The Drums of Revolution: Expanded

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With the approaches of methodological individualism, rational self-interest, and incentives at the margin for foundations, I invite renewed attention to possibly one of the most relevant economic theories of 2021. I seek to communicate, clarify, and provide additional logical rigor to the presentation of this analysis based on the exposition of economist, Dennis Mueller. I believe I succeed while doing his work respect.

Consider an agent, i, determining whether to engage in revolutionary activity and how much time to commit if engagement is chosen. Possible benefits may seem to reasonably take place as follows: the status quo of society may be undesirable for the agent in some respect, and our forward-looking agent may anticipate benefits β_i if revolutionary activity obtains a certain societal goal. As economist and public choice theorist Dennis Mueller has presented in the past, the probability of benefits occurring may be considered as a function of the time i commits to revolutionary activity, t_{ir}, and the time all other revolution-choosing agents commit, $O_{ir} = \sum_{j \neq i} t_{jr}$, such that we may denote probability of success as $\pi(t_{ir}, O_{ir})$. Possibly, our agent i may furthermore receive distinct utility which occurs regardless of success from participating in revolutionary behavior, $U_t(t_{ir}, O_{ir})$.

Conversely, costs of revolutionary activity to agent i may reasonably take the following form: if caught and punished because of said activity, the agent potentially faces fine, imprisonment, or a possibility of death; all indicating expected utility loss, F_i. The probability of the agent being captured then, may be modeled as a function of the variables of t_{ir}, O_{ir}, and the combination of resources and time devoted by authorities and other opposition towards ending the revolutionary behavior, R. Thus, we may consider probability of capture as $C_i(t_{ir}, O_{ir}, R)$.

Assuming that time spent on revolutionary activity by the agent, i, tends to increase the probability of personal capture, that more time spent on revolutionary activity by everyone else tends to decrease the probability of the agent's capture (given short-run, relatively, "revolution-inelastic supply" of enforcement in many contexts), and that more authority and opposition resources

will generally tend to increase personal capture probability; we are granted partial derivatives:

$$\frac{\delta C_i}{\delta t_{ir}} > 0, \qquad \frac{\delta C_i}{\delta O_{ir}} < 0, \qquad \frac{\delta C_i}{\delta R} > 0.$$

A final cost to consider may then be the missing income i gives up as the opportunity cost of time spent on revolutionary behavior, or wt_{ir}. Net expected benefits (E_i) for i from choosing revolutionary behavior and committing some amount of time to the endeavor may then be modeled as:

$$E_i = \beta_i \pi_i(t_{ir}, O_{ir}) + U_i(t_{ir}, O_{ir}, R) - F_i C_i(t_{ir}, O_{ir}, R) - wt_{ir}.$$

Mathematically assuming that the set of possible values for net expected benefits of revolutionary activity for i possesses a maximal element (which must be true if possible net expected benefits form at least a preorder $[E_i, \geq]$), and assuming continuity of E_i over at least one maximal element purely for modeling simplicity, we have established necessary requirements for a first-order condition. Assuming E_i is a convex set, again for modeling simplicity, we then may assert E_i is concave relative to t_{ir} on the economic basis of diminishing marginal utility from personal revolutionary time spent. This has the necessary implication that:

$$\frac{\delta U_{it}}{\delta t_{ir}}$$

becomes less in absolute quantity than

$$F_i \frac{\delta C_i}{\delta t_{ir}}$$

as

$$t_{ir} \to +\infty$$

The tempering insight that, for most agents, change in t_{ir} is unlikely to non-negligibly affect $\beta_i \pi_i$ as O_{ir} grows large, completes the establishment of concavity and ensures a second-order condition.

Mathematically optimizing E_i with respect to t_{ir} then takes place as follows with partial differentiation of the net expected benefits equation:

$$\frac{\delta E_i}{\delta t_{ir}} = 0 \qquad \to \qquad \beta_i \frac{\delta \pi_i}{\delta t_{ir}} + \frac{\delta U_i}{\delta t_{ir}} = F_i \frac{\delta C_i}{\delta t_{ir}} + w.$$

The final equation of the above optimization becomes the condition that the agent i must satisfy to obtain the individually optimal level of revolutionary

activity that leads to the highest net benefits for i. The condition amounts to the conclusion that the share received by agent i of the marginal expected gain in public good benefits, β_i, plus the marginal personal utility or enjoyment of the agent both from an extra hour of revolutionary behavior must equal the added risk of capture plus the wage lost from not having earned a conventional market compensation that hour.

Revisiting the likely empirical result that O_{ir} will be large relative to t_{ir} for any substantial cases of collective revolutionary behavior, thus rendering the marginal change from t_{ir} to π_i and C_i negligible, Mueller points out that this simplifies the condition further to the following:

"Whether someone participates or not, and if so to what degree, thus depends almost solely on the purely personal satisfaction from participation in the revolutionary movement weighed against the foregone income from taking time away from market activity."

Applications and interpretations of the basic model are diverse and have been explored by theorists including Silver, Tullock, and Olson, among others. There are particular implications of the framework that prove more timely and worrisome, however, in explaining the U.S. unrest of the 2020s.

First, marginal risk of being captured, $(\delta C_i/\delta t_{ir})$, may (and I would even contend most likely in many contexts) shift downward with increase in the revolutionary activity of others according to theorists Gunning and DeNardo. This has the effect through the model of increasing the optimal level of revolutionary activity for agents and incentivizes agents to either engage in even more revolutionary behavior if they have already chosen to rebel, or start rebelling if they haven't chosen to already. Thus, there is potential for increases in revolution to feed into further increases endogenously and grow faster than we would otherwise expect. Additional personal utility from a "bandwagon effect" highlighted by Mueller as revolutionary activity grows and inspires may further add to this feedback loop.

As I wrote in the summer of 2020 and again, briefly, in January of 2021, the COVID-19 pandemic and subsequent unrest from both the Left and Right have led to fresh forces of revolutionary protest and violence that make the conclusions of this economic model and the necessity of understanding it more important than ever before.

Population-wide worsening mental health (from pandemic, lockdowns, and financial stress), the fact that more people across the country have already repeatedly joined waves of unrest both peaceful and non-peaceful (which lowers the risk of being caught or prosecuted for crimes in their midst as police resources are finite and slow to increase), increasing popular dissatisfaction with the federal government in general, and a number of smaller variables all have the possible effect in common of raising the quantity of time for revolutionary behavior at which "optimal" net expected benefit occurs through altering the left side of the equation, and thus, raising the quantity of revolutionary behavior that we can expect incentives to drive agents towards. The exogenous and endogenous inputs mentioned function by lowering the real or at least perceived risks of negative individual consequences and inflaming the passions of a

greater quantity of people who might otherwise not be engaging in revolutionary behavior.

Simultaneously: unemployment or lack of labor force participation, unemployment assistance, the long periods of relative isolation and limitation of substitutes for activities brought on by lockdowns, and stimulus preservation (or even spoiling) of the public during the precarious economy reduce the opportunity cost of engaging in revolutionary behavior and unrest. Financial assistance from the government combined with lesser and fewer wages to go around indicate that people "have less to lose" as a direct trade-off when they choose to go out for various forms of revolution or unrest. This increases the predicted "optimal" level of revolutionary time agents are expected to reach for by changing incentives through the right side of equation, and you guessed it, boosting the quantity of time spent pursuing revolutionary behavior.

Why does all this remain important? Utility maximizing individuals may be poised to increase their quantity of optimal revolutionary behavior quickly and perhaps in a strongly self-feeding manner based on the model dynamics. You can observe the potential evidence all too clearly in the BLM protests and summer riots, the MAGA storming of the capitol, and even European and other areas increasing in their revolutionary behaviors. I am passing no judgement on anyone and only attempting an analysis and sober explanation, by the way. These also may not be the only causes at all. Far from it. However, there are powerful forces governing political and economic behavior in this era that do not get their due attention from the mainstream news, or favor and investigation from a highly emotional and stressed public. The pandemic, the lockdowns, the riots, the protests, the storming of the capital: they are all more intimately and systematically connected than most people believe. It's no coincidence at all that these things have all happened at once.

The most obvious solution to revolution from the model... may bode more darkly for society as a whole if care is not taken. The strongest and most powerful tool for decreasing unrest? Increasing R: the resources and power of government and opposition to quell the various people of revolution. The potential implications of that solution for American liberty, security, and prosperity go far beyond this model and into possibilities for worse abuse and oppression that must never see the light of day.

Be on guard. This may get worse before it gets better, but do not give up hope. Knowing is half the battle.

Note: A special thanks to Dennis Mueller for introducing me to some of the most profound public choice theories to build on, and an even warmer, more personal thanks to economists Nicholas Snow, Michael Alexeev, and Bryan Caplan for driving my inspiration, fascination, dedication towards public choice as a field.