The World Bank Economic Review Advance Access published April 8, 2015

Culture in Development

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An anti-capitalist cultural bias, through directed within-family human capital transmission, adversely affects the supply of entrepreneurial talent and risk-taking. This limits economic progress if aggregate productivity is low. When productivity is high, economic incentives can overcome cultural inertia. Though the income level depends on culture, the growth rate in this case does not. JEL Codes: O11, O43, Z13

Introduction

The best-known case for the salience of culture in economic lives is probably Max Weber's classic work, *The Protestant Ethic and the Spirit of Capitalism* (1904–05, 1930). In it Weber underscores the tensions inherent in the Calvinist doctrines of predestination and vocation, tensions that were resolved by prioritizing material well-being and wealth accumulation through thrift, hard work, and restrained living. These capitalist values, Weber argues, explain England's early start relative to Catholic Italy and Spain, as well as Lutheran Germany.

In subsequent research, anecdotal evidence has often been used to advance the premise that culture matters for growth. The success of minority populations, such as the Chinese in Southeast Asia, the Lebanese in West Africa, and Indians in East Africa, is held up as an instance of culture trumping adversity. More systematic evidence, mindful of potential endogeneity issues, has been offered in recent years. For instance, Tabellini (2010) identifies trust as a cultural value behind Europe's regional development. Gorodnichenko and Roland (2013) point to individualism, as opposed to collectivism, as an explanation for cross-national differences in output per worker and innovation. To these kinds of evidence one could add Michalopoulos and Papaiannou's (2014) general finding that one cultural institution, tribal affiliation, has been more influential for Africa's local development than national political and economic institutions.

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THE WORLD BANK ECONOMIC REVIEW, pp. 1–9 doi:10.1093/wber/lhv018

Yet, just as culture has been favored by many researchers, it has also been met with skepticism (e.g., Srinivasan 1984). As late as 1915, when Japan was well in the throes of radical change, an Australian expert had this to say about the Japanese: ". . . you are a very satisfied easy-going race who reckon time is no object. When I spoke to some managers they informed me that it was impossible to change the habits of national heritage" (ibid., 53). More than likely, softer cultural attitudes like work ethic do change when circumstances change. Consider also Weber's subsequent works on China (1951) and India (1958), where Confucian values and the caste system are deemed hostile to capitalist values, future prosperity.[1] Those values are unlikely to have shifted fundamentally in the intervening decades. What then are we to make of China and India's impressive growth now?

There is room here for theory to inform us about the relevance of culture in long-term growth and development. The first challenge is identifying a hard cultural trait, one slow to adapt, that fundamentally affects economic development. We focus on the simplest—an attitude towards entrepreneurship—that can be broadly thought of as an aversion towards striking out on one's own rather than the safety of established choices such as wage-work, public sector employment, and low-risk less-innovative businesses. Secondly, the theory should be dynamic since it is important to understand how the cultural trait alters intertemporal tradeoffs, which then feed back into cultural change. Thirdly, any theory of culture and development should be able to account for growth take-offs from "opening up" as we have seen in Japan, China, India, and some Eastern Bloc countries since the fall of the Berlin Wall. The conclusion we reach from such an analysis is that an anti-entrepreneurial culture can constrain economic progress for a while but is readily subjugated by economic changes that improve aggregate productivity.

A Model of Capitalist Culture

The development of an entrepreneurial, or capitalist, base is widely presumed to favor national prosperity. As Lewis (1955) notes: "economic growth is bound to slow unless there is an adequate supply of entrepreneurs looking out for new ideas and willing to take the risk of introducing them" (82).

The economy in any period t is populated by active agents of mass one who were born in $t-1$ and die at the end of t. The population differs in two types of human capital. One is specific to entrepreneurship, business expertise x_t, with lower values corresponding to higher expertise. The other, conventional labor productivity pertaining to wage-work, is denoted by h_t. The former can be improved through business experience, the latter through skill investment prior to working. These human capitals are intergenerationally transmitted, from parent to (biological or cultural) offspring. At $t = 1$, the initial population starts out

1. Surprisingly, the empirical case for Weber's original hypothesis is also weak; see Cantoni (2014).

with basic and homogeneous labor productivity $\underline{h} > 0$ but different types of business expertise: a fraction m_1 is endowed with $\underline{x} > 0$, the remaining fraction with $\bar{x} > \underline{x}$. This m_1 fraction becomes the initial entrepreneurs, and we denote the entrepreneurial share by m_t for $t \geq 1$.

Occupations

As children, agents acquire human capital from their parents or through social influence. As working adults they choose an occupation, acquire further human capital, and have children, one per parent, whom they try to socialize into their own occupation-specific human capital. Since agents die by the end of t, there is no consumption smoothing. They are risk averse, their utility from consumption (income) being logarithmic. Wage-work is risk-free, with agents accurately projecting the rational expectations equilibrium wage determined in competitive markets. A worker with human capital h_t earns labor income $w_t h_t$, w being the wage rate per effective unit of labor. Entrepreneurial activity, on the other hand, is inherently risky. The profit from a typical business is $\pi_t = e^{-(q_t - \phi_t)^2}[2a_t l_t^{1/2} - w_t l_t]$, where a_t is technology-specific productivity and q_t the "ideal way" to operate the firm (Jovanovic and Nyarko1996; Hassler and Mora 2000). Note that a_t maps into total factor productivity at the aggregate level.

The entrepreneur chooses her business action ϕ_t and efficiency units of labor l_t to hire. Profits are uncertain because the entrepreneur does not know the best level at which to operate the business. She knows that q_t fluctuates around a mean θ, that is, $q_t = \theta + \nu_t$ where ν_t is an i.i.d. $N(0, \sigma^2)$ shock. The mean level itself is unknown to her though she has normal priors over it with mean $\mu_t \equiv E_t(\theta)$ and variance $x_t \equiv V_t(\theta)$. Maximizing $E_t[\ln \pi_t]$ implies the entrepreneur's best action is simply her expected value of q_t, $\phi_t = \mu_t$, while labor is demanded in line with its marginal product, $l_t = (a_t/w_t)^2$. Together these choices yield the maximal expected return $E_t[\ln \pi_t^*] = 2 \ln a_t - \ln w_t - (x_t + \sigma^2)$. Evidently the tighter the entrepreneur's prior over θ, that is smaller is x_t, the higher the expected return from entrepreneurship. This is why smaller values of x are akin to better business skills.

The only market that needs to be cleared is that for labor. Aggregate labor demand is $m_t l_t = m_t (a_t/w_t)^2$ and aggregate labor supply $(1 - m_t)h_t$ since each individual inelastically supplies a unit time. It follows that the market-clearing wage rate is $w_t = a_t[m_t/\{(1 - m_t)h_t\}]^{1/2}$, increasing in the share of the entrepreneurs in the population (m_t) and directly proportional to the productivity of technology (a_t). Labor earnings, $w_t h_t$, are increasing in h_t as expected.

Production and Transmission of Human Capital

Now turn to formation of human capital. Each individual starts her adult life with a vector of human capital in the two occupations acquired during childhood from the previous generation. Based on that vector, she chooses an occupation. Subsequently, an entrepreneur's income depends only on her business expertise x_t, a worker's depends only on her labor productivity h_{t-1}.

An entrepreneur, through her lifetime experience, gains a better understanding of running a business. This Bayesian learning produces a posterior variance $x_{t+1} = F(x_t) \equiv \sigma^2 x_t/(\sigma^2 + x_t)$ that she then tries to pass on to her offspring. A worker, on the other hand, can further her human capital prior to working. Specifically, she can invest s_t resources in additional skills at the average cost $\varphi w_t > 0$, which depends on the wage rate to account for opportunity and tuition costs that are not being explicitly modeled. This produces human capital according to the technology, $h_t = s_t^{\lambda} h_{t-1}^{\chi}$, where $\lambda, \chi \in (0,1)$ and $\lambda + \chi < 1$. Factoring in the optimal level of skill investment, this means the worker's effective productivity is $h_t = G(h_{t-1}) \equiv (\lambda/\varphi)^{\lambda/(1-\lambda)} h_{t-1}^{\chi/(1-\lambda)}$. Both human capital production functions, F and G, are increasing and concave. In the limit the two kinds of human capital converge to $(x_\infty, h_\infty) = (0, \bar{h})$, the fixed points of F and G respectively. It is reasonable to assume that $\underline{h} < \bar{h}$.

This brings us to the intergenerational transmission of human capital. Within-family transmission is, of course, the centerpiece of the Beckerian approach, where the family environment is a key influence on the development of skills and attitudes among children. Departing slightly from the Beckerian tradition, suppose within-family influence is imperfect: children do not always acquire the human capital their parents intended. When within-family transmission fails, the child acquires the human capital – through observation and imitation – of a randomly matched working adult who may well be in an occupation different from her parent's. Vertical (parent to biological child) and oblique (parent to cultural child) transmission of this sort has been introduced into economics through Bisin and Verdier's (2000) influential work. Oblique transmission, in particular, creates the possibility for social influence to directly matter for intergenerational outcomes. In contrast to Bisin and Verdier's work, it is human capital that is affected here, not preference.

Within-family socialization takes place after production and income generation. A parent expends effort $\tau_t \in (0,1)$ towards her biological child in order to transfer her human capital. The cost of doing so, $\psi(\tau_t)$, is increasing and convex in the effort. The parent evaluates the benefit of this transmission based on her perception of the child's welfare in her occupation relative to the alternative one. To be specific, the parent calculates her child's income based on her own business and labor earnings. Secondly, parents dislike the possibly that their children may be in a different occupation. Working parents also have an occupational bias, $\delta \geq 1$, because of which they view wage-work more favorably and, conversely, entrepreneurship less so. This is meant to reflect a general anti-capitalist attitude among some population groups in developing countries, possibly from the experience of colonization, post-colonial policies, or cultural practices. The bias may come to be widely shared over time through the transmission of human capital and occupational choice.

Denote by V^{ii} an occupation i parent's perceived benefit, based on her own experience and human capital, of her child choosing occupation i and by V^{ij} of choosing occupation j. Then one possible set of altruism payoffs

are: $V_t^{ww} = \ln(w_t h_t)$, $V_t^{we} = 2\ln a_t - \ln w_t - (\bar{x} + \sigma^2) - \ln \delta$, $V_t^{ew} = \ln(w_t \underline{h})$ and $V_t^{ee} = 2\ln a_t - \ln w_t - (x_t + \sigma^2)$. When within-family socialization fails to transmit the parent's human capital, which occurs with probability $1 - \tau_t$, the child automatically takes on the human capital of a randomly matched economically active adult, her cultural parent. Equilibrium effort from each type of parent increases, *ceteris paribus*, as that type becomes less numerous since social influence cannot be relied upon to mold children as parents would like and as the perceived welfare differential between the two occupations increases: $\tau_t^j = \tau^j(m_t, V_t^{ii} - V_t^{ij})$ with $\partial\tau^w/\partial m > 0$, $\partial\tau^e/\partial m < 0$, and $\partial\tau^j/\partial(V^{ii} - V^{ij}) > 0$. The anti-entrepreneurial bias δ conditions the transmission process. A higher value increases socialization efforts among working parents, as they have another reason to prefer that their children become workers.

The upshot of the socialization process is occupation-specific human capital being transferred through time. Generation-t working parents, all of whom are identical, transfer their labor productivity h_t to their biological or cultural offspring, whose uninformed business priors take the value $\bar{x}$. Entrepreneurial parents who are also identical, transfer their informed business prior x_t, their offspring's labor productivity taking the lowest value $\underline{h}$. Individuals do not accumulate the alternative occupation's human capital. If they become wage workers, they do not use their business expertise at all which therefore does not get sharpened. If they become entrepreneurs, on the other hand, they do use their expertise and learn from it but do not get an opportunity to hone their labor skills. Consequently, only occupation-specific human capital accumulated over time and through experience gets transferred to future generations.

Endowed with these human capitals, the child then makes an occupational choice by comparing expected returns (expected log income). As a cultural lineage builds up a history of entrepreneurship, it will have much higher business expertise relative to labor productivity than a cultural lineage of wage workers. Then a child successfully indoctrinated by an entrepreneur parent as part of a cultural lineage of entrepreneurs will have higher expected profits than one successfully indoctrinated by a worker parent as part of a cultural lineage of workers. This creates persistent occupational choice across generations in many cases. Workers pass on to their biological or cultural children dispersed priors and high labor productivity, creating future workers as those offspring will be worse at entrepreneurship. Entrepreneurs pass on tight priors and create future entrepreneurs by the same token.

Steady State

Focus now on the stationary equilibrium by imposing $a_t = a > 1$ for all t. Steady state requires that the two occupational and human capital types maintain constant proportions so that each type is investing the same socialization effort, $\tau^w = \tau^e$. The fraction of entrepreneurs whose children end up in entrepreneurship in steady state is the same as the fraction of workers whose children become workers. On the path to the steady state, these fractions are not constant but

there are conditions under which occupational choice is consistent with the human capital transfer. With each generation, the business expertise of entrepreneurs evolves toward perfect mastery of the technology and the productivity of workers evolves towards a high $\bar{h}$.

How does culture—the subjective anti-entrepreneurial bias δ and the directed parent-to-child transmission process—affect the steady-state supply of entrepreneurial talent and, therefore, risk-taking? Using the equilibrium wage equation, the steady-state fraction of entrepreneurs can be implicitly solved from the equation: $m[\ln(\bar{h}/\underline{h}) + \bar{x} + \ln\delta] + \ln[m/(1-m)] = \ln(\bar{h}/\underline{h}) - \sigma^2$. This steady state, call it $\bar{m}$, depends negatively on the anti-entrepreneurial bias and in appropriate ways on the three human capitals. That is, $\bar{m} = m(\underset{+}{\delta}, \underset{+}{\bar{h}}, \underset{+}{\underline{h}}, \underset{+}{\bar{x}})$.

Is this too little entrepreneurship? To answer, we need some notion of the socially desirable level of entrepreneurship. Consider the Benthamite social welfare function defined over consumption, $W(m) = mE(\ln\pi(m)) + (1-m)\ln(w(m)\bar{h})$, with the caveat that, since parents also care about their offspring, this cannot be a good measure of overall welfare. The level of entrepreneurship m' that maximizes W (subject to the participation constraints) turns out to be higher than $\bar{m}$ for plausible parameterizations. Inefficiency occurs and is maintained over time because human capital is partly acquired through purposeful, directed, transmission within the family. Moreover, the anti-entrepreneurial bias of worker parents intensifies the transmission of labor-specific human capital, making it harder for their children to become entrepreneurs. Therefore we can say that an anti-entrepreneurial cultural attitude, through its effect on human capital acquisition and the supply of entrepreneurial talent, lowers social welfare and national income.[2]

Growth through Technology Adoption

There is, of course, no growth in income in this steady state. An entrepreneurial culture, or the lack thereof, matters only for the level of output. Now imagine entrepreneurs having access to not one but multiple technologies that are distinguished by their overall productivity and human capital requirement.

Index the baseline technology specified above by $n = 1$. Suppose that technologies are ordered such that $\theta_{n+1} = \alpha^{1/2}\theta_n + \eta$ for $n \geq 1$, where η an i.i.d. $N(0, \sigma_\eta^2)$ shock and $\alpha \in (0,1)$. Moreover, the productivity of technology $n+1$ is a^{n+1} compared to a^n for technology n. Higher grade technologies are more productive but come at a cost: since $\alpha < 1$ and $\sigma_\eta > 0$, expertise in technology n does not transfer smoothly to $n+1$. This means even though upgrading technologies, one step at a time, increases inherent productivity, entrepreneurs with a lot of expertise in a given technology may be reluctant to sacrifice their specific knowledge. What happens, though, if entrepreneurs were to continuously upgrade, learn about the new technology and transfer that knowledge to their

2. The level of entrepreneurship that maximizes steady-state national income is $1/2 > m'$. For more on the dynamic adjustment to $\bar{m}$, see Chakraborty et al.'s (2014) related work.

biological or cultural offspring? Business expertise converges to a value $\hat{x} > 0$: no technology is fully mastered and expertise remains somewhat diffuse.

Entrepreneurs will choose not to upgrade so long as the expected profit from a given technology with a precise business prior exceeds the expected profit from a more advanced technology with a more dispersed prior. If so, an entrepreneurial class can emerge whose business expertise evolves to a perfect understanding of existing technologies. Ugrading to more productive technologies is never optimal because of proficiency with existing ones. This requires that agents act consistently with their socialization experience so that no one acquiring human capital in wage-work chooses to be an entrepreneur and vice versa. The latter is ensured if the initial demographics keep wages higher than expected business returns for a first-generation worker with the uninformed prior of $\bar{x}$ and expected business returns exceed wages for an entrepreneur who goes into production with the more informed prior of $\underline{x}$.

We could, with some increase in complexity but no substantive change in the model's outcomes, allow for a more general distribution of business priors. So long as entrepreneurs' priors were sufficiently tight to begin with, the outcome would still be a steady state with technological and economic stagnation. The accumulation of substantial skills over existing production methods leads to a sort of innovator's dilemma where entrepreneurs never find it optimal to make the costly move to more productive methods. It is here that culture matters. Through its effect on the intergenerational transmission of human capital, the anti-capitalism bias raises the supply of labor, lowers that of entrepreneurial talent. In doing so, it ensures that even before they acquire substantial expertise in existing production methods, entrepreneurs enjoy exaggerated profits that discourage them from "looking out for new ideas". The problem only worsens as they get continually better at existing methods.[3]

How can we generate economic growth, fueled by constant technology upgrading, in this economy? This can happen most simply if total factor productivity, a, were to increase sufficiently. Imagine that this happens through economic liberalization or the easier availability of new technologies in previously closed systems. Though entrepreneurs lose proficiency, the inherently higher productivity gain from the newer technology raises expected profits. They begin to upgrade, passing on to future generations the knowledge acquired from using newer technologies such that each successive generation too finds upgrading profitable. Workers, in turn, benefit from this as rising productivity raises labor demand. Wage incomes grow, in the limit at the (gross) rate a per generation, same as expected profits and national income.

The growing economy also moves closer to the efficient supply of entrepreneurial talent. Since entrepreneurs never fully master new technologies (recall

3. There can be some growth in this steady state as long as it is exogenous and common across all technologies. One example would be profits $\pi_t^n = \exp[-(q_{nt} - \phi_t)][2a^n b_t l_t^{1/2} - w_t l_t]$ from technology n, where $b_t = b_0(1+g)^t$ is the same for all n and $g \geq 0$.

that $\hat{x} > 0$), even though profits keep rising, the income differential between entrepreneurship and wage-work narrows. Parents recognize this based on their own experience. So, when it comes to socializing their offspring, they are less compelled to transfer their occupation-specific human capital since the alternative occupation is no longer viewed to be as undesirable. With within-family transmission weakening, social influence takes on a more active role and family background matters less for occupational choice.

Culture is often slow to change compared to political and economic institutions (Roland, 2004). In the model, the behavioral change that follows from the productivity shock occurs purely from economic change and (bounded) rationality. In other words, culture at the individual level does not change—δ is the same as before—but cultural behavior towards offspring does. A more pro-entrepreneurial attitude, lower δ, would help of course. But it is not limiting: while the income level continues to depend on the culturally determined share of entrepreneurs, that share is now larger and the growth rate itself is independent of cultural factors.

What this illustrates is that even when certain aspects of culture are slow to change, significant economic change can make them irrelevant for long-run growth. And the possibility of growth ultimately fosters a more growth-oriented cultural environment.

Conclusion

We used a dynamic model of culture to identify how an anti-entrepreneurial bias affects society's appetite for innovation and risk-taking. The bias affects the intergenerational acquisition of human capital, resulting in too little entrepreneurship. That may, in turn, make entrepreneurs unwilling to adopt productive technologies and adversely affect economic growth. This state of underdevelopment can be overturned by a large enough productivity shock. The cultural bias itself does not change, the changing environment makes the bias easier to overcome. There is no *a priori* reason to believe, therefore, that culture matters for long-run development. This is not to suggest that culture never affects long-run development (see Doepke and Zilibotti [2013] for an example where it does) or that understanding the cultural context in which economic development occurs is not important (Klitgaard 1994), only that it may be secondary to the economic and political restraints on the productivity of poorer nations.

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