



KHAZANAH  
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MEGATRENDS  
FORUM 2015



## KMF2015 Primer

5th and 6th October 2015

Capital and labour inputs  
can raise countries out of  
poverty and transform them  
to middle-income status,  
but only by **Innovation** can  
an economy make the leap  
from a middle-income  
nation to a high-income  
nation

# Total Factor Productivity is the Driver of Long Term Growth

## TFP is the only driver of sustainable long-term growth

If the global economy were a giant sausage machine, Total Factor Productivity (TFP) would be the “secret sauce” that makes  $\$1 + \$1 = \$3$

**Capital \$1**  
Capital-intensive economies, e.g. Malaysia

**Labour \$1**  
Labour-intensive economies, e.g. India

**\$3 Output**

Source: KRIS

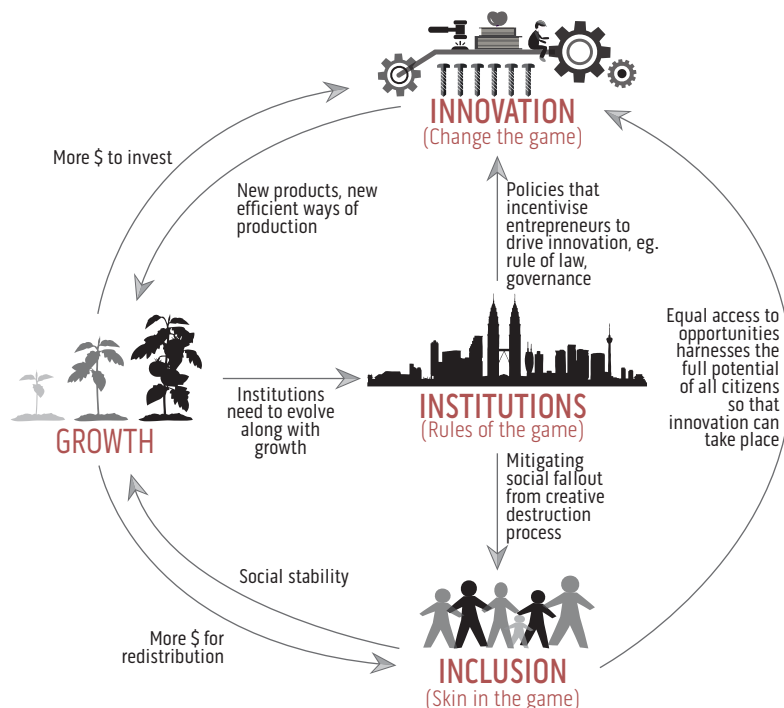


**TFP**  
Measure of an economy's long-term technological progress

Productivity-driven economies, e.g. Korea, Taiwan

**GDP = Consumption + Investment + Govt. Spending + Exports - Imports**

## TFP is driven by innovation and supported by institutions and inclusion



Source: KRIS

- TFP fuels sustainable long-term growth; it surpasses capital and labour inputs in its contribution to the quality and efficiency of output.
- Capital and labor input can raise countries out of poverty and transform them to middle-income status (Mexico, Malaysia, China, Brazil) but only by innovation can an economy make the leap from a middle-income to high-income nation (South Korea, Japan, Greece, etc).
- Since TFP represents an economy's long-term technological progress and dynamism, innovation in this context is key to maintaining TFP growth. Thus, what got us here won't get us there.

# Innovation can have Significant Unintended Consequences

Innovation comes in many forms and has created winners and losers throughout history



Invention of large ocean faring warships

WINNERS



Western European powers finding a sea route to the East to gain control of trade

LOSERS



Middle Eastern & Silk Road traders



Web-based learning and education

WINNERS



Users, free access to information, students, knowledge seekers

LOSERS



Encyclopedia Britannica, Universities, Traditional learning methods



The Steam Engine

WINNERS



Transportation, Agriculture and Manufacturing, Rise of world superpowers.

LOSERS



Horse carriage, horse cargo

NETFLIX

You Tube



Spotify

Online audio and visual streaming

WINNERS



Consumers as content providers, aspiring artists

LOSERS



Traditional media platforms: televisions, radios, cd's

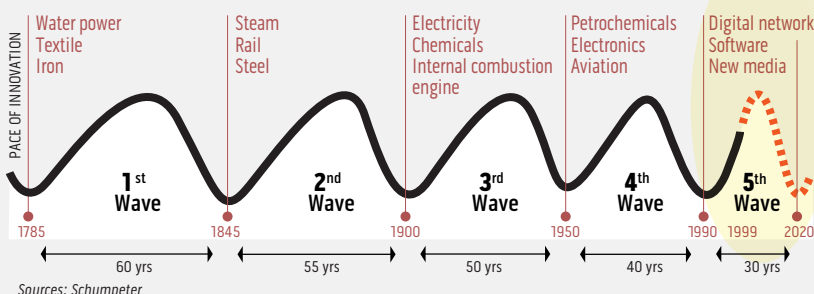
- New discoveries and innovations have occurred throughout every period of history, and are continuing to emerge today.
- These innovations result in both 'winners' and 'losers'. The winners disrupt the losers, sometimes to the point of obsolescence, and sometimes destroying entire livelihoods in the process.
- Innovation can reduce corporate profit pools leading to shorter corporate life spans (S&P 500 companies average life span; 1900s: 60 years, Today: 18 years). Examples include Kodak, Blockbuster, Xerox, Borders.



# Innovation is Evolving Exponentially

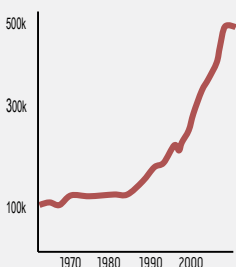
Long term technological waves are getting shorter

## The Schumpeterian Cycle of Innovation and Entrepreneurship

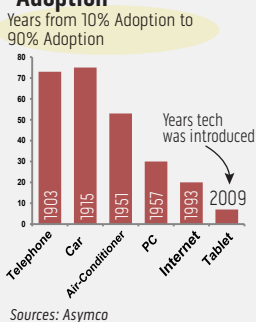


At the macro level, patent registration has increased exponentially, technological adoption is much faster, while, at the micro level, for instance, the cost of genome sequencing has decreased rapidly

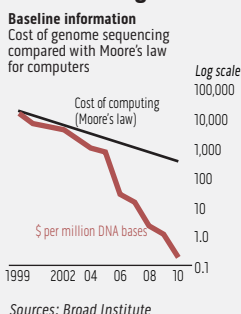
### Patents



### Adoption



### Pace of change



Technology has also vastly improved our standards of living

## Transport Then



## Transport Now



- Due to the accelerating pace of innovation, the exponential growth of disruption is also inevitable.
- Therefore, innovation and disruption are here to stay and resistance is futile. How we utilise that innovation ultimately determines whether we can achieve Creative Disruption or not.
- We need to optimally and ethically harness the power of Creative Disruption, wielding it to our purposes such that we can ensure the continuing growth of nations, firms and most importantly, people.

# Creative Disruption Enables Governments, Firms and People to Adapt

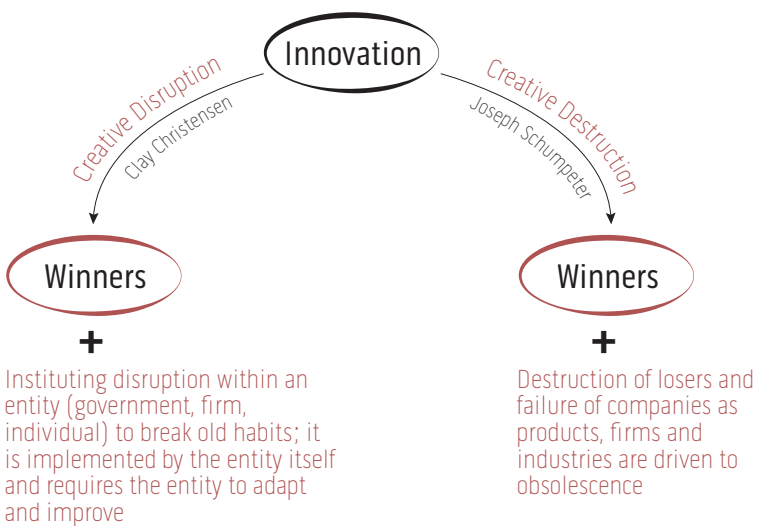
Creative Disruption must be differentiated from Creative Destruction

*Definitions:*

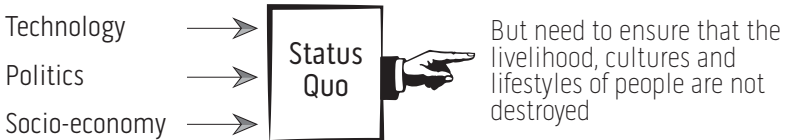
**Creative Destruction** by *Joseph Schumpeter in Capitalism, Socialism and Democracy*: A process by which new technologies, products, methods of production and means of distribution make old ones obsolete, forcing existing companies to rapidly adapt or fail entirely

**Disruptive Innovation** by *Clay Christensen in The Innovator's Solution*: Products that initially reached less profitable or non-target customers, but eventually reshaped entire industries as core customers change the way in which they perceive and value products

*Thus, Creative Disruption can be understood as changing the way core customers are valued, profit pools are restructured and even how entire industries are reshaped, but in a dynamic, creative and ethical manner*



## CREATIVE DISRUPTION

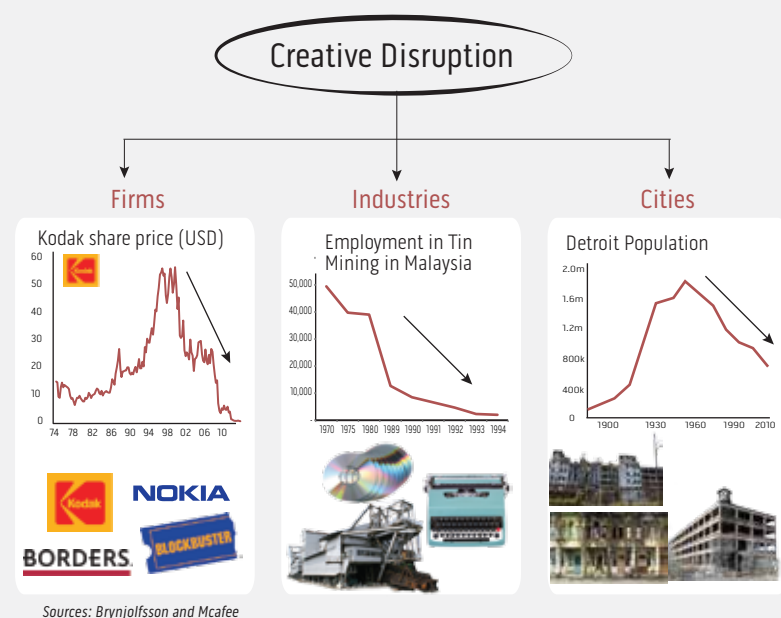


- While both processes result in winners and losers, the role of the public sector and private players is to maximise the benefits of innovation such that winners receive their rewards while costs to 'losers' are minimised.
- Disruption is necessary as adapting to the evolution of political, technological and socio-economic environments is crucial to thriving.
- Therefore, Creative Disruption must be differentiated from pure 'Creative Destruction' to avoid the total devastation and obsolescence that Creative Destruction can bring.

# Harnessing Creative Disruption by Unlocking the Power of Inclusive Innovation

Inclusive Innovation can ensure that the benefits of Creative Disruption accrue to all stakeholders

## Creative Disruption can be dangerous



To generate a robust innovation economy, need to balance desire for stability and security with the dynamic change that innovation brings



Hence, we need to unlock the power of Inclusive Innovation



MPESA  
Mobile Banking



Socket  
Energy ball



Polio  
Vaccine



Raspberry  
Pi Computer

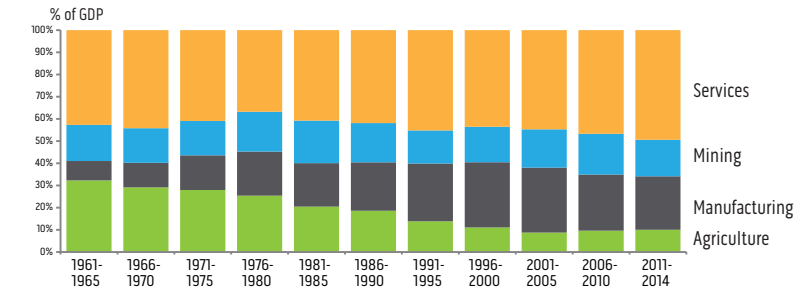
- Despite the benefits that Creative Disruption can bring, there are significant and potentially critical costs as well.
- We must harness Creative Disruption in an inclusive manner to counter its costs, such that its benefits profit all stakeholders, be they nations, firms, or people.
- Inclusive Innovation can be defined as “any innovation that leads to affordable access to quality goods and services for the poor on a sustainable basis and with extensive outreach,” with the common attributes of being lean, simple, clean and social.

## Inclusive Innovation

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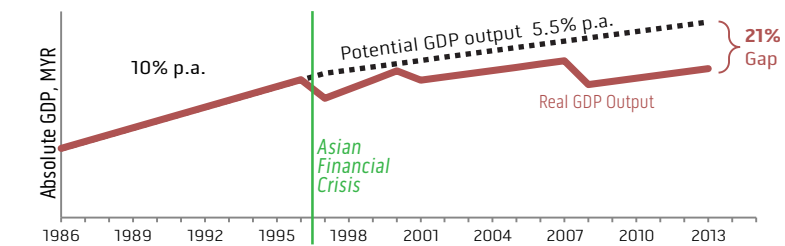
# The Malaysian Economy has Undergone many Structural Shifts

Malaysia has shifted from an agriculture-based economy to a manufacturing based economy to a services-based economy



Sources: World Bank

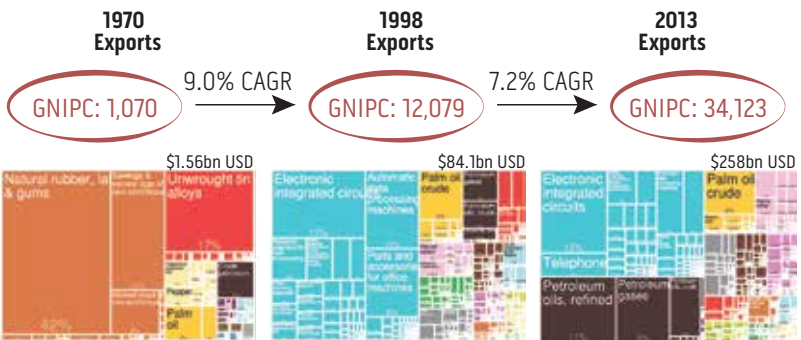
But growth has become sluggish since the 1990's with the output gap increasing



Sources: World Bank, KRIS

Note: 21% gap is as of 2013 - calculated using unrealised 5.5% growth assumption since AFC versus actual real GDP.

Malaysia's export structure has regressed to being more primary-commoditive dependent



Sources: "The Atlas of Economic Complexity," Center for International Development at Harvard University, EPU

Note: GNIPC - GNI Per Capita (RM)

Dutch disease in the making? Dutch disease, called the resource curse or the "curse of oil", is the damaging effect on an economy as a result of the exploitation and export of natural resources

- Malaysia's economic evolution was enabled by adopting technology from abroad, a common development policy strategy in many nations, as demonstrated by Cambridge economist Ha-Joon Chang.
- The transition from follower to leader, especially at the frontier of the innovation economy, is much more challenging and elusive.
- Economies need to diversify their goods and services to thrive — or even survive. Indeed, research by Professor Ricardo Hausmann finds that the diversification of a country's product space (complexity) is strongly positively correlated with national income.

# Disrupt, Lest ye be Disrupted: Lessons from Malaysia

The Tin Mining Industry is a clear example of how severe the effects of disruption can be

Tin Mining Industry



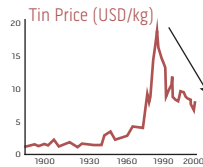
1979

63,000 tonnes  
41,000 employees



1990's

Aluminium  
& Plastic



1980's

Falling Global  
Tin Prices



1994

6,500 tonnes  
3,000 employees



To avoid the fate of the Malaysian Tin Mining Industry and to thrive, not just survive, firms must disrupt, lest they be disrupted. Examples of disruptive practices by organisations include:



Imagineering  
Institute: The lab  
conducts research,  
development and  
monetisation in...



Mixed Reality



Wearable  
Technology



Robotics



The MAB recovery  
plan aims to  
conduct a  
turnaround by...



Right-sizing the  
workforce



Picking a  
new leader



Resetting the  
business model



Esquel's vertically  
integrated  
operations ensures  
innovation in every  
step of the apparel  
manufacturing  
process such as...



Growing its  
own product



Wrinkle-free  
& Nanotech







Robotics in  
Production

- In 1979, Malaysia produced 63,000 tonnes of tin, accounting for 31% of global output and employing more than 41,000 people. By 1994, that production fell by nearly 10 times to 6,500 tonnes, with the industry now employing only 3,000 people.
- Creative Disruption has impacted Malaysian businesses in the past and at present, and will continue to do so in the future.
- To avoid being disrupted, companies themselves must harness Creative Disruption in their practices to optimise their chances for long-term survival and success.

# How do we Harness Creative Disruption?

There are three main sources of innovation: **performance-improving innovation**, **efficiency innovation** and **market-creating innovation**

	Performance-improving innovations (Incremental)	Efficiency innovations (Leaner)	Market-creating innovations (Transformational)
Government	 <p>Improving tax collection</p>	 <p>Reducing wastage</p>	 <p>New industrial policy</p>
Firm	<p>Toyota Camry 1983</p>    <p>Toyota Prius 2013</p>	<p>Paperwork</p>    <p>E-filing</p>	<p>Server mainframe</p>    <p>Cloud computing</p>
People	 <p>Continuing professional education</p>	 <p>Increasing efficiency via exercise, better time-management etc</p>	 <p>Learn a new monetisable skill</p>

Innovation is commonly thought of as creating something transformational. However, innovation can also be incremental and lean. The three main sources of value-added innovations are:

- **Performance-improving innovations** replace old products with new and better models.
- **Efficiency innovations** help companies make and sell products or services at lower prices, and is most related to operational efficiency.
- **Market-creating innovations** transform complicated or costly products so radically that they create a new class of consumers or market altogether.

# Balancing Adventure and Ethics to Unlock the Power of Inclusive Innovation

Undertaking innovation of all types (performance-improving, efficiency or market-improving) requires a spirit of Adventure and risk-taking



Marie Curie  
experimenting with  
radiation



Explorers in the Age of  
Discovery navigating  
unchartered waters

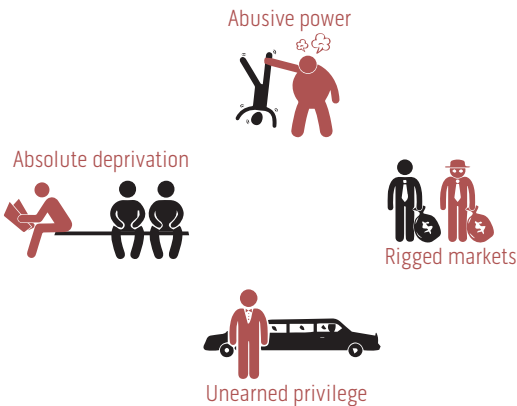


Apple co-founders Steve  
Wozniak and Steve Jobs  
dropping out of college to  
develop Apple

Furthermore, the capacity to innovate is available to more and more people, as long as they are adventurous enough to pursue it



Hence, we need to be cognizant of balancing Adventure with Ethics or else we face severe moral bankruptcy



Perhaps the most important principle of all is this: whatever we create, innovate or disrupt, in a world where we are **now increasingly limited by only our imagination**, we must also be limited by our conscience

- The ability to create and to change has never been accessible to so many. Yet, even if one understands the need for change, change is not easy. Hence, the importance of the spirit of Adventure.
- To unlock the power of Inclusive Innovation, we must balance the daring spirit of Adventure, so crucial to innovation, with the measured consideration of Ethics.
- Perhaps the most important principle is this: whatever we create, innovate or disrupt, in a world where we are now increasingly limited by only our imaginations, we must also be limited by our conscience.