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TOTAL FACTOR PRODUCTIVITY AND THE INSTITUTIONAL POSSIBILITY FRONTIER: AN OUTLINE OF A LINK BETWEEN TWO THEORETICAL PERSPECTIVES ON INSTITUTIONS, CULTURE AND LONG RUN GROWTH

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TOTAL FACTOR PRODUCTIVITY AND THE INSTITUTIONAL POSSIBILITY FRONTIER: AN OUTLINE OF A LINK BETWEEN TWO THEORETICAL PERSPECTIVES ON INSTITUTIONS, CULTURE AND LONG RUN GROWTH[2]

The paper proposes an outline for the link between two theoretical perspectives on the prerequisites of high institutional quality and long run growth. One framework is based on the tradeoff between disorder and dictatorship and introduces the notion of the institutional possibility frontier, another perspective focuses upon the role of total factor productivity as a parameter underlying long run growth. The connection between these frameworks is proposed and elaborated. The paper sheds some light on the nature of total factor productivity and designates the directions for further research on fundamental conditions of high-quality development.

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I. Introduction

Over the last 30 years or so, our understanding of prerequisites for economic and social development has deepened significantly. One of the improvements is concerned with the way we think about the role of political and economic decisions: they do not happen in vacuum and their effectiveness depends not only on their compliance with prescriptions of Washington Consensus or certain expert knowledge but also with the quality of political and economic institutions which are involved in the implementation of decisions. This idea, although simple, is sometimes regarded as a basis for a theoretical shift which put "good governance" and institutional framework of societies in the center of attention of social scientists[3].

However, it is not at all obvious that taking institutions into account is the final theoretical step. At the outset of 1990s another research agenda gained momentum, though it has never been so influential as (neo)institutional theory. Different but deeply related perspectives on the most fundamental conditions of social performance developed across social sciences: the theory of social capital has been the object of much attention in sociology[4] and political science[5]; cultural beliefs have been considered as a basic structure which determines the way institutions function[6]; later, economics and new political economy have become interested in the way culture affects ultimate social arrangements[7]. This interest in culture suggests that it may play for the functioning of institutions the same role as institutions play for the performance of decisions: it provides the context which is necessary to understand why some institutions succeed and others fail.

Therefore, we need theoretical frameworks which allow for thinking about institutions and conditions of their performance in a coherent and clear way.

The principal aim of the paper is to sketch one possible strategy for developing such a framework (it is worth stressing that the subsequent analysis is purely exploratory in its nature and does not lead to any definite conclusions; it rather designates directions for the future research). Two theories serve as the point of departure: 1) the theory of Institutional Possibility Frontier (IPF) as elaborated by Djankov et al.[8]; 2) and the idea about the role of total factor productivity (TFP) as a variable which affects the sustainability of economies to bad decisions, crises and differences in the interests of social groups[9].

The second section of the paper provides brief descriptions of these theories. In the third section, I show that they can be regarded tightly interconnected and that the idea about the

[3] Rothstein B. (2012). Good Governance. In David Levi-Faur (Ed.) *The Oxford Handbook of Governance* (p. 143-154). Oxford, Oxford University Press.
[4] See, for example, a seminal work by Joseph Coleman: Coleman J. (1988). Social Capital in the Creation of Human Capital. *American Journal of Sociology, 94*, p. 95-120.
[5] Putnam R. (1993). *Making Democracy Work: Civic Traditions in Modern Italy*. Princeton: Princeton University Press.
[6] Greif A. (1994). Cultural Beliefs and the Organization of Society: A Historical and Theoretical Reflection on Collectivist and Individualist Societies. *Journal of Political Economy, 102*(5), p. 912-950.
[7] Tabellini G. (2008). Presidential Address: Institutions and Culture. *Journal of the European Economic Association, 6*(2/3), p. 255-294.
[8] Djankov S., Glaeser E., La Porta R. et al. (2003). The New Comparative Economics. *Journal of Comparative Economics, 31*, p. 595-619.
[9] Akhremenko A., Petrov A. (2014). Efficiency, Policy Selection, and Growth in Democracy and Autocracy: A Formal Dynamical Model. *NRU HSE Working Paper*; Ахременко А.С., Локшин И.М., Юрескул Е.А. (2015). Экономический рост и выбор политического курса в авторитарных режимах: "недостающее звено". *Полития, 78*(3), с. 50-74.

"stabilizing" role of TFP may be used for partial formalization of the theoretical insights about the IPF. The fourth section considers the possible interpretations of TFP in the light of the preceding analysis and some questions are posed about the nature of fundamental prerequisites for efficient institutions.

II. The review of two theories

II.1. The dictatorship - disorder tradeoff and the Institutional Possibility Frontier

Djankov et al.[10] base their framework for thinking about institutional efficiency on a rather well-known tradeoff between dictatorship and disorder[11]. All societies confront this fundamental tradeoff but it has different consequences for them: some societies suffer from it much more than others. Djankov et al. focus upon the performance of institutions in the context of the said tradeoff and they presume that the reason why institutional performance in certain countries is much better than in others is accounted for by at least two factors: 1) the extent to which institutions manage to control and decrease social losses from the associated degree of disorder and dictatorship; 2) the location and the shape if the IPF[12].

Thus, independent judges may imply approximately the same scope of social losses due to the relative proximity to the pole of disorder as regulatory state due to the proximity to the pole of dictatorship. As far as the second factor is concerned, Djankov et al. by way of illustration refer to Sweden and China as countries with comparatively better conditions for institutional performance than Albania or Congo[13]. Hence, in former countries social losses due to dictatorship and disorder turn out to be less than in the latter, *ceteris paribus*.

This conceptual framework is illustrated by a scheme which depicts the IPF as a curve reflecting the scope of social losses emanating from excessive disorder or dictatorship (see Figure 1).

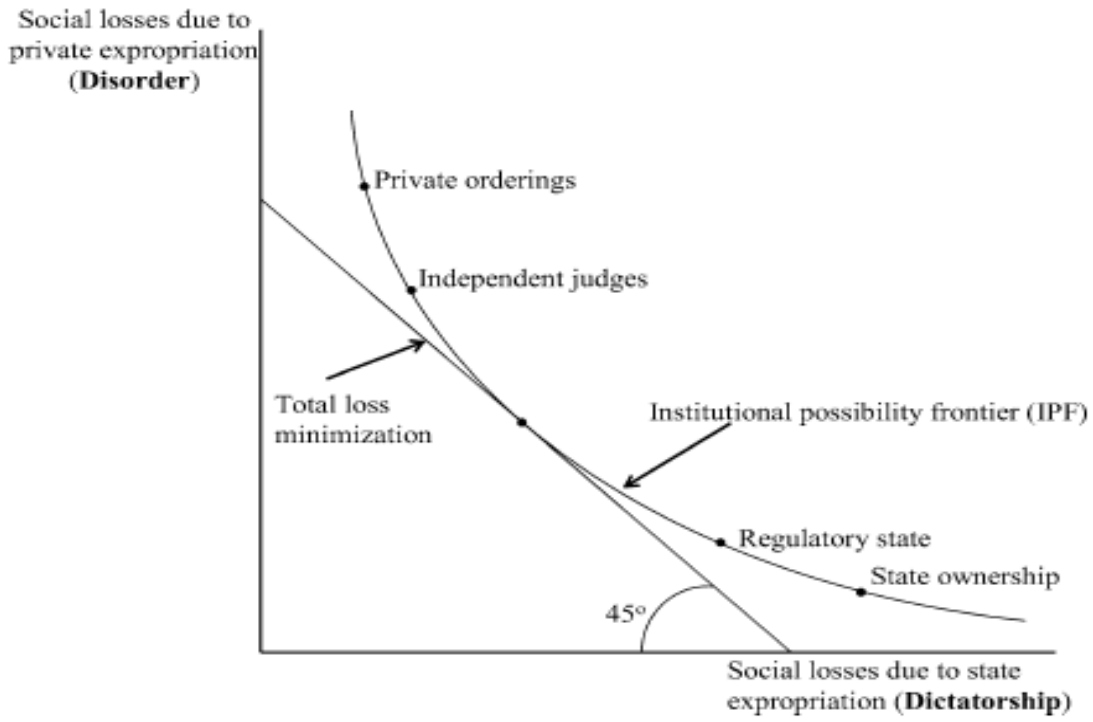
In the context of the present paper I am mostly interested in the location of the IPF and in the extent to which it fits the total loss maximization line. Both parameters determine the acuteness of the tradeoff between disorder and dictatorship and have an obvious relation to the fundamental factors upon which institutional performance depends in general. In other words, these parameters propose the way to the formalization of the cultural influence on the functioning of institutions.

What, then, is the nature of these parameters? Djankov et al. refer to the location of the IPF as civic capital. They argue that "societies with more such capital, and an IPF closer to the origin, are more capable of achieving cooperation among other members"[14]. Hence, the location of the IPF is concerned, as Djankov et al. argue, with the extent to which individuals in a given

[10] Djankov S., Glaeser E., La Porta R. et al. Op. cit.
[11] To some extent, the same tradeoff can be found in contemporary studies in political science about two types of democracy: adversarial democracy implies less checks on power but more responsible government, while consensual democracy puts emphasis on the representativeness rather than responsibility of government with a potential of political deadlock as a reverse side. See, e.g.: Norris P. (2004). *Electoral Engineering: Voting Rules and Political Behavior*. Cambridge: Cambridge University Press, p. 69; Lijphart A. (1999). *Patterns of Democracy: Government Forms and Performance in Thirty-Six Countries.* New Haven: Yale University Press, p. 9-47.
[12] Djankov S., Glaeser E., La Porta R. et al. Op. cit., p. 600.
[13] Ibid.
[14] ibid., p. 600.

society are prone to cooperate with each other, and the cooperation is regarded as a major factor affecting the severity of the tradeoff between dictatorship and disorder.

Figure 1. Institutional possibilities[15]



It is this assertion which paves the way for thinking about the said tradeoff in terms of total factor productivity.

II.2. Total factor productivity and some of its effects

Technically, total factor productivity is the parameter *A* in the Cobb-Douglas production function. It is a residual "measure of our ignorance"[16] which appears due to production factors not taken into account in Cobb-Douglas function. The debates about the nature of TFP have been lasting for several decades and pose an important question about the sources of economic growth.

One strategy to clarify the nature of TFP is to try to understand its effects better. In this section, I restrict discussion to the possible political effects of TFP which are largely overlooked in the existing literature.

The framework for this discussion is based upon the version of Cobb-Douglas function, namely

$$Y(t) = A_t K^{\alpha}(t) G^{1-\alpha}(t), \qquad (1)$$

where Y is the total output, A is total factor productivity, K is the input of private capital, G is the input of public capital, α stands for the output elasticity and t denotes the period. Note that

[15] Source: Djankov S., Glaeser E., La Porta R. et al. Op. cit., p. 599.
[16] Hulten C. (2001). *Total Factor Productivity: A Short Biography*. Retrieved June 29 2015 from NBER Working Papers, http://www.nber.org/chapters/c10122.pdf.

the subscription for A implies that TFP can change through time but, in contrast to private and public capital, we do not have the explicit formula for variation of A across different periods.

There is a tax rate τ which determines the size of state budget $I(t)$:

$$I(t) = \tau Y(t). \quad (2)$$

The input of private capital in the next period is expressed as

$$K(t+1) = (1-\tau)Y(t) \quad (3)$$

and the input of public capital in the next period is

$$G(t) = (1-\delta)G(t) + \gamma I(t), \quad (4)$$

where δ denotes the depreciation rate and γ is the investment parameter which determines the share of the budget which is "effectively" used. Correspondingly, $1-\gamma$ denotes the share of the budget which is "wasted" from the point of view of public capital. Some substantial interpretations of $1-\gamma$ will be proposed later.

Parameters τ, δ and γ vary between 0 and 1.

Assume that government can determine the values of τ and γ under fixed A, so that (τ, γ) constitutes the space of policies. What are the combinations of these parameters which lead to the sustainable economic growth in the long run? The answer depends partially (albeit significantly) on A. The form of this dependence was analyzed via computational experiment[17]; Figure 2 presents the results.

In other words, the increase in TFP broadens the space of successful policies.

Another effect of TFP can be revealed if the model above is interpreted in terms of conflicting interests of social groups. Recall that $\gamma I(t)$ is the share of the budget invested in public capital. What is, then, the residual share of the budget $(1-\gamma)I(t)$? One way of interpretation is to associate it with rent which is gained by actors involved in budget (re)allocation. To put it in other way, $(1-\gamma)I(t)$ can be regarded as the share of the budget that is "privatized" by public officials (government and/or bureaucracy); they comprise an interest group that is called "rentier" for brevity of presentation[18]. The utility function of a representative individual from rentier group is

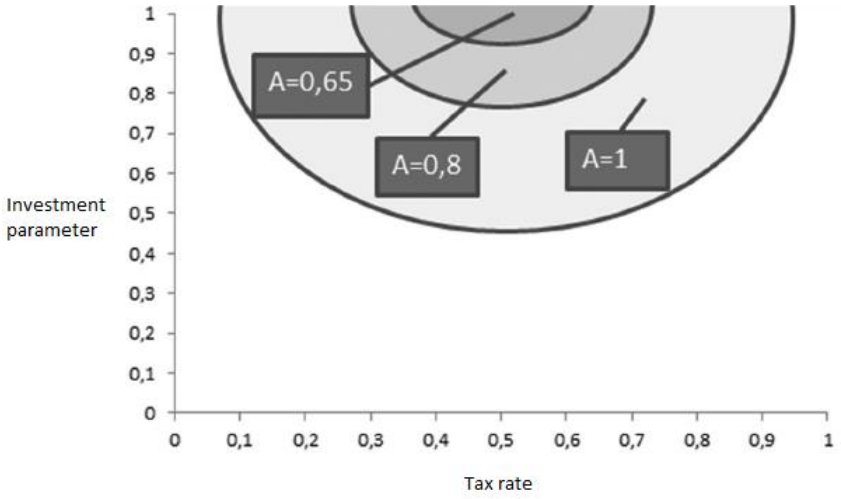
$$U_R = \sum_{t=1}^{\infty} \sigma^{t-1}[(1-\gamma)I(t)],$$

[17] Ахременко А.С., Локшин И.М., Юрескул Е.А. Op. cit.

[18] The assumption that no share of the rent returns to the budget is an obvious simplification of the model; however, it does not affect the interpretation of TFP and therefore can be tolerated in this paper.

where σ is the discount factor for rentier[19].

Figure 2. The space of policies leading to the long run growth[20]



Consider another group which is interested in the increase of private capital input K. In what follows, they are called "capitalists". The utility function of a representative capitalist is given by

$$U_C = \sum_{t=1}^{\infty} \psi^{t-1} K(t),$$

where ψ denotes the discount factor for capitalists[21].

As long as capitalists and rentier have different utility functions, their optimal combinations of τ and γ may differ from each other. An obvious question for political scientists is: to what extent are they different depending on various parameters of the model? Once again, the analysis shows[22] that the distance between the optimal points of capitalists and rentier in the policy space (τ, γ) heavily depends on A. This fact is illustrated on Figures 3, 4 and 5 that are gained under the assumption that $\sigma = \psi$.

On Figures 3-5, the criss-cross denotes the optimal combination of τ and γ for the maximum growth of the economy, the triangle stands for the optimal point for capitalists and the square represents the optimal point for rentier. The grey zone comprises all points which allow for long run growth under given conditions.

[19] Ахременко А.С., Локшин И.М., Юрескул Е.А. Op. cit., с. 59.
[20] Source: Ахременко А.С., Локшин И.М., Юрескул Е.А. Op. cit., с. 58.
[21] Ibid.
[22] Ахременко А.С., Локшин И.М., Юрескул Е.А. Op. cit.

Figure 3. Optimal combinations of τ and γ for capitalists, rentier and maximum growth, $A = 0.5$[23]

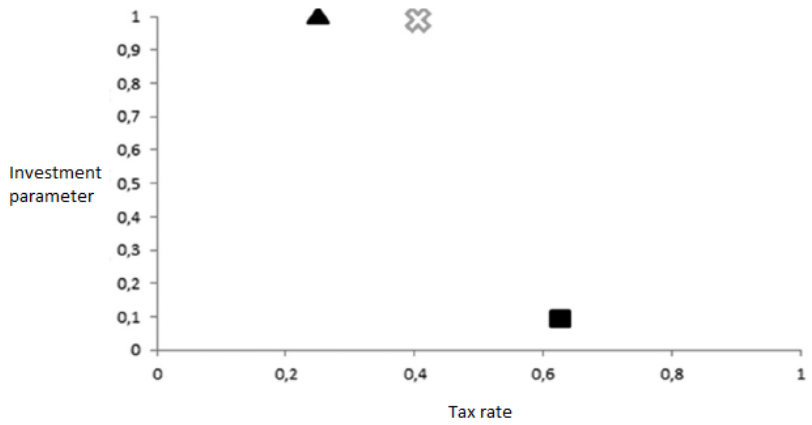
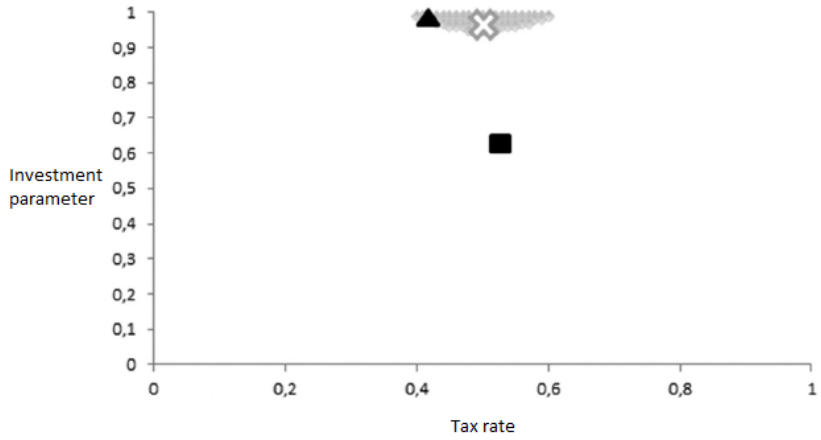


Figure 4. Optimal combinations of τ and γ for capitalists, rentier and maximum growth, $A = 0.65$[24]



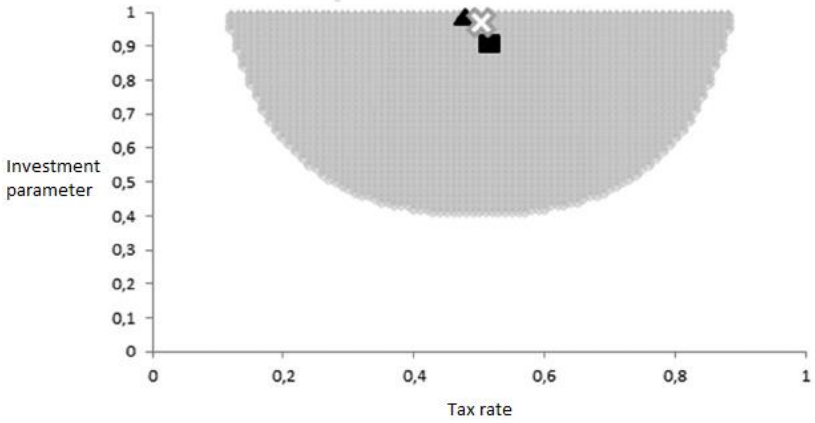
As Figures show, the increase in A is linked with three effects: 1) the convergence of the optimal points for capitalists and rentier; 2) the broadening of the space of successful policies; 3) decreasing distance between the optimal points for the group interests and the maximum growth.

These effects of TFP can be amplified or weakened depending on the value of discount factor: the closer it is to 1, the more are pronounced the effects mentioned above.

Thus, TFP seems to make economy more robust to suboptimal decisions and facilitates the choice of policies which are acceptable for both interest groups.

[23] Source: Ibid., c. 62.
[24] Source: Ibid., c. 64.

Figure 5. Optimal combinations of τ and γ for capitalists, rentier and maximum growth, $A = 1$[25]



III. The linkages between institutional possibilities frontier and total factor productivity

The models described above have quite deep connections and similarities.

In the framework proposed by Djankov et al. the space above the IPF constitutes the space of institutional choices that can be achieved; the IPF which is close to the origin allows for more relatively successful institutional choices. In the second model there is a analogue of the space of successful institutional choices, namely, the space of successful policies. That space is determined, among other factors, by TFP. The comparison of the models suggests that, if it could be shown that two said spaced are closely connected to each other, TFP may be regarded as a factor influencing the closeness of the IPF to the origin.

One way of revealing such a connection is to associate the tradeoff between dictatorship and disorder with interest groups which have been designated in the discussion of the second model. Indeed, it is reasonable to assume that public officials who control the redistribution of the budget "represent" the pole of dictatorship: if they are not restrained in pursuing their interests, the scope of regulation and "state abuse" would be so high that the term "dictatorship" would seem suitable. On the other hand, capitalists can be considered as an interest group which aspires to the restriction of state regulation (though not necessarily to its complete abandonment) and, thus, to more "disorder". More than that, some subgroups of capitalists may be willing to maintain (quasi)anarchical disorder due to their comparative advantages following from weak enforcement of property rights[26].

Such interpretation urges the discussion of social losses which are associated with the closeness to the poles of disorder and dictatorship. Actually, social losses can be formalized with the help of the second model.

As far as rentier represent the pole of dictatorship, there must be something in their interests that can be regarded as social losses due to dictatorship. An obvious candidate is the investment parameter γ : the smaller it is, the less share of the budget is used in a way conducive

[25] Source: Ibid., c. 65.
[26] Sonin K. (2003). Why the Rich May Favor Poor Protection of Property Rights. *Journal of Comparative Economics, 31*, p. 715-731.

to overall growth. On the other hand, social losses due to disorder should be linked to the interests of capitalists. To do that, we have to loosen up the original and rather unrealistic assumption that capitalists maximize private capital and cannot "cheat" in any way; in fact, they may do that by not paying taxes and trying to capture the state. In order to formalize the idea, we introduce the parameter θ which may be interpreted as the amount of unpaid taxes if $\tau \geq \theta$ and as the degree (more precisely, such a degree is expressed as $\theta - \tau$) to which capitalists manage to accomplish the state capture if $\tau < \theta$ (i.e., in this case capitalists not only do not pay taxes but also privatize the part of the total output which should have been used for the investments in public capital).

Another change in the initial model is concerned with the refinement of the utility functions.

While capitalists want to preserve more private capital under assumption that they can hide the part of taxes, they also have to take into account the effect that the underpay may have on the growth and, hence, on private capital in the current and/or subsequent period(s). The similar logic applies to rentier: they have to pay attention to the effects of their actions on the current and/or next period(s).

Prior to formalizing these assertions, it is reasonable to make some simplifying assumptions which hold both for capitalists and rentier. First, assume that representative individuals from the interest groups of capitalists and rentier have an opportunity to determine the values of parameters θ and γ in each period separately. Second, assume that those parameters depend on each other (they both affect total output) and, hence, it is possible to think about the decisions of capitalists and rentier in terms of strategic behavior and game theory. Third, assume that a game is sequential and its timing is established as follows: θ_0 and γ_0 are set exogenously (by "nature"), then rentier fix γ_1 depending on θ_0, then capitalists set θ_1 depending on γ_1 and so forth; generally, θ_{t-1} influences γ_t which, in turn, influences θ_t. Third, assume that representative individuals from interest groups determine θ_t and γ_t *during* the period t, so that they do not know the exact amount of total output in that period and make decisions on the basis of the *expected* total output. Fourth, let representative individuals estimate the influence of their decisions in period t for the total output in the same period only and not further. Fifth, and this assumption seems to be most restrictive, assume that the expected total output in the period t is not considered by rentier and capitalists as a function of either θ_t or γ_t; however, the severity of this assumption is mitigated in two ways: 1) in the utility functions that follow, we presume the "quasidependence" of the expected total output on θ_t and γ_t because they "interact" with each other via multiplication, so that the change in those parameters influences the benefits (losses) from the change in the expected total output; 2) total output indeed depends on some factors such as TFP and tax rate much more heavily than on θ_t and γ_t.

Let the utility function of capitalists in the period t be

$$U_t^c = (1 - \tau + \theta_t) Y_{t-1} - \frac{\psi E_{Y_t} \theta_t^2}{\gamma_t^I}, \qquad (5)$$

where $(1-\tau+\theta_t)Y_{t-1}$ stands for the amount of private capital in the period t, ψ is the discount factor, E_{Y_t} is the expected total output in the period t, l is the elasticity parameter that determines the extent to which the capitalist's utility is affected by γ, $l \in [0,1]$ and $\frac{\psi E_{Y_t} \theta_t^2}{\gamma_t^l}$ comprise the discounted losses[27] due to the underpay of taxes in the current period.

The optimal value of θ_t which maximizes[28] U_t^c is then

$$\theta_t^* = \frac{\gamma_t^l Y_{t-1}}{2\psi E_{Y_t}} \tag{6}$$

Thus, θ_t^* may be regarded as a proxy for the social losses due to disorder in the period t.

A proxy for the social losses due to dictatorship in the same period can be obtained in a similar way.

The utility function of rentier may be approximated[29] by

$$U_t^r = (1-\gamma_t)(\tau-\theta_{t-1})Y_{t-1} - \frac{\sigma(1-\gamma_t)^2 E_{Y_t}}{(1-\theta_{t-1})^m}, \tag{7}$$

where $m \in [0,1]$ is elasticity parameter and $\frac{\sigma(1-\gamma_t)^2 E_{Y_t}}{(1-\theta_{t-1})^m}$ represents the discounted losses for rentier in the next period due to opportunistic behavior.

The optimal[30] value for $1-\gamma_t$ is then equal to

$$1-\gamma_1^* = \frac{Y_{t-1}(\tau-\theta_{t-1})(1-\theta_{t-1})^m}{2\sigma E_{Y_t}}. \tag{8}$$

As formulas (6) and (8) suggest, the social losses due to disorder and dictatorship depend on the ratio $\frac{Y_{t-1}}{E_{Y_t}}$; but notice that, in expanded form, this ratio equals $\frac{A_{t-1}\sqrt{K_{t-1}G_{t-1}}}{E_{A_t\sqrt{K_tG_t}}}$ (provided that $\alpha = 0,5$), so that the expected changes in TFP matter: the expected increase in TFP diminishes social losses on the both poles of the disorder-dictatorship continuum.

[27] The actual formula for social losses based on formulas (1-4) can be obtained quite easily, however, it is much more cumbersome. The simplified version proposed in the main text is in compliance with the general consequences that would follow from the use of the "real" formula for social losses but it is significantly more comfortable for the analysis.
[28] Obviously, the second derivative is negative, hence, we have the conditions for maximum.
[29] As in the previous case, the precise formula can be deduced with no difficulty but it has too bad properties to be used in the following analysis.
[30] The second derivative is evidently negative, so that the conditions for the maximum hold.

Thus, there is a twofold linkage between TFP and the institutional possibilities frontier. Firstly, TFP can be regarded as one of the factors that determines the closeness of the IPF to the origin. Secondly, TFP influences the scope of social losses, hence, the fit of the IPF to the total loss minimization line (see Figure 1) depends on TFP.

The evident question is concerned with the very foundation for comparisons between two theoretical frameworks: is it reasonable to discuss the social losses from institutional choices in terms of a specific economic parameter such as total factor productivity? It may seem, the answer should be negative because quite often TFP is interpreted as a "technical" parameter which does not have much to do with the broad social infrastructure and the workings of social institutions. However, this assertion can be challenged both on theoretical and empirical grounds. The analysis presented above should be built into the literature on the nature of TFP and fundamental prerequisites of long run economic growth and development. In the next section, I will attempt to draw some conclusions which can be revealed on the boundaries between different interpretations of the nature of TFP.

IV. Discussion

The parallels drawn above between two theoretical frameworks may be useful in two respects.

First, they may be conducive for building a bridge between hitherto distinct research fields, one concerned with the attempts to "decipher" total factor productivity and the other regarding the fundamental differences in the quality of institutions between societies. Moreover, the sketch of formalization presented above may be helpful to translate "qualitative" argumentation about social losses and the disorder-dictatorship space into more rigorous language, though with necessarily simplifying assumptions. Finally, the effect of TFP concerned with the broadening of the space of successful policies has parallels not only in the Djankov and et al.'s framework but also in North et al.'s assertion about the long run growth: the authors of "Violence and Social Orders" argue that the dynamic of economic growth in developed countries is characterized not by relatively fast growth but with relatively stable one[31]. This is precisely the effect of sustainability which is associated with high TFP. So, through the notion of TFP the agenda of New Comparative Economics presented in Djankov et al. may be linked to the agenda of institutional economics developed in "Violence and Social Orders".

Second, the considerations from the previous section of the paper shed some light on the nature of TFP. It is worth mentioning that, due to the "residual" character of TFP, it is not at all clear how it can be interpreted in substantial terms. The obscurity of the essence of TFP is in conflict with its importance for growth: there are serious reasons to take TFP for one of the major determinants of economic development and a factor which influences main differences

[31] North D., Wallis J., Weingast B. (2009). *Violence and Social Orders: A Conceptual Framework for Interpreting Recorded Human History.* Cambridge: Cambridge University Press, p. 6.

between economic performance across countries[32]. Not surprisingly, economists acknowledge the need for the consistent theory of TFP[33].

What are the implications for TFP that can be drawn from the preceding analysis? First, recall that the social losses due to both disorder and dictatorship turned out to be dependent on the ratio of A_{t-1} and the expected A_t. Taking into account the utility functions of capitalists and rentier given as in formulas (5) and (7), one can conclude that A_{t-1} is associated with the gains from "opportunistic behavior", i.e., increasing θ_t and $1-\gamma_t$ respectively, while the expected A_t partially determines the losses from "opportunistic behavior" due to the reduction in the size of total output as public good *sui generis*. Hence, the ratio $\frac{A_{t-1}}{E_{A_t}}$ affects the relative attractiveness of "opportunistic behavior". The expected increase in TFP makes it more reasonable for individuals to contribute to the "public good" of total output rather than to their own enterprise which is in conflict with the overall growth.

Consequently, in the framework presented above the increase in TFP mitigates the severity of prisoners' dilemma: it stimulates actions which are beneficial for the society as a whole. However, such an effect is traditionally associated with the notion of social capital[34]. The analogy between the effects of social capital and TFP paves the way for linking these concepts with each other. Although such a conclusion is clearly built upon weak analogy, it is strengthened by another similarity between the theories covered in sections II.1 and II.2.

Recall that there is a connection between the space of successful institutional choices in the framework proposed by Djankov et al. on the one hand and the space of successful policies in the theory centered around TFP on the other hand. The size of the space of successful institutional choices is said to be dependent upon civic capital[35]; the size of the space of successful policies in the second model is dependent upon TFP, as is shown in Figure 2. Thus, it is possible to presume a close link between TFP and civic capital, with the latter a refined version of the notion of social capital[36]. Once again, the interpretation of TFP suggests the importance of positive social bonds and social embeddedness which, in turn, may comprise an important part of "social infrastructure" which is conducive to long run growth[37]. Some evidence substantiates the hypothesis that the aspects of social capital and social embeddedness, such as trust, are an important source of economic growth[38].

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[32] Easterly W., Levine R. (2001). It's Not Factor Accumulation Stylized Facts and Growth Models. *The World Bank Economic Review, 15*(2), p. 177-219.

[33] Prescott E. (1997). *Needed: A Theory of Total Factor Productivity*. Retrieved June 29 2015 from Federal Reserve Back of Minneapolis, https://www.minneapolisfed.org/research/sr/sr242.pdf.

[34] Putnam R. Op. cit.; Fukuyama F. (1995). *Trust*. New York: The Free Press. Luigi Guiso and coauthors refine the notion of social capital by introducing the concept of civil capital which has basically the effect mentioned in the main text above; as they state, civic capital may be defined as *"those persistent and shared beliefs and values that help a group overcome the free rider problem in the pursuit of socially valuable activities"* (Guiso L., Sapienza P., Zingales L. (2010). *Civic Capital as the Missing Link*. Retrieved September 18 2015 from NBER Working Papers, http://www.nber.org/papers/w15845.pdf.

[35] Djankov S., Glaeser E., La Porta R. et al. Op. cit.

[36] Guiso L., Sapienza P., Zingales L. Op. cit.

[37] Hall R., Jones C. (1999). Why Do Some Countries Produce So Much More Output Per Worker Than Others? *The Quarterly Journal of Economics, 114*(1), p. 84.

[38] Bjørnskow C., Méon P.-G. (2013). Is Trust the Missing Root of Institutions, Education, and Development? *Public Choice, 157*: 641-669; Knack S., Keefer P. (1997). Does Social Capital Have an Economic Payoff? A Cross-Country Investigation. *The*

However, this is not the only interpretation of TFP which is concerned with aspects of social infrastructure and deep cultural characteristics. Other perspectives consider "the effectiveness of resistance to the use of better technologies"[39] as the essential feature of TFP and thereby stress "the innovative spirit" as the driving force behind the growth of TFP. At the same time, "the innovative spirit" operates at the heart of capitalist system: as Schumpeter pointed out in the passage about "creative destruction", "the fundamental impulse that sets and keeps the capitalist engine in motion comes from the new consumers' goods, the new methods of production or transportation, the new markets, the new forms of industrial organization that capitalist enterprise creates"[40]. One can single out at least two conditions which form "the innovative spirit": economic and political institutions (such as the protection of property rights and the set of laws that create conditions for economic competition) which preserve and foster stimuli for innovative behavior; and cultural environment, which create and encourages such stimuli.

The latter assertion is problematic because fundamental stimuli for economically innovative behavior can be attributed to nature rather than to culture, in a way similar to Adam Smith's conclusions about the universal and natural "propensity to truck, barter, and exchange one thing for another"[41]. However, there are strong grounds to believe that it is cultural environment, not nature, which plays the main role in creating basic stimuli for economic innovation. For instance, personal gain and economic interest, though may be regarded as embedded in human nature, had to obtain cultural approval or even be invented as distinct psychological forces to become the major driving force behind the aspiration to innovate[42]. The equally important observation is that such stimuli are centered around individualistic aspirations; the point is illustrated by the very concept of *homo economicus* which underlies neoclassical economic theory (though it may be too simplified to reflect real human behavior, the basic intuition stresses the importance of self-interest as a "passion" which drives economic competition and innovation). Recent research bolsters the significance of cultural individualistic environment for growth as well: it is argued that "countries with a more individualist culture have more innovation, higher productivity and higher long-run growth than countries with a more collectivist culture"[43]. To sum up, "the innovative spirit" which seems to be the fundamental feature of TFP may be associated with individualistic culture and aspirations to innovate which take their origin in economic self-interest.

Thus, there are two perspectives which associate TFP with cultural characteristics: the first one associates TFP with social capital and social embeddedness while the second one posits individualistic stimuli at the heart of cultural dimension of TFP. The problem is that these two

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Quarterly Journal of Economics, 112(4), p. 1251-1288; Tabellini G. Op. cit.; Tabellini G. (2010). Culture and Institutions: Economic Development in the Regions of Europe. *Journal of the European Economic Association, 8*(4), p. 677-716.

[39] Prescott E. Op. cit.

[40] Schumpeter J. (2003). *Capitalism, Socialism and Democracy*. New York: Routledge, p. 82-83.

[41] Smith A. (2008). An Inquiry into the Nature and Causes of the Wealth of Nations. Oxford: Oxford University Press, p. 21.

[42] As Robert Heilbroner put it, "it may strike as odd that the idea of gain is a relatively modern one; we are schooled to believe that man is essentially an acquisitive creature and that left to himself he will behave as any self-respecting businessman would. The profit motive, we are constantly being told, is as old as man himself. But it is not. The profit motive as we know it is only as old as "modern man" (Heilbroner R. (1999). *The Worldly Philosophers: The Lives, Times, and Ideas of the Great Economic Thinkers*. New York: Simon and Schuster, p. 24). The "invention" of the notion of economic interest is traced in Hirschman A. (1997). *The Passions and the Interests: Political Arguments for Capitalism before Its Triumph*. Princeton: Princeton University Press.

[43] Gorodnichenko Y., Roland G. (2011). Individualism, Innovation, and Long-Run Growth. *Proceedings of the National Academy of Sciences of the United States of America, 108*(4), p. 21316-21319.

perspectives seem to contradict each other: individualistic culture is usually interpreted as an opposite to social embeddedness[44] and the latter (even under the name of social capital) may imply serious limitations for pursuing individualistic goals due to the practice of sharing benefits with the members of the same social group[45]. It may be argued, however, that the network structure of society, cooperation and better spread of information are associated with social capital and therefore it is clearly conducive to innovation[46]. This perspective, however, simplifies the problem: first, high social capital *inside* established groups may have a reverse side and may imply weak ties *between* groups[47] thereby restricting cooperation and the spread of information in the scope of society as a whole; second, it is not at all clear why potential innovators may be ready to share their insights and resources with other individuals and groups; very bright anecdotal evidence may be drawn from the early history of modern mathematics: many scholars were very reluctant to uncover their discoveries for colleagues; this reluctance underlies the dramatic history of obtaining the formula for the solution of cubic equations[48], the decline in relationship between Bernoulli brothers[49] and the inclination of Pierre de Fermat to hide his methods of solutions and proofs is notorious. In other words, social capital may indeed foster innovations but it is far from clear under what conditions social capital emerges in the context of interactions between innovators.

Nevertheless, it is possible that both perspectives on TFP are partially true. Perhaps, it is this difficult, somewhat paradoxical combination that conditions the economic success of Western countries on the fundamental level of cultural values and dispositions. To inscribe the problem in a broader context, consider a crude typology of societies (Table 1).

Table 1. Cultural characteristics and types of societies

		Social capital and social embeddedness	
		High	*Low*
Socially approved individualistic values	*High*	Contemporary Western societies	Societies under "wild capitalism"
	Low	Traditional societies	Anomic societies

Socially approved individualism without a balancing effect of tight social bonds may be destructive and imply high social costs as it were during economic transitions in a number of post-communist countries or during the era of weakly restrained capitalistic contest in the nineteenth-century West[50]. Traditional societies which comprise the major share of the Third World are famously less economically successful either because of bad institutions[51] or

[44] Stephan U., Uhlaner L. (2010). Performance-Based vs Socially Supportive Culture: A Cross-National Study of Descriptive Norms and Entrepreneurship. *Journal of International Business Studies, 41*(8), p. 1347-1364.
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[47] For negative effects of social capital, see Portes A. Op. cit.
[48] See the story of Girolamo Cardano: Гиндикин С.Г. (2006). *Рассказы о физиках и математиках*. М.: МЦНМО, с. 13-44.
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unfavorable natural conditions[52] or due to some other reasons. The latter may be concerned with some fundamental features of social infrastructure including peculiarities of cultural environment. The strange dual nature of TFP seems to be associated both with individualistic " innovative spirit" and collectivistic mechanisms of solving social dilemmas; this paradoxical combination highlights a number of problems which appear quite marginal for the research on the long run growth. What is the type of social ties which are compatible with individualistic stimuli lying behind competition and innovation on the micro-level? Under what conditions individualistic culture bringing about innovative behavior is fostered by (quasi)collectivistic social practices? The questions of this sort which go beyond conventional discourse centered around stimuli-preserving institutions (such as secure property rights) may turn out to be quite important for better understanding of idiosyncratic Western experience lying at the heart of its impressive economic growth during the last 150 years. These investigations may be intimately connected with clarifying the nature of total factor productivity.

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