values in the most developed nations are increasingly defined by *postmaterialism* and its empirical measure, *self-expression*, as opposed by materialism and survival, respectively. People with postmaterialist/self-expression values are much more likely to be concerned about the environment outside of their homes; when searching for a job, they value not only income and safety but also the feeling of accomplishment; they are more likely to participate in civic life. As Inglehart and Welzel (2005, p.33) put it:

People still eat, but a growing component of food’s value is determined by its nonmaterial aspects... The publics of postindustrial societies place growing em-

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<sup>4</sup>Translation is mine.

phasis on “political consumerism,” such as boycotting goods whose production violates ecological or ethical standards.

I argue that the Gumilev’s concept of passionate individuals/effort is fairly well-aligned with the concept of postmaterialist/self-expression values and incentives: the above example of self-expression could be used by Gumilev as an example of passionate behavior. Unlike Gumilev’s purely descriptive theory, the self-expression values are very well-documented and are available for empirical tests.

Inglehart and Baker (2000) also discuss the relationship between values and income: controlling for the share of the workforce in the service sector (which they believe to be the major predictor of self-expression values), they find a strong and robust correlation between self-expression and wealth.

Whether self-expression is a cause or a consequence of growth? A well-known hierarchy of needs (Maslow, 1943) suggests that people desire self-expression after the material needs have been fulfilled, thus values are a consequence of growth. Inglehart and Welzel (2005, p.45), however, counterargue that the enrichment of Persian Gulf societies through oil exports did not alter their values. On the contrary, the ancient Greek society did not make use of electricity, combustion engine and railroads, and thus must have been very poor by modern standards, but was nevertheless (anecdotally) high on self-expression. Thus, we conclude, the causal link from wealth to values is not that obvious, and the reverse causation, from values to growth, is also possible. While a direct empirical proof of this hypothesis is (to the best of my knowledge) nonexistent, Algan and Cahuc (2010) establish empirically the causal effect from trust (arguably, closely related to self-expression) to development.

### *1.2.2. Economic history*

Gumilev did not address the most studied by the Economists instance of economic change, the British industrial revolution. However, a recent study by Mokyr (2010) argues that the

industrial revolution could have occurred due to changes in people's beliefs and values, in particular, due to popularization of the Enlightenment movement in Great Britain.

Mokyr also emphasizes that many of the innovators of the industrial revolution era were motivated not by an expectation of material wealth, but by expectation of public appreciation (p. 90):

Open science... was run by ambitious and hard-working people who had clear objectives in mind. Yet the standard pecuniary incentive system was supplemented by a more complex one that included peer recognition and the sheer satisfaction of being able to do what one desires... Scientists who discovered matters of significant insight to industry, such as Count Rumford, Joseph Priestley, or Humphry Davy, usually wanted credit, not profit.

Thus, Mokyr's insights about the motives of the industrial revolution contributors are very similar to Gumilev's insights about passionate individuals; the industrial revolution itself may be viewed as another instance of the passionate push.

### *1.2.3. Cultural transmission*

Newson and Richerson (2009) introduce the modern/traditional values tradeoff, which echoes the self-expression/survival tradeoff proposed by Inglehart and Baker (2000). According to Newson and Richerson (2009), individuals with traditional values are those who aim to maximize own genetic fitness, i.e. well-being of themselves and their family members, and allocate all available resources towards that goal. People with modern values depart from standard theoretical-biology objectives and allocate part of available resources toward achieving more abstract goals. While the authors do not specify the precise objectives of the modern people (only that they have departed from pure genetic fitness maximization), they do theorize about the cause of modernization - namely, reduced interaction with relatives and intensified interaction with non-relatives. Such a change in the pattern of social

interactions changes the flow of cultural transmission, such that young individuals pick up the cultural traits of not only close relatives but also of other people. In such new environment, new cultural traits that emphasize not only genetic success (and closely related family well-being), but also other things, may evolve. Thus, in the view of Newson and Richerson (2009), reduced costs of cultural transmission between non-relatives may become the cause of modernization.

### *1.3. Relationship to altruism*

Economists have developed one major departure from the selfish-consumption-maximizing *Homo Economicus* paradigm, namely, the theory of altruistic behavior (see Stark (1999) for a seminal review). Some studies have related altruism with development, e.g. Tabellini (2008) explains the variation in social development across societies and regions by heterogenous propensity of individuals to show altruism towards (i.e. cooperate with) strangers.

The theory developed by this paper, however, does *not* fall into the category of altruism. Altruism is concern about material well-being of individuals other than oneself; passionate individuals, albeit giving up part of own material well-being, do not necessarily aim to improve that of specific other individuals. A donation to a charity fund is an act of altruism, while an effort to achieve a space flight is not. Thus, the proposed concept of passionate individuals should be viewed as a separate category, to the best of my knowledge not discussed in the Economics literature.

### *1.4. Modeling passionate individuals and growth*

The idea of the passionate push seems to be closely related, both in its labeling and content, to the theory of the *big push* originally proposed by Rosenstein-Rodan (1943) and formalized by Murphy et al. (1989). According to the theory, an economic system may rest in two self-sustainable equilibria – less efficient “traditional” and a more efficient “modern;” a considerable external effort is required to move the system from one equilibrium to another.

A logical extension of this intuition is that observed changes in the economic system may be rare but large and long-lasting, which is also true about Gumilev's intuition of the "passionate push". In the formal theory outlined below, I borrow the intuition of multiple equilibria to model Gumilev's insights about the roots of development and underdevelopment.

Having decided that passionate individuals do not follow conventional genetic- or consumption-based incentives, for a formal theory of passionate behavior, we need to make credible assumptions about their objectives. Gumilev's own insights about the microfoundations of the such behavior, that passionate individuals are those willing to "change the environment," are somewhat vague; a more "rigorous" formulation of their objectives is required. For that, I refer to another theory, which has been seemingly developed independently from that of Gumilev's, but which overlaps in many respects.

In the Chapter 11 of his book, Dawkins (1976) introduces the concept of the *meme*, or a "virus of the mind," which may be passed from one human brain to another, much like genes are copied from one living organism to the next. Blackmore (2000) argues that the memes may alter the behavior of their human hosts in such a way that humans spread their memes (or maximize their "memetic success") instead of maximizing their genetic success. As an example of "memetic" behavior, Dawkins (1976) mentions Socrates who insisted on his philosophic views even at the cost of his life. As Dawkins states, "Socrates may or may not have a gene or two alive in the world today, ... [but his memes] are still going strong". In other words, Socrates' decision to choose death over life was rational if he derived utility not only from material well-being, but also from "cultural success" defined as the extent to which his efforts became known/understood by subsequent generations. This intuition is used in modeling individual objectives in the analysis that follows.

The theory of incentives proposed by Dawkins echoes the view of Mokyr (2010) that scientific pioneers were motivated by "credit, not profit". A popular poem by Alexander Pushkin used as the epigraph to this paper also points to the same incentives.

It should be emphasized that in this paper, I do *not* claim the existence of the memes which “infect” human brain and alter human behavior; I adhere to a more traditional view of humans as rational decision makers. The innovation of this paper, relative to conventional models of economic behavior, is in the assumption of what exactly humans are willing to achieve.

## 2. The model

### 2.1. Setup

Consider an infinite-time-horizon dynamic environment, in which each of the discrete generations is populated by a continuum of individuals. Individuals live for one period of time; the set of individuals of a generation  $t$  is labeled as  $G_t$ . The population size is constant over time, and is normalized to unity.<sup>5</sup>

Each individual  $j$  from each generation  $G_t$  is endowed with  $T$  units of time, which she divides between two types of activities: passionate effort,<sup>6</sup> labeled  $e_j$ , and survival effort  $T - e_j$ . The passionate effort is the effort to solve problems of social importance without the aim to improve own material well-being. Conducting research (especially by those whose income is fixed), writing poems, making inventions, volunteering, conducting political reforms, and leading armies could serve as examples of passionate effort. The survival effort is the effort to solve problems of family importance, such as procuring food, wealth, and shelter for oneself and one’s family. Organizing a public fund is an example of passionate effort; stripping from a public fund is an example of survival effort. Note that effort in this paper is measured in the units of time.

The two types of effort result in two types of output. The passionate effort results in

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<sup>5</sup>There is no interaction between individuals within a given generation, hence the population size technically does not matter. One could assume that each generation is populated by only one individual, or that there is exponential population growth.

<sup>6</sup>Gumilev used the term “passionarnoye napryazhenie,” which is a close match to “passionate effort”.

a *cultural contribution*  $c_j$ , measured in terms of the number of research articles or poems written, inventions or political reforms made; in the language of Alexander Pushkin,  $c_j$  is the height of the “unforged monument to oneself” erected by the contributor. The survival effort results in *consumption*  $x_j$ , equivalent to that in conventional economic models. The amount of consumption produced is the product of survival effort and the *productivity*  $A_t$ :

$$x_j = A_t(T - e_j), \forall j \in G_t. \quad (1)$$

The production function of the cultural contribution is the following:

$$c_j \equiv a_j e_j, \forall j \in G_t, \quad (2)$$

where  $a_j \geq 0$  is the ability, randomly drawn from a distribution with a probability measure  $P(\cdot)$ .<sup>7</sup> As a byproduct of the process of production of cultural contribution, the contributor pays a *tribute*  $y_{ij}$  to cultural contributions of the past:

$$y_{ij} = \frac{c(i)c(j)}{\tau}, \forall i \in G_{t-1}, \quad (3)$$

where  $\tau$  is the “cost” of paying a tribute to past contributions, by analogy with iceberg transport costs in the international trade literature. Intuitively, a greater  $\tau$  reflects a greater difficulty of access to knowledge about past contributors. We assume that paying tribute is part of the technological process of production of cultural contribution, and does not involve any additional time cost to the contributor. For example, Alexander Pushkin, prior to writing his poem used as the epigraph to this paper, had to pay tribute to Roman poetry

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<sup>7</sup>Not every passionate effort results in a positive cultural contribution. Hitler’s effort was indeed passionate but had catastrophic effects on European development. To account for the fact, the model could be generalized to cultural contribution being a stochastic function of passionate effort.

in general and to Horace in particular. The tribute increases proportionately with cultural contributions of both the sender of the tribute,  $j \in G_t$ , and its addressee,  $i \in G_{t-1}$ , again by analogy with the gravity model of international trade.

A more general formulation of the model may allow tributes not only to the most recent, but also to all preceding generations (indeed, Horace lived many generations before Pushkin). Such generalization however does not provide any additional insights to the conclusions of the model.

The productivity is assumed to grow exponentially with past cultural contributions:<sup>8</sup>

$$A_t \equiv \exp \left( \sum_{n=1}^{t-1} C_n \right), \quad (4)$$

where  $C_n$  is the aggregate cultural contribution by generation  $n$ :

$$C_n = \int_{i \in G_n} c_i di. \quad (5)$$

Finally, we complete the model by defining the objective function of the decision makers. It is assumed that  $j \in G_t$  derives utility from a combination of consumption  $x_j$  and expected *cultural success*, denoted  $h_j$ . The latter is the expected aggregate tribute to  $j$ 's cultural contribution by the next generation:<sup>9</sup>

$$h_j \equiv E \int_{k \in G_{t+1}} y(j, k) dk = \frac{c_j C_{t+1}^E}{\tau}, \quad (6)$$

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<sup>8</sup>Not every positive cultural contribution leads to an advancement of economic productivity, for example paintings produced during the Renaissance did not improve people's physical well-being. To account for the fact, the model can be generalized to multiple types of cultural contributions, with some of them leading to TFP growth and others being "neutral". Then, there might be multiple types of the passionate push, with some of them leading to technological growth, and others leading to development of arts.

<sup>9</sup>An alternative to the term "cultural success", motivated by Dawkins' theory of cultural transmission, is "honor", motivated by Pushkin's poem.

where superscript  $E$  denotes expectation.

Intuitively, consumption is essential for one's well-being, while cultural success is not essential because, as discussed in the introduction of this paper, members of some societies seem to be concerned only about family material well-being. We assume the following utility function capturing the above intuition:

$$u(x, h) \equiv \ln(x) + h. \quad (7)$$

## 2.2. Analyzing the model

The optimization problem of individual  $j \in G_t$ , rewriting the utility (7), can be defined as follows:

$$\max_e \sum_{n=1}^{t-1} C_n + \ln(T - e) + a_j e \frac{C_{t+1}^E}{\tau}$$

which results in the following first-order condition of optimal passionate effort,  $e(a_j, C_{t+1}^E)$ :

$$-\frac{1}{T - e(a_j, C_{t+1}^E)} + a_j \frac{C_{t+1}^E}{\tau} \begin{cases} = 0, & e(a_j, C_{t+1}^E) > 0, \\ \leq 0, & e(a_j, C_{t+1}^E) = 0. \end{cases} \quad (8)$$

Define by  $a_t^*$  the cutoff ability level, below which no passionate effort is shown:  $a_t^*(C_{t+1}^E) \equiv \frac{\tau}{TC_{t+1}^E}$ . A greater expected cultural contribution by the next generation implies a greater tribute to cultural contributions of the current generation, increasing the proportion of individuals willing to make such contribution. An easier access to knowledge about past passionate individuals (lower  $\tau$ ) also increases the proportion of individuals willing to show passionate effort and make a cultural contribution. We set  $a_t^*(0) = \infty$ , i.e. no one is willing to make a cultural contribution if the future generation is not expected to make its own contribution and thus to pay tribute to that of the current generation.

We can also express the optimal cultural contribution of  $j \in G_t$  as function of ability and

future contributions:

$$c(a_j, C_{t+1}^E) \equiv a_j e(a_j, C_{t+1}^E) = \begin{cases} 0, & a_j \leq a_t^*, \\ a_j T - \frac{\tau}{C_{t+1}^E}, & a_j > a_t^*. \end{cases}$$

Given individual rationality, perfect foresight, and full information, everyone's expectation about future cultural contributions is the same. Given this result, we can calculate the current aggregate cultural contribution as a function of expected future cultural contribution.

To do so, we define a function  $S : R_+ \rightarrow R_+$  that maps the latter into the former:

$$S(z) = \begin{cases} \int_{a \in [a_t^*(z), \infty)} adP([0, a])T - P([a_t^*(z), \infty))\frac{\tau}{z}, & z > 0 \\ 0, & z = 0. \end{cases} \quad (9)$$

Note that the function  $S$  is continuous at all points including zero. From (9), it follows that a greater anticipated cultural contribution of the next generation (weakly) increases the cultural contribution of the current generation, by both increasing the proportion of individuals making a contribution (extensive margin) and increasing the contribution of every such individual (intensive margin). The exact shape of the function  $S(\cdot)$  depends on the ability distribution,  $P(\cdot)$ . Below, we analyze two cases of special interest.

**Example 1.** *Everyone has identical ability  $a_0$ , i.e.  $P(a_0) = 1$  whereas  $P([0, a]) = P((a, \infty)) = 0$ . Then, (9) collapses to the following:*

$$S(z) = \begin{cases} 0, & a_t^*(z) \geq a_0 \iff z \leq \frac{\tau}{Ta_0}, \\ a_0 T - \frac{\tau}{z}, & z > \frac{\tau}{Ta_0}. \end{cases} \quad (10)$$

*This function is concave for  $z \in \left(\frac{\tau}{Ta_0}, \infty\right)$ .*

**Example 2.** *The ability is distributed exponentially with mean  $a_0$ , i.e.  $P([0, a]) = 1 - e^{-\frac{a}{a_0}}$ . Then, (9) is simplified to*

$$S(z) = \begin{cases} T(a_0 + a_t^*(z))e^{-\frac{a_t^*(z)}{a_0}} - \frac{\tau}{z}e^{-\frac{a_t^*(z)}{a_0}} = Ta_0 e^{-\frac{\tau}{Ta_0 z}}, & z > 0, \\ 0, & z = 0. \end{cases} \quad (11)$$

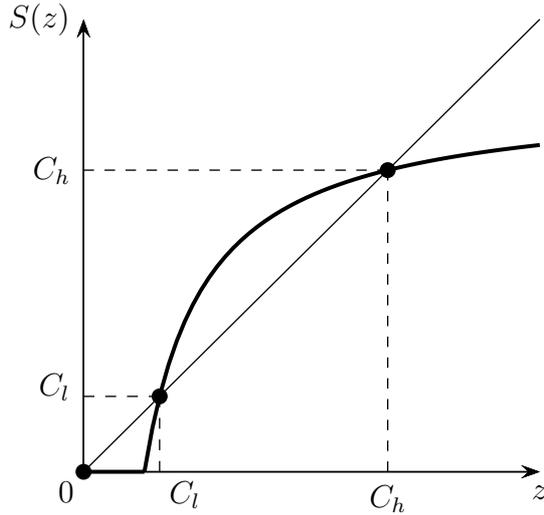


Figure 1: Fixed points, identical abilities

*This function has zero derivatives at  $z = 0$ ; the function is convex for  $z \leq \frac{\tau}{2a_0T}$ , and is concave otherwise.*

In both Example 1 and Example 2, there exist two non-zero fixed points iff  $a_0$  is sufficiently large. Specifically, in Example 1, two non-zero fixed points exist iff  $a_0 > \frac{2\tau^{\frac{1}{2}}}{T}$ , and are equal to  $C_l \equiv \frac{1}{2} \left( a_0T - \sqrt{a_0^2T^2 - 4\tau} \right)$  and  $C_h \equiv \frac{1}{2} \left( a_0T + \sqrt{a_0^2T^2 - 4\tau} \right)$ , respectively. In Example 2, no closed-form solution exists; it should be noted however that (i) for small enough  $z > 0$ , we have that  $S(z) < z$  (a corollary of the fact that  $S'(0) = 0$ ); (ii) for any given  $z$  and for large enough  $a_0$ , we have that  $S(z) > z$ ; (iii) for large enough  $z$ , we have that  $S(z) < z$  again; (iv) the behavior of the second derivative (first positive, then negative) implies that at most three fixed points exist, one of them always at zero. These properties, combined with continuity of  $S(\cdot)$ , imply existence of two non-zero fixed points provided that  $a_0$  is large enough. Figures 1 and 2 illustrate multiple steady states in both examples.

Which behaviors are likely to be observed in a steady state? Suppose the expected cultural contribution  $v$  generations ahead is equal to some  $C_{t+v}^E \geq 0$ ; we can calculate the current cultural contribution by backward induction:  $C_t = S^v(C_{t+v}^E)$ . As the planning horizon  $v$  approaches infinity, the current cultural contribution becomes  $C_t = S^\infty(C_\infty^E)$ . In

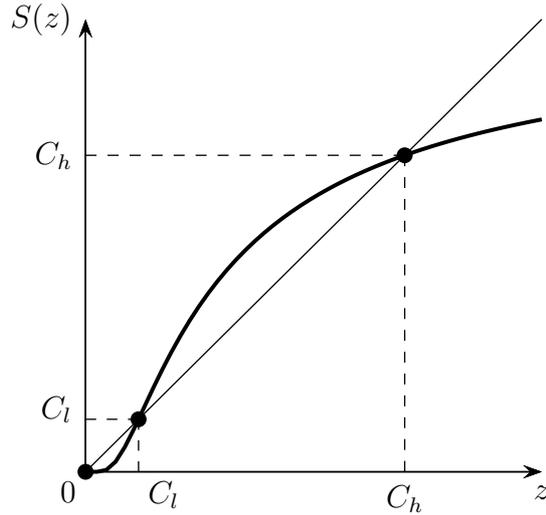


Figure 2: Fixed points, exponential ability distribution

both above examples,  $S^\infty(\cdot)$  takes one of three values:

$$S^\infty(z) = \begin{cases} 0, & z \in [0, C_l), \\ C_l, & z = C_l, \\ C_h, & z \in (C_l, \infty) \end{cases} \quad (12)$$

We refer to  $C_t = 0$  as the *survival* steady state. In this steady state, there is no social progress as individuals do not make contributions to such progress, and for this reason do not pay tribute to the contributions of the past. They do not make such contributions, and focus entirely on consumption/family affairs, because they do not expect appreciation/tribute to their own cultural contributions by the next generation.

The steady state  $C_t = C_l$  is unlikely — it is possible only if everyone believes that every subsequent generation will contribute exactly  $C_l$ . A minor change in expectations moves the economy away from this steady state.

The steady state  $C_t = C_h$  is referred to as *passionate*. In this steady state, each generation makes a positive contribution to social progress, and pays tribute to the contributions of the past. An expectation of tribute by the next generation motivates individuals to make their

own contributions.

The steady states are Pareto-ranked: since higher cultural contributions are driven by more optimistic expectations about tribute paid by the next generation, they are associated with higher well-being of the contributors. They also enhance the well-being of all future generations by permanently increasing productivity in the consumption sector.

### 3. Conclusion

The growth theory of this paper can be summarized as follows: the world changes as long as there are people that are willing to change the world, whom I label, following a historian Lev Gumilev, as passionate individuals.

Underdeveloped societies, on the other hand, are underdeveloped due to lack of passionate individuals and because the members of such societies follow primarily their genetic instinct of maximizing their family well-being.

The paper develops a formal multiple-steady-state model of passionate behavior, and discusses its empirical implications.

Which policies make the passionate push more likely? Newson and Richerson (2009) argue that departures from traditional values are due to changing patterns of cultural transmission, namely due to lower costs of interaction with large numbers of people. Inglehart and Welzel (2005) attribute the rise of self-expression values to the rise of the service sector which, arguably, implies a higher frequency of individual interaction with large numbers of other people, compared to agricultural or industrial sector, where interaction with other people is limited.

In the context of this paper, a lower cost of learning about past passionate effort,  $\tau$ , increases the best response function  $S(\cdot)$  at every point where it is positive, thereby reducing the value of  $C_l$  and increasing the value of  $C_h$ . Lower  $C_l$  implies squeezed basin of attraction of the survival steady state, and expanded basin of attraction of the passionate steady state,

thus making the “passionate push” easier to achieve. A greater value of  $C_h$  implies a bigger cultural contribution by each generation in the passionate steady state, therefore a faster growth.

A practical conclusion of this paper is that efforts and commitments to commemorate prosocial contributions, via both tangible (e.g. monuments) and intangible (e.g. honorary awards) tributes, may be growth enhancing, as they may increase incentives to make such contributions. Perhaps one should think of “optimal honor design” that would increase our understanding of how an optimally chosen system of honorary awards may enhance the amount of passionate effort of the society.

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