

Engineering National Development

How does one engineer change in an economy?

Presented by
Dr. Gene Leon
IMF Resident Representative, Jamaica

Jamaica Institute of Engineers
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Greetings.....It is a pleasure and honor to be invited to address the first luncheon of the Institute of Engineers for 2011 on the topic of National Development. National Development is a broad and all-encompassing subject. At the risk of sounding overly biased, I would like to state at the beginning that my remarks today are limited to the narrower topic of Engineering Change in an Economy. I posit that to do this, one needs sound economic policy or sound economic engineering.

We can begin with, what is an economy? How does it work?

An economy is an organic system comprising markets, institutions and rules of operation. Institutional units undertake transactions within a framework of incentives to improve their self interest. Because these outcomes may not be self-coordinating or may even be contradictory, there is a need for rules of engagement and regulations to shepherd the combined activities along a desired path. That role is performed by national authorities, and the desired path is typically defined as enhancing the national good through growth in output, strengthening the financial position of the government, improving the balance sheets of other units, enforcing rule of law, and improving living standards.

We can think of an economy as having two active drivers, the private sector and the government. The private sector can be thought of as an engine of raw power. Its true potential (for driving excitement) is dependent on the rigidity of the chassis and body used to house it, the fuel to fire it up, and the braking system to tame it. The government functions/drives in two capacities: creates the environment for the private sector to flourish, and steers the process. In attempting to influence the trajectory of the ship/ economy, governments:

- Play the passive role of providing the infrastructure through which the potential of the engine can be realized (that is, an enabling environment for the private sector to operate, e.g., taxation policy; low cost of setting up business);
- Play the active role of providing goods and services e.g., providing public goods or social benefits for specific sectors.

Economic policy can be viewed as the planning and implementation of actions to steer the ship/ economy on a particular path towards a particular destination. The objective is to apply the appropriate level or intensity of inputs so as to yield desired outcomes over time. For effective implementation, it is important to understand the transmission

mechanism linking inputs to outputs, and the accuracy or bluntness of the tools available to guide the steering effort. However, this can be a significant challenge, largely because:

- The individual units/ sectors are linked and there is incomplete information on the mechanism/ linkages, either in terms of magnitude, direction or precise timing (exact path resulting from implementation of policies)
- Individual units are subject to shock and also react to uncertainty about future outcomes in different ways.

For example, if the government wanted to use tax policy to influence the behavior of other sectors, it would not know in advance the precise magnitude and or timing of the reaction to the policy and what implication it would have on decision making within these sectors.

Even if the exact response path were known, shocks can derail the best laid plans. For example, a global shock may influence the manner in which policies filter through the economy. Consequently, government policy has to be seen as continuously steering a ship towards its goal or destination. This includes (a) looking ahead and deciding how to

navigate around potential challenges, and (b) taking corrective action for unforeseen events to maintain a track to the destination.

It must also be recognized that there are no dry runs in economics. Any policy implemented will bring us to a new starting point, whereas in engineering we are able to simulate and run experiments in a controlled environment.

What were the initial conditions?

To illustrate underlying principles of engineering change, we can consider the Jamaican economy and the StandBy Arrangement with the International Monetary Fund. To begin, we need an understanding of where Jamaica is today and how it got there:

- A chronic, persistent national savings deficit (17% GDP in 2007/08), mirrored by increased borrowing
- High debt (almost 140% GDP) and fiscal deficits (11% GDP in 2009/10) implied high risk premia on the international market
- High interest costs on debt reached 70% of revenue and left little fiscal space for investment in physical or social infrastructure

- A focus on government securities and short-term lending led to crowding-out of private investment
- Low average growth of 1% in last two decades was inadequate to absorb increases in labor force (concomitantly, both poverty and crime increased)
- An inefficient business environment (crime; corruption; slow judicial system; institutional weakness), high energy costs, and “non-frontier” technology highlighted lack of competitiveness
- With output declining in Jamaica’s major trading partners (the Euro Area, United States, and Canada) in 2009 (by 4.1 percent, 2.6 percent, and 2.5 percent, respectively), shutdown in capital markets, transactions with and output in Jamaica naturally declined. Exports fell by more than 50 %, and remittances, foreign direct investments, and government revenues were adversely affected. Thirteen (13) quarters of declining domestic output has tested business confidence, stretched households, and generated pressures on government revenues

So what are the desired outcomes? What is the destination?

- Sustained growth and increased employment
- Lower debt and fiscal sustainability
- Current account sustainability
- Sound financial sector
- Social stability

These outcomes share associations and may not be all attainable at the same time, resulting in the need for tradeoffs. Focusing on the goal of moving from low to higher growth, a topic of interest in Jamaica, the associations referred to can be viewed as tensions:

- To increase activity, either private sector needs to invest more now to demonstrate confidence about the future, or government needs to spend more
- For the private sector to invest, there needs to be an expectation of a reasonable rate of return, which may not exist when confidence is low

- Government spending needs to be financed; it can choose to raise taxes, generate savings from efficiency, from rationalization of activities or from re-prioritization of existing funds, or it can borrow. No one likes to pay more taxes; increasing savings may mean employing less resources or labor; and borrowing is likely difficult if debt levels are high
- If domestic or external borrowing is essential, the government will need to consider the costs and benefits in the short and long-term, not always an easy or consistent choice.

How do we achieve these objectives? What is the ship's route map?

The StandBy Arrangement with the Government of Jamaica is built on three key principles, aimed at reversing over the medium term the poor or unsustainable initial conditions. The principles are: -

- Fiscal pillar to generate fiscal sustainability
- Financial pillar to ensure financial stability
- Structural reforms: the facilitators to a strong foundation

Because of the continuous (and not fully known) reaction to policies implemented, as well as, unpredictable shocks we need to recalibrate often to maintain direction toward the goals. Under the SBA this happens every quarter when a mission team visits Jamaica. Using the analogy of the ship, an undersea earthquake (and resulting tsunami) would be a shock we cannot avoid but of necessity have to try to steer through.

In Jamaica's case, the Tivoli incursion and tropical storm Nicole were unforeseen events that required some recalibration, in this case allowing a lower surplus for this year while keeping an eye on the medium-term. In general, buffers can be established (or insurance purchased) to compensate for the impact of shocks. In the financial sector, for example, capital requirements have been increased under Basel II to require institutions to keep buffers to better handle times of financial stress. In engineering, a close parallel is engineering a tower to withstand tremors or wind gusts that historically have been predicted to occur with very low probability.

How far has the ship travelled? What are the present coordinates?

Fortunately, there have been some recent improvements

- Financials have improved since JDX:
 - interest rates on securities are the lowest in decades;
 - loan rates are declining, although slowly;
 - the national currency is trading in a narrow corridor since its appreciation in the middle of last year;
 - GOJ foreign bond spreads have narrowed;
 - financial sector risks appear contained
- Structural reforms and ongoing programs of International Development Partners, such as the World Bank, Inter-American Development Bank and IMF have started to take root (include: tax administration and customs modernization; Central Treasury Management System; inner city basic services for the poor; Rural Education Development Initiative; initiatives to fight crime and redevelopment of downtown Kingston).
- But real sector indicators have lagged :

- initial public sector contraction was not compensated for by the private sector;
- however, the rate of decline in output has slowed: tourism, mining, and agriculture are improving

One year after the initial policy intervention, there is clearly scope to review outcomes relative to the initial goals and consider whether and how further policy interventions can steer the economy closer to all the initial goals set. That process is iterative, and allows the policy maker to be able to compensate for incomplete knowledge, for errors, and for unforeseen shocks.

Conclusion

In conclusion, the successful implementation of economic policy requires more than just a policy design. Like steering a ship across stormy seas, economic engineering is not an easy or trivial task. In economics, (and, in general, in the behavioral sciences), however, is that reaction to uncertainty is not uniform across units or even over time by the same units. This poses various challenges:

First, it is clear that the path chosen will hinge on the starting position. A country that is booming does not need the same thrust as one mired in a recession, in much the same way that it take less power to keep a car moving at a constant 60 mph than it requires to accelerate from zero to 60 mph. Second, the activities of each sector will affect the economy in different ways and will also have an impact on the behavior of the other sectors. Third, the activities undertaken by each impact the broader economy, consequently, to steer the country to its desired outcomes, the roles should be complimentary. Results are best when all sectors know the desired destination/ outcome, understand the path to be taken, prepare for the unexpected and adjust in a manner that will achieve that shared national vision.

To use another analogy, building a physical structure is a shared responsibility, with uncertainty at all phases. Is the engineering design sound? If it is, is the contractor following the design? Are the suppliers of the inputs providing exactly what is required? Are the trades people doing the work according to specifications? In like manner the institutional units within an economy must work together to achieve the desired objectives. But we do not know the exact manner in which all the

sectors interact, so a huge challenge is how to design regulations to circumscribe behaviors or to create environments with incentives that modify behaviors or influence activity. I hope I have convinced you that this is no easy task.

Thank you.