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## Long-Run Sources of Economic Growth: A Regime-wise Analysis for Pakistan Economy

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# Introduction

- ◇ **Decomposition of Economic growth**
- ◇ **Determinants of total factor productivity**
- ◇ **In Pakistan case a very few studies**
  - **Burney (1986)**: decomposition of growth (1960 – 1985)
    - In 60s productivity is the main source
    - 1970s and 1980s factor accumulation is the main source
  - **Hussain (2010)**: analyze growth performance (1960 - 2004)
    - Productivity contribute substantially (31%)

# Main Contributions

- ◇ **Explicit Linkage b/w Regime – Productivity**
- ◇ **Incorporate Human Capital as an Additional Input**
- ◇ **Development of Human Capital Index for Pakistan**

# Terminology

- ◇ The term **'Regime'** here refers to political regime which may either be **Democratic** or **Autocratic**
- ◇ **Democratic Regime** means:
  - “If Chief Executive assumes power through *election* and *open competition*”
- ◇ **Autocratic Regime** refers to a *military regime*
- ◇ **Regime Change** means a regime **transit to or from democracy**
- ◇ **Economic Growth** means *growth of real GDP per capita*
- ◇ **Duration of a regime** means the *number of years a regime lasts*

# Time Line for Regime Change

1947	Independence from British Colony
1958	Regime Transited to Autocracy
1971	Regime Transited to Democracy
1977	Regime Transited to Autocracy
1988	Regime Transited to Democracy
1990	1 <sup>st</sup> Democratic Regime Change
1993	2 <sup>nd</sup> Democratic Regime Change
1996	3 <sup>rd</sup> Democratic Regime Change
1999	Regime Transited to Autocracy
2008	Regime Transited to Democracy
2013	Fresh Election Held

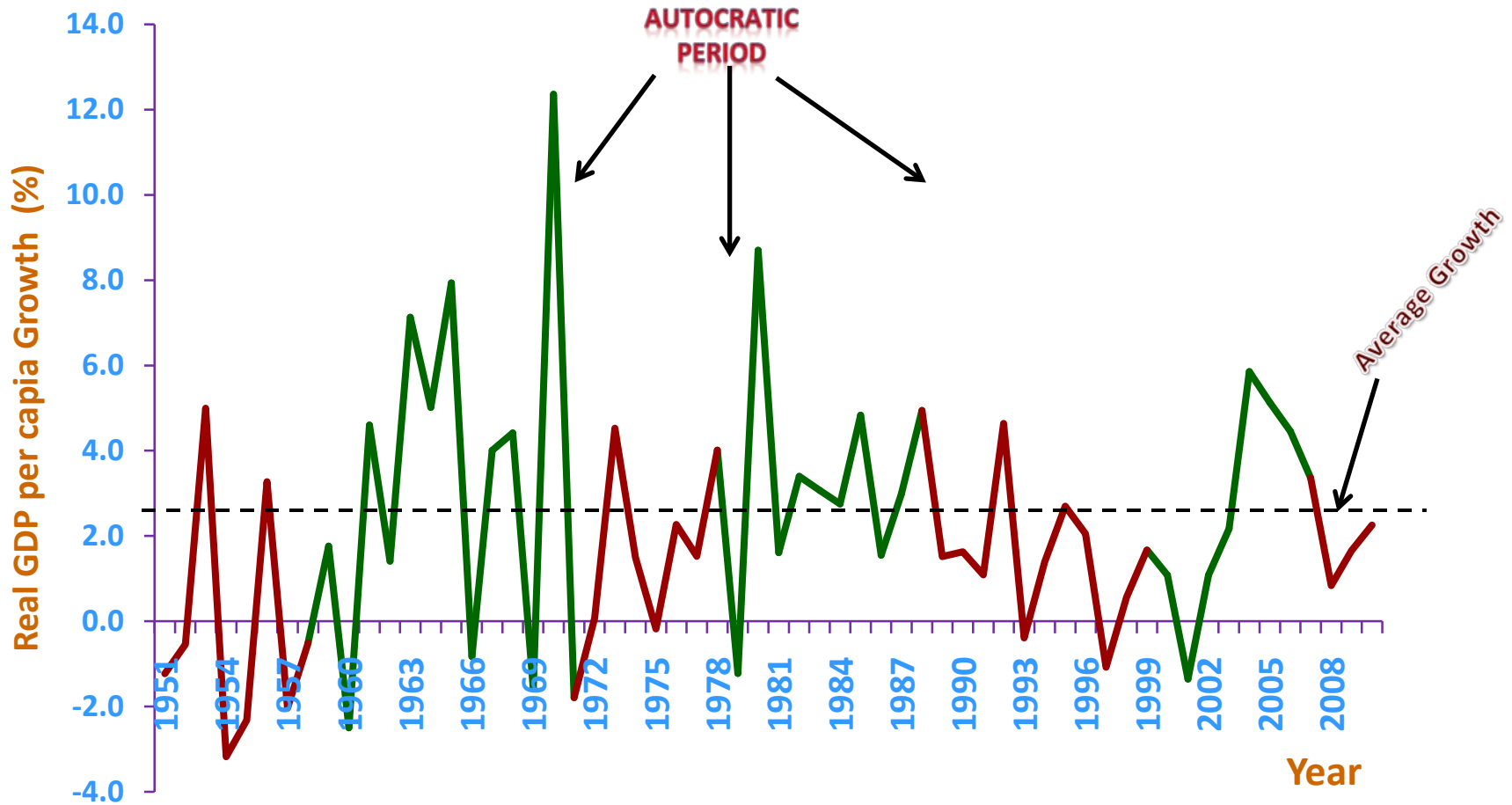
# Regime Duration

Regime	Type of Regime	Duration (Period)	Duration (Years)
R – I	Democratic	1947 – 1958	11
R – II	Autocratic	1958 – 1971	13
R – III	Democratic	1971 – 1977	06
R – IV	Autocratic	1977 – 1988	11
R – V	Democratic	1988 – 1999	11
R – VI	Autocratic	1999 – 2007	08
R – VII	Democratic	2007 – 2018	11

**Note:** If the chief executive assumes power through election and open competition, it is considered as democratic regime otherwise autocratic regime.

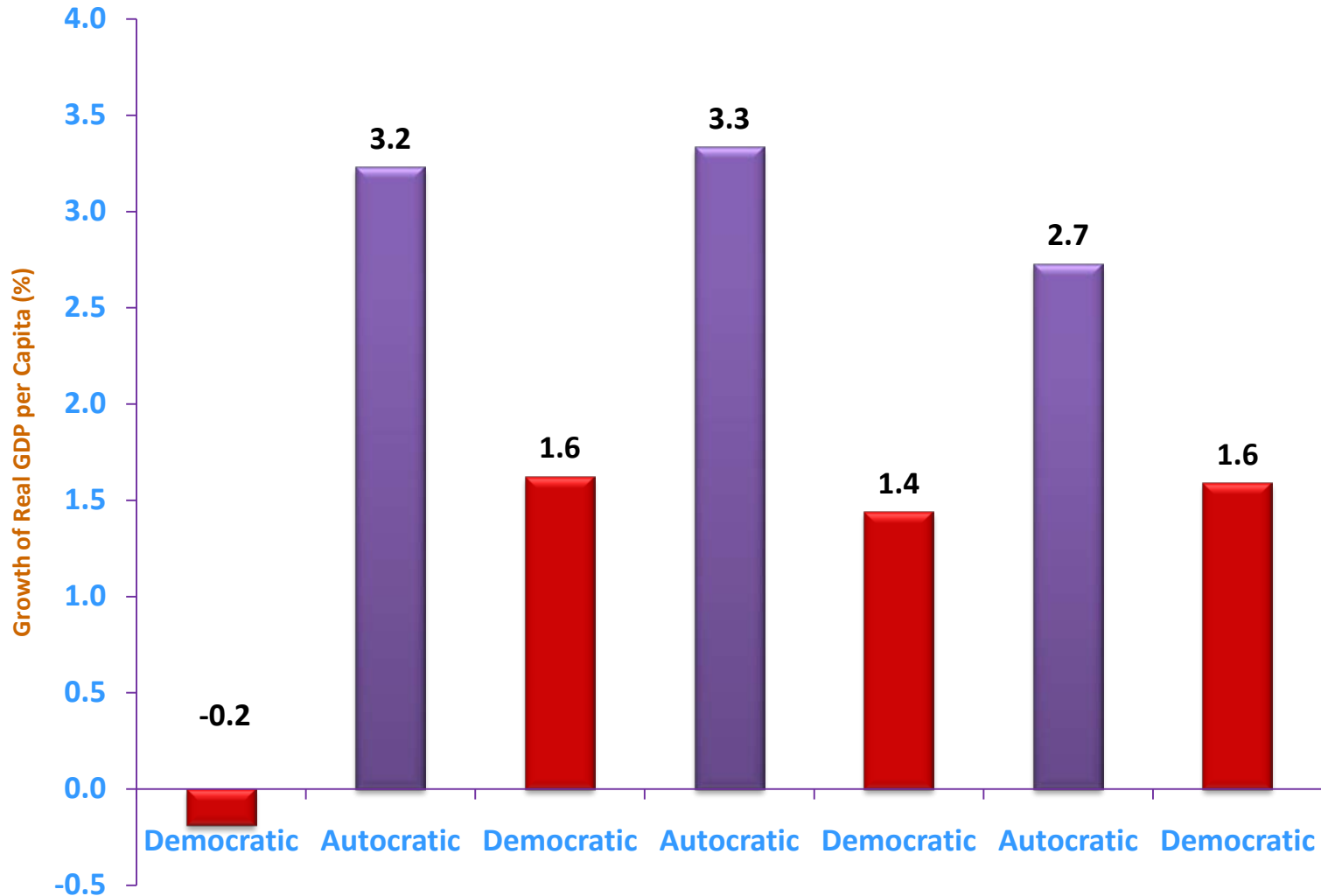
**Source:** Author's estimation

# Regime-wise Economic Growth

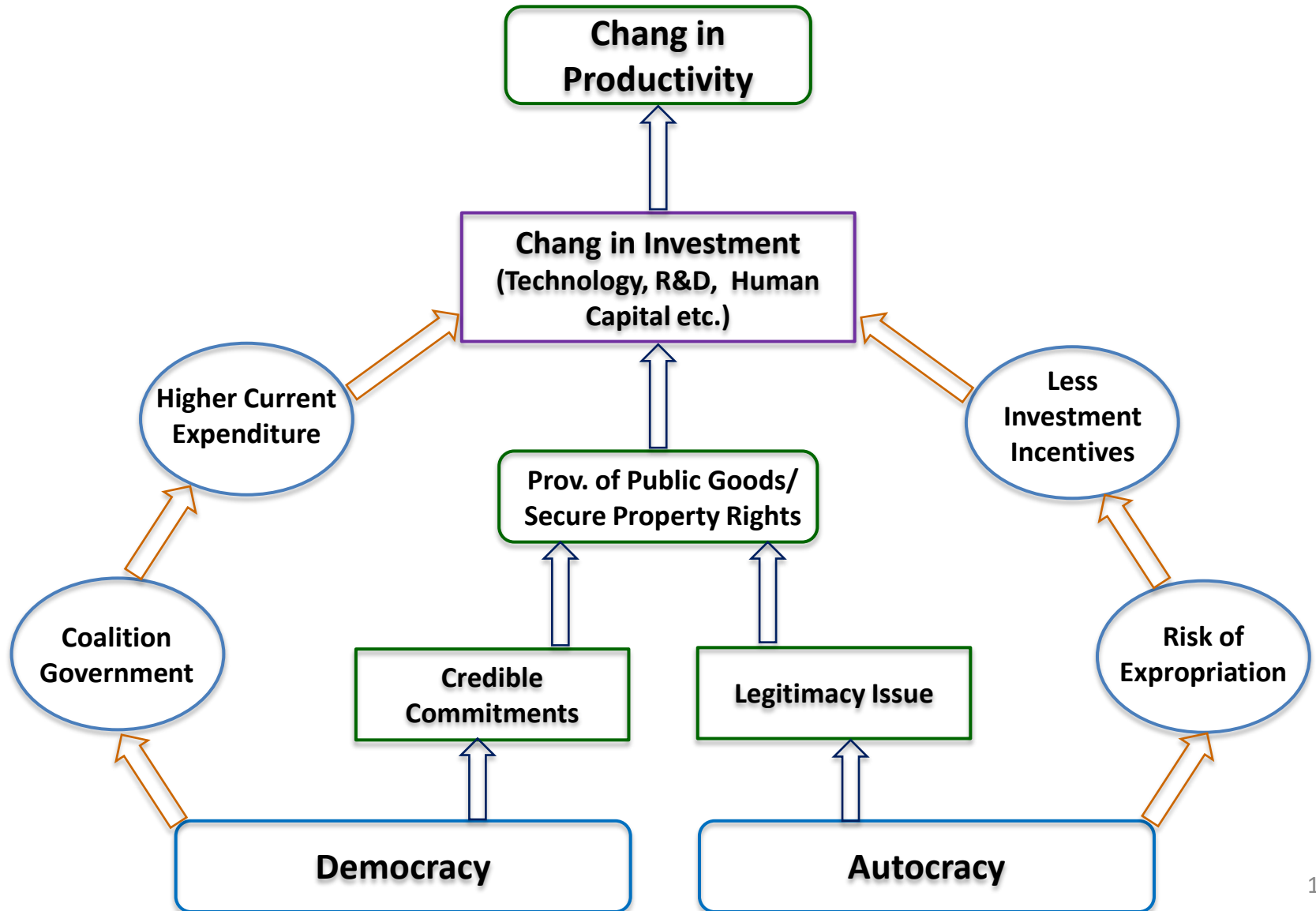




# Regime-wise Economic Growth



# Conceptual Framework



# Research Objective and Question

## ◇ **Research Objective:**

- To determine the main drivers of economic growth in Pakistan
- To examine the effect of change in political regime on patterns of economic growth
- To estimate the determinants of total factor productivity

## ◇ **Research Questions:**

- What are the main drivers of economic growth in Pakistan?
- How does change in political regime effect on patterns of economic growth?
- What are the determinants of total factor productivity?

# Research Hypothesis

- ◇ **There is a systematic difference between a democratic and an autocratic regime in determining productivity**

# Methodology

## ◇ Growth Accounting framework

$$g_A = g_y - [\varphi g_k + (1 - \varphi)g_h]$$

## ◇ Standard Econometric Approach

$$\ln(TFP)_t = \beta_0 + \beta \ln(X)_t + v_t$$

## ◇ Data Sources

- Penn World Table (Version 7.1 and 8.0)
- State Bank of Pakistan
- World Development Indicators

## ◇ Sample: Annual Time Series (1951 – 2010)

# Main Findings – Output Growth

(Percent)

Regime	Period	Output Growth	Labor Growth	Output per worker Growth	Labor's Contribution
<b>Full Sample</b>	<b>(1951 - 2010)</b>	<b>4.7</b>	<b>2.5</b>	<b>2.2</b>	<b>50</b>
<b>Democratic - I</b>	(1951 - 1957)	2.94	0.99	1.95	30
<b>Autocratic - I</b>	(1958 - 1971)	5.61	2.04	3.57	40
<b>Democratic - II</b>	(1972 - 1977)	4.06	2.28	1.78	<b>60</b>
<b>Autocratic - II</b>	(1978 - 1988)	6.50	2.91	3.60	40
<b>Democratic - III</b>	(1989 - 1999)	3.97	2.87	1.10	<b>70</b>
<b>Autocratic - III</b>	(2000 - 2007)	5.01	3.73	1.28	<b>70</b>
<b>Democratic - III</b>	(2008 - 2010)	3.97	2.87	1.10	<b>70</b>

*Note: If the chief executive assumes power through election and open competition, it is considered as democratic regime otherwise autocratic regime. Labor's contribution is estimated by ratio of labor growth to output growth.*

*Data Source: Feenstra, Inklaar and Timmer (2013).*

# Main Findings – Output per worker

(Relative Share)

Regime	Period	Physical Capital	Human Capital	TFP
<b>Full Sample</b>	(1951 - 2010)	0.2	0.3	<b>0.5</b>
<b>Democratic - I</b>	(1951 - 1957)	-0.2	0.1	1.1
<b>Autocratic - I</b>	(1958 - 1971)	0.2	0.1	<b>0.7</b>
<b>Democratic- II</b>	(1972 - 1977)	0.3	0.3	0.4
<b>Autocratic - II</b>	(1978 - 1988)	0.1	0.2	<b>0.7</b>
<b>Democratic - III</b>	(1989 - 1999)	0.3	<b>0.8</b>	<b>-0.1</b>
<b>Autocratic - III</b>	(2000 - 2007)	-0.1	<b>1.0</b>	0.1

*Note: If the chief executive assumes power through election and open competition, it is considered as democratic regime otherwise autocratic regime. Relative contribution shares are computed by ratio of input growth to per worker output growth. Data Source: Feenstra, Inklaar and Timmer (2013).*

**Democratic -**

**IV**

(2008 - 2010)

0.6

1.1

**-0.7**

# Main Findings – Growth Accounting

## ◇ Contribution in Output Growth

- Labor Growth 50% on average
- Higher under democratic regime

## ◇ Contribution in Per Worker Output Growth

- Productivity (50%)
  - Higher under autocratic regime
  - After 1994 - negative growth
- Shifted from productivity to human capital
- Ignorance of capital accumulation



# Empirical Methodology

## ◇ Econometric Model:

$$\begin{aligned}\ln(TFP)_t = & \varphi_0 + \varphi_1 \ln(Health)_t + \varphi_2 \ln(Life\ Expect)_t + \varphi_3 \ln(Schooling)_t \\ & + \varphi_4 \ln(Dev.\ Exp.)_t + \varphi_5 \ln(Gov.\ Spending)_t + \varphi_6 \ln(Privy)_t \\ & + \varphi_7 \ln(Export)_t + \varphi_8 \ln(Import)_t + \varphi_9 \ln(FDI)_t + \varphi_{10} \ln(FA\ Share)_t \\ & + \varphi_{11} \ln(Democracy)_t + \varepsilon_t\end{aligned}$$

## ◇ Endogeneity Issue

## ◇ Estimation Technique

- Least Square
- Feasible Generalized Least Square

## ◇ Spurious Regression

# Determinants of TFP

	1 <sup>st</sup> Lag of Explanatory Variables									
	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)
<b>Health</b>	0.065 <sup>a</sup> (0.021)	0.051 <sup>b</sup> (0.024)	0.052 <sup>b</sup> (0.024)	0.079 <sup>a</sup> (0.022)	<b>0.082<sup>a</sup></b> (0.024)	-0.003 (0.028)	0.037 (0.028)	0.055 <sup>c</sup> (0.027)	0.092 <sup>a</sup> (0.022)	<b>0.094<sup>a</sup></b> (0.021)
<b>Life</b>	2.353 <sup>a</sup> (0.301)	2.198 <sup>a</sup> (0.264)	2.113 <sup>a</sup> (0.343)	1.685 <sup>a</sup> (0.423)	<b>1.433<sup>a</sup></b> (0.390)	2.126 <sup>b</sup> (0.869)	1.917 <sup>a</sup> (0.377)	1.274 <sup>a</sup> (0.376)	0.886 <sup>a</sup> (0.281)	<b>0.915<sup>a</sup></b> (0.245)
<b>School</b>	-1.275 <sup>a</sup> (0.442)	-1.256 <sup>a</sup> (0.436)	-1.295 <sup>a</sup> (0.467)	-1.374 <sup>a</sup> (0.471)	<b>-1.271<sup>a</sup></b> (0.340)	-0.452 (0.466)	-1.074 <sup>b</sup> (0.492)	-1.293 <sup>a</sup> (0.452)	-0.518 (0.318)	<b>-0.545<sup>c</sup></b> (0.294)
<b>Dev. Exp.</b>		0.030 <sup>c</sup> (0.015)	0.030 <sup>c</sup> (0.016)	0.016 (0.018)	<b>0.052<sup>b</sup></b> (0.020)		0.042 (0.026)	0.042 <sup>c</sup> (0.023)	0.065 <sup>a</sup> (0.020)	<b>0.084<sup>a</sup></b> (0.022)
<b>Gov. Exp.</b>		0.033 (0.029)	0.033 (0.030)	0.068 <sup>a</sup> (0.025)	<b>0.086<sup>a</sup></b> (0.026)		0.069 <sup>b</sup> (0.029)	0.084 <sup>a</sup> (0.028)	0.133 <sup>a</sup> (0.031)	<b>0.151<sup>a</sup></b> (0.032)
<b>Privy</b>			0.013 (0.039)	0.030 (0.036)	0.052 (0.033)			0.087 <sup>c</sup> (0.045)	0.071 <sup>c</sup> (0.041)	0.025 (0.033)
<b>Export</b>				0.109 <sup>a</sup> (0.037)	<b>0.125<sup>a</sup></b> (0.032)				0.092 <sup>a</sup> (0.033)	<b>0.140<sup>a</sup></b> (0.033)
<b>Import</b>				0.005 (0.039)	0.020 (0.037)				-0.060 <sup>b</sup> (0.027)	-0.047 (0.029)
<b>FDI</b>				0.006 (0.004)	<b>0.016<sup>a</sup></b> (0.005)				0.005 (0.006)	<b>0.010<sup>b</sup></b> (0.002)
<b>FA Share</b>				0.002 (0.012)	0.010 (0.012)				0.021 (0.015)	0.018 (0.017)
<b>Democracy</b>					<b>0.014</b> (0.009)					<b>-0.003</b> (0.005)
Constant	0.001 (0.013)	-0.000 (0.011)	-0.000 (0.010)	0.002 (0.009)	-0.004 (0.007)	0.004 (0.048)	0.001 (0.012)	-0.002 (0.008)	-0.004 (0.004)	-0.003 (0.006)
<b>Diagnostic</b>										
<b>D – Watson</b>	2.10	2.12	2.13	2.08	2.05	2.40	2.20	2.12	1.84	1.82
<b>R<sup>2</sup></b>	0.58	0.64	0.66	0.78	0.76	0.15	0.59	0.76	0.94	0.95
<b>N</b>	51	51	51	50	50	50	50	50	49	45 <sup>18</sup>

# Conclusion and Policy Implication

- ◇ **Sources of Long – Run growth are mixed:**
  - Higher productivity in autocracy
  - Shifted from Productivity to Human Capital
- ◇ **Main Determinants of Productivity are:**
  - Investment in health facility, increase in life expectancy, public spending in development projects, foreign direct investment and exports of goods and services
- ◇ **Conclusion:**
  - In Short-Run: Regime matters
  - In Long-Run: No systematic difference

Thank  
You!