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December 2011

Online at https://mpra.ub.uni-muenchen.de/35820/
MPRA Paper No. 35820, posted 09 Jan 2012 09:51 UTC

Minimum Wage Legislation and Economic Growth: Channels and Effects

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This version: Dec. 2011

Abstract

Despite decades of experience and research, the effects of minimum wage legislation (MWL) on long-run economic performance have rarely been studied since Stigler's (1946) classic exposition about the shortcomings of MWL. In this study, we use a novel method to estimate the magnitude and transmission channels by which MWL affect productivity and GDP growth. Our results suggest that countries with MWL have a growth rate of about 20 to 30 percent lower than the sample mean. Although the initial impacts are small, in the 'steady state' where the marginal effect of the legislation years equals zero, a country will have a growth rate of about 30 to 38 percent lower than the average.

JEL Classifications: O12, O15, O38, O43, J58, I38, E02, D78, C52

Key words:
minimum wage, GDP growth, private investment, government size, government investment, population growth

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[1]The author wishes to express his gratitude for the financial support received from the Department of Economics, Hong Kong Baptist University. The supports from Kar-Yiu Wong and the capable research assistance of Ka-Yan Kung contributed to the research process. The earlier version of this paper was presented in The Sixth Biennial Conference of Hong Kong Economic Association, Tianjin, China, Dec. 18-19, 2010. I want to thank the comments and discussions from the audiences. However, the author is solely responsible for the contents of this paper and any errors herein.

1. Introduction

'Why, when the economist gives advice to his society, is he so often coolly ignored? He never ceases to preach free trade . . . and protectionism is growing in the United States. He deplores the perverse effects of minimum wage laws, and the legal minimum is regularly raised each 3 or 5 years.' -- George Stigler, cited in Rustici (1985).

According to the theory of regulation, the demand for and supply of economic regulation is not about the public interest at all, but is a process by which interest groups seek to promote their interests while politicians or governments seek to maximize their support or reduce the private costs they incur in their course of administration (for the classic discussions, see Stigler, 1971 and Posner, 1974). MWL has long been a controversial issue. Its supporters typically argue that it can reduce poverty and bring the income of the lowest-paid workers up to some acceptable standard. Most economists argue that it may price out low-skilled workers, discriminate against minorities, and cause unemployment to rise, and that it may not necessarily help the poor households it targets. Despite the ongoing debate over the merits of MWL, it is a politically attractive tool that politicians and governments can use to show their concern and support for reducing poverty and income inequality. It is popular, simple, and visible, does not require significant direct government expenditure in the immediate term, and does not entail costs for politicians. Politicians can thus use such legislation to win the support of specific interest groups and spread the potential social costs widely across the economy. Indeed, the costs of MWL may never be recognized since they may be fully realized only after decades have passed. Moreover, the costs to individuals may be so indirect, widespread and insignificant that the 'rational ignorants' dare not to understand and challenge such legislations. (Olson, 1965)

Since Stigler's (1946) classic exposition on the shortcomings of MWL, a substantial proportion of investigations and discussions have concentrated on its potential negative effects on employment, on the overall earnings of workers, and on the flow of workers between the formal and informal sectors, as well as its effectiveness in reducing poverty and income inequality. The literature about the methodologies, findings, issues, controversies, and debates on MWL are well-documented in Neumark and Wascher (2008). These investigations and debates center on the short-run and marginal effects of changing the minimum wage (MW) level. Despite the great volume of theoretical and empirical literature on the determinants of growth, few studies have sought to gauge the effects of this labor market regulation on long-run economic performance.

Decades of experience and research have yielded very little knowledge about its general impacts on productivity and economic growth, and the channels by which it influences these measures.

Our contribution to the literature on this relatively uncharted area is twofold. The first and most obvious one is our estimations on the magnitude of and the transmission channels by which MWL affect productivity and GDP growth with a novel method. To the best of our knowledge, this has scarcely been attempted before now. On a higher level, our findings demonstrate how a bad institution can sap the strength of a nation over time. Economic development and growth require 'good institutions': institutions that facilitate equal opportunities, competitions, innovations, and maximize the gains realized from the division of labor and exchange.[2] MWL effectively deprives the rights of the individuals with marginal productivity lower than the minimum wage to participate in formal job market. Moreover, the vested interest groups generated by such legislation will demand increasing protection and benefits by exerting political pressure on the government. They trigger competition between a diverse range of interest groups for government regulations and benefits. An increasing amount of resources are thus allocated to such interest groups under the influence of coercive power, resulting in declining growths in productivity, capital, and GDP over time. In the new MWL literature, there is a debate over how long it takes for MWL to have a full effect on labor market. (for instance, Neumark and Wascher, 2006) Our findings suggest that it takes decades for the full impact of MWL on economic growth to be seen and therefore, for its full effect on poverty and employment opportunities to be realized. Although the initial effects of MWL is small, at the 'steady state' where the marginal effect of the legislation years equals zero, a country will have a growth rate of about 30 to 38 percent lower than the average in the sample. Moreover, the effects of MWL are far more complicated and damaging than might be expected.

The rest of this paper is organized as follows. Section 2 presents the analytical framework for the empirical models and estimations. This is followed by a description of the data and statistics. Section 4 reports on our detailed empirical estimates and analyses based on a panel data set covering the period from 1970 to 1985. Section 5 attempts to see whether the main conclusions in Section 4 remain intact with the estimations based on the observations ranging from 1985 to 2004. The findings of our investigation are concluded in the last section.

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[2] For some classic discussions, see North (1981, 1990) and Olson (1982).

2. Analytical Framework

Following the framework developed in Mo (2000, 2001) which has been applied, modified or extended for various investigations with remarkable robustness, we use this novel method to estimate the effects of MWL on the growth rates of productivity GDP. The input-output relationship is characterized by a general production function of the form:

(1) $$Y = Tf(K, L)$$

where Y is the total output level, T is a total factor productivity index, and K and L are the endowment of capital and labor, respectively.

Total differentiation of Y gives:

(2) $$dY = fdT + T(f_K dK + f_L dL)$$

Dividing (2) by Y, we have:

(3) $$\frac{dY}{Y} = \frac{dT}{T} + Tf_K \frac{dK}{Y} + \frac{f_L L}{f} \frac{dL}{L}$$

Equation (3) states that economic growth in an economy is driven by the growth of capital and labor endowments, while the other growth determinants are captured by the growth rate of productivity. The equation can be expressed as equation (4):

(4) $$GR = F[\gamma, IY, dLL],$$

where GR and γ are the growth rates of real GDP and total factor productivity, respectively, IY is the investment output ratio, and dLL is the growth rate of labor. F_γ equals 1, F_{IY} is the marginal product of capital, and F_{dLL} is the elasticity of output to labor.

Based on the findings in the growth literature, productivity growth is determined by the initial level of real GDP per capita and the stock of human capital, such that:

(5) $$\gamma = \gamma(MWL, HUM, y0),$$

where MWL is the MWL variables, HUM is human capital and $y0$ is the initial GDP per capita; $\gamma_{MWL}, \gamma_{y0} < 0$; and $\gamma_{HUM} > 0$.

The focus of our investigation is the growth effect of the MWL variables that include whether and how long MWL have been adopted in an economy. General economic theory suggests that *MWL* has a negative effect on the rate of productivity growth as discussed in Section 1.

Schumpeter (1912, 1939) suggests that private investment is positively related to the growth rate of total factor productivity.[3] That is, $IY = IY(\gamma)$, with $IY_\gamma > 0$. Substituting (5) into (4), we have:

(6) $$GR = F[\gamma(MWL, HUM, y0), IY(\gamma), dLL]$$ [4]

The growth of total factor productivity not only drives GDP growth directly, but also affects the profitability of investment and therefore the investment ratio.[5] The total effect of *WLR* on the growth rate of real GDP is equal to:

(7) $$\frac{dGR}{dMWL} = \frac{\partial \gamma}{\partial MWL} + F_{IY}\left(\frac{\partial IY}{\partial \gamma}\frac{\partial \gamma}{\partial MWL}\right)$$

Equation (7) states that the total effect of *MWL* on the growth rate of GDP equals the summation of its effects on total factor productivity and on the investment ratio, weighted by the marginal effect of capital. All the relevant parameters in equation (7) can be estimated. For this purpose, we will estimate three sets of specifications, the first set being:

(8) $$GR = F(MWL, HUM, y0, IY, dLL)$$

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[3] For more detailed discussions, see Adelman (1961) and Mo (2000). Briefly, other things being equal, the higher the productivity growth rate, the higher the marginal product of investment that will induce higher private investment. Note that under this reasoning, *IY* is an individual choice variable driven by productivity growth while *GR* is the market outcome. There is no simultaneous problem between *IY* and *GR* although the coefficient of *IY* is highly sensitive to the control variables included in the regressions. Please refer to Mo (2007) for a detail analysis on the possible interpretations of the *IY* coefficients in the model.

[4] In reality, other than being driven by the growth rate of productivity, *IY* is also driven by exogenous variables such as cultural, institutional, demographic, regional, and historical factors at play in a particular country. Perfect collinearity between *IY* and the development variables will therefore not occur. While many factors can affect growth, missing variable problem will arise only when variables that are highly correlated with the *MWL* and have a substantial effect on economic performance are excluded. We can observe the robustness of our conclusions when various specifications are estimated in the empirical studies.

[5] Stock of human capital and per capita income tend to evolve very slowly. In a long duration, *y0* and *HUM* will be substantially affected by *GR* and γ. In this study with duration of five years panel, we assume that they are exogenous and tend to capture the basic socio-economic conditions of the countries involved.

Regressions based on equation (8), or equivalently equation (6), are used to generate the estimates of the marginal effect of capital and of the effect of the *MWL* on the growth of productivity. The second set is:

(9) $$IY = g(MWL, HUM, y0, dLL).$$

Regressions based on (9) provide the estimate of the effect of *MWL* on the investment ratio. Lastly, we will estimate:

(10) $$GR = H(MWL, HUM, y0, dLL).$$

Equation (10) is the reduced form of (8) and (9). The only difference between (10) and (8) is the absence of the investment ratio. Regressions based on (10) provide the estimate of the total effect of *MWL* on the growth rate. If the relationship of the estimates generated from (8), (9), and (10) matches the implication of equation (7), the remarkable coincidence suggests that the proxy for *MWL*, the quality of data in general, the validity of the analytical framework, and the empirical models are mutually supportive.

3. Data and Statistics

To ensure consistency and reliability, the data on *MWL* are mainly based on the minimum wage database of the International Labor Organization (ILO). Data taken from this database are then modified predominantly on the basis of information from the Organization for Economic Co-operation and Development (OECD). The dummy for MWL and the corresponding number of years it has been introduced are based on the date on which the minimum wage was introduced in the OECD database and/or the year of the earliest wage/labor legislation recorded in the ILO database. They should be considered as the proxy for *MWL* rather than precisely the duration of MWL has been in force.[6] Even for OECD data for which the term 'year of introduction' is used, this simply refers to the year in which the central features of the existing minimum wage system were put in place. However, the remarkable coincidences between the

[6] According to the reply received from the ILO office: "… The date of enactment of the respective law (in the database) can NOT be used as the date for the introduction of a minimum wage in a country. This is so, since several countries adopt new acts every year with an updated minimum wage, some revise their minimum wage system completely etc.." Since the ILO office does not hold data about the date minimum wage legislation was introduced in a country, we use the earliest date on which wage/labor legislations was recorded in calculating YRR. However, the OECD has clear data on OECD countries about the introduction date of minimum wage legislation. They are used to modify the ILO data to make the data a closer proxy for the *MWL*.

empirical results and theoretical implications suggest that the proxy does capture the negative impacts of MWL and related regulations on the average economic performances across countries.

There is clearly ample room for improving the MWL data by drawing on a more extensive range of information sources. However, our main conclusions remain intact when we compare empirical results based on four related data sets subject to different levels of modification taken from various sources. A comparison between the ILO data and the final proxy for *MWL* adopted in our regressions is reported in the Appendix Table A4.

Table 1: Correlations Coefficients and Descriptive Statistics

	GR	YRR	MWD	HUM	y_0	INVP	GINV	GSIZE	INSTAB	POPG	dHUM	ENR.P	ENR.H
GR	1												
YRR	-0.19	1											
MWD	-0.19	0.62	1										
HUM	-0.22	0.23	0.02	1									
y_0	-0.30	0.19	0.01	0.83	1								
INVP	0.23	-0.20	-0.30	0.36	0.35	1							
GINV	0.23	-0.10	-0.03	-0.32	-0.28	-0.16	1						
GSIZE	-0.08	-0.03	0.04	0.08	-0.10	-0.06	0.10	1					
INSTAB	-0.13	0.002	0.07	-0.21	-0.27	-0.23	-0.10	-0.05	1				
POPG	0.27	-0.08	-0.07	-0.68	-0.69	-0.30	0.39	0.06	0.13	1			
dHUM	-0.09	-0.05	-0.07	0.30	0.20	0.10	0.02	0.04	-0.06	-0.12	1		
ENR.P	0.08	0.07	-0.02	0.48	0.41	0.34	0.13	-0.10	-0.27	-0.33	0.13	1	
ENR.H	-0.31	0.13	0.11	0.06	0.04	-0.11	0.01	-0.03	0.01	0.04	0.003	0.07	1
YR	-0.31	0.13	0.10	0.13	0.14	-0.10	0.12	0.14	-0.0005	-0.05	0.12	0.08	0.67
ASIAE	0.30	-0.18	-0.13	-0.10	-0.23	0.21	0.09	-0.02	0.03	0.12	-0.02	0.04	0.04
LAAM	-0.20	0.10	0.05	-0.22	-0.24	-0.24	-0.06	-0.18	0.19	0.28	-0.06	0.02	0.15
OECD	-0.18	0.09	0.05	0.63	0.78	0.33	-0.30	-0.10	-0.21	-0.67	0.14	0.30	-0.13
SAFRI	0.03	-0.25	-0.22	-0.29	-0.31	-0.10	0.08	0.27	-0.02	0.28	-0.09	-0.25	-0.09
Mean	4.09	16.8	0.66	4.95	3753	0.16	0.08	0.17	0.09	1.77	0.45	0.94	1.83
(S. D.)	3.40	19.5	0.47	2.64	2865	0.06	0.05	0.06	0.18	1.08	0.55	0.13	3.16

Notes:
1. The above correlation coefficients are based on 203 observations.
2. GR = growth rate of real GDP in percentage; MWD = minimum wage legislation dummy; YRR = number of years having MWL recorded; HUM = average schooling years in total population over age 25; y_0 = initial real GDP per capita of each period; INVP = ratio of private investment to GDP; GINV = ratio of public domestic investment to GDP; GSIZE = ratio of government 'consumption' expenditure to GDP; INSTAB = measure of political instability; POPG = population growth rate; dHUM = percentage change in human capital; ENR.P =total gross enrollment ratio for primary education; ENR.H = total gross enrollment ratio for higher education; YR = dummy for time periods: 1=1970-1974, 2=1975-1979, and 3=1980-1984; ASIAE , LAAM, OECD, SAFRI = regional dummies for East Asian, Latin-American, OECD and Sub-Saharan African countries.

Insert Table 1 about here

The non-MWL variables are drawn from the data collection of Barro and Lee (1994). The comprehensive study is based on the data in the 1970-1985 period.[7] This period is divided into three 5-year periods to generate the panel data set used for our investigations in section 4. All the data used for empirical analysis matches closely the variables in the analytical framework. 'Average number of years of schooling among the total population over the age of 25' is used as the proxy for the level of human capital. Population growth rate is used as the proxy for the rate of labor growth. The annual growth rate of a variable is approximated by fitting the compound interest rate formula.[8] Government size is measured by the ratio of nominal government 'consumption' expenditure to nominal GDP in the data set, less the ratios of nominal government spending on education and defense to nominal GDP. The enrolment ratios, expenditure on public investment, and other variables are directly obtained from the Barro and Lee data collection.[9] The correlations among the major variables used in this study and their descriptive statistics are summarized in Table 1, with the variables defined in the notes to the table.

4. Empirical Specification and Result: 1970-1985

The higher the minimum wage, the greater will be the number of covered workers who are discharged. -- George Stigler (1946).

In this section, we report the estimations of the various specifications for the decomposition exercises according to equation (7). At the same time, the results of the different specifications can be used to assess the robustness of our conclusions. The estimations are based on the 1970-1985 sample period in the Barro and Lee data collection, which has been adopted extensively in various empirical investigations. The quality of the data set employed is also supported by the remarkable consistency among our empirical results and the theoretical implications as derived in section 2. In section 5, we assess the robustness of our major conclusions using data from the 'decades of turbulence' in the period 1985 to 2004. Our empirical

[7] To observe the robustness of the conclusions, supplementary empirical studies are conducted to the data in the period 1985-2004 which is reported in Section 5. The results in both periods are mutually supportive.

[8] For example, the annual growth rate in real GDP is estimated by finding r in the formula: $GDP70*(1+r)^5=GDP75$, where GDP70(75) is the real gross domestic product in 1970 (1975).

[9] The original sources of the observations and acronyms used in the data set are summarized in Appendix Table A2.

results show that MWL reduces productivity growth directly and indirectly through various channels. Moreover, the longer the MWL has been in force, the more destructive they are to an economy and the nations involved will degenerate over time.

4.1 Productivity and Investment Effects

MWL can have a negative effect on productivity and growth in many ways. Standard textbooks on labor market suggest that the legislation and associated labor market regulations create rigidities and reduce efficiency by setting minimum wages and extending collective agreements on unemployment, retirement benefits, and various other working conditions. Such regulations include limits on working hours, anti-discrimination laws, worker participation laws, 'employment protection' laws that restrict the employer's right to dismiss workers, transfer of undertakings laws designed to preserve wages and conditions when businesses are bought. These legislations restrict freedom of contract and raise both the risk of investment and the operating costs of businesses. Moreover, strong labor unions create additional rigidity that reduces the mobility of workers in the labor market. In a dynamic setting, MWL harms the interests of low productivity workers. The legislation places barriers to such workers in entering the labor market, makes it impossible for them to raise their productivity by gaining on-the-job experience, and frustrates their efforts to develop their careers and climb the social ladder. (among others, Neumark and Nizalova, 2006 and Hashimoto, 1982) In a welfare state, the unemployed groups become an increasing burden on the welfare system that can crowd out productive government expenditures. In less developed countries, groups that lack a means of subsistence and work opportunities endanger socio-political stability. In addition, recent findings suggest that MWL may make people increasingly reluctant to work and encourage them to rely on government protection and welfare. As observed by Cunningham (2007), social expenditures in many countries are tied to the minimum wage. Lindbeck and Nyberg (2006) and Michau (2009) conclude that an overly protective welfare state can lead people to invest less in passing on a strong work ethic to their children. In general, generous welfare policies and protective legislations foster a natural reluctance to work. The declining work ethic and deteriorating social norms generate adverse effect on economic performance over time. The vicious cycle of MWL, deteriorating social norms, lower growth and opportunities which in turn lead to increased political demands for more protective legislations can ultimately bring down a once vibrant market economy. Similarly, MWL can bring down marginal firms, raises the costs faced by new entrants, and reduces the profit of

surviving firms. They do not only reduce productivity and investment in the current period, but may also degrade the valuable social norms of wealth creation, risk taking, and innovation. This suggests that economic performance depends not only on whether a country has instituted MWL, but also on the number of years for which it has been in place. The longer the legislation has been in place, the higher overall damages caused by the 'cumulative distortions' on economic performance created by the vicious cycle

Tables 2M and 2Y report the estimations required for the decomposition of the productivity and investment effects of the MWL variables based on equation (7). Model 1 (M1, Y1) includes only the basic control variables, while model 2 (M2, Y2) includes all possible transmission variables investigated in this paper. These models are used to test the robustness of our conclusions under different specifications and the results are highly consistent with each other. The results shown in Table 2M suggest that countries with MWL have significantly lower private investment and economic growth. Based on the results reported in the estimation MAT, the existence of MWL in a country reduces the growth rate by about 0.834 percentage points on average, or about 20 percent lower than the mean growth rate in the sample period. According to the first order effect of the YRR, the YAT estimation indicates that an additional legislation year reduces GDP growth rate by about 0.05 percentage points.[10] The decompositions reported in Table 2D reveal that the theoretical implication of equation (7) and the related estimations is mutually supportive to each other. This add-up characteristic provides an additional observation that can be used to assess the robustness of the estimates and conclusions drawn from the estimations.[11] The decompositions indicate that private investment accounts for 45 to 65 percent of the total effect of the MWL variables on economic growth. This high collinearity between INVP and the MWL variables explains why the MWL variables become much less significant after INVP is introduced to the estimations as shown in M1P, MAP and YAP etc..[12]

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[10] Since the effect of YRR on GR is non-linear, the actual marginal effect depends on the number of years for which MWL has been instituted in a country. For instance, when evaluated at the mean of about 17 years, the marginal effect of YRR is: -0.0514 + 5.1N4 (17) = -0.043. Based on the estimates, the marginal effect reaches zero when YRR equals 50.4. The coefficient of MWD is the average partial effect of MWL on GR in the sample period, irrespective of the difference in YRR among countries.

[11] We do not have test statistics for the proximity of the calculated and estimated effects. Allowing for random errors in the estimation process, we consider the difference of less than 10 percent to be acceptable.

[12] Based on this understanding, although the estimated effects of the MWL variables on some of the transmission variables are statistically insignificant in the following estimations, we use the estimates in calculating the total effect in line with the reasoning in equation (7). Statistical insignificance can be explained by the absence of a functional relationship between variables. However, as indicated in the MAP and Y1P estimations, it may also be the result of the

Table 2M: Productivity and Investment Effect

Estimation	MAT	M1N	M1P	M2T	M2N	MAP
			Dependent Variables			
Indep. Var.	GR	INVP	GR	GR	INVP	GR
MWD	-0.834	-0.0385	-0.431	-0.943	-0.0354	-0.334
	(-1.79)*	(-5.20)***	(-0.92)	(-2.19)**	(-4.75)***	(-0.77)
y_0	-4.51N4	2.29N6	-4.54N4	-5.62N4	1.99N6	-5.96N4
	(-3.09)***	(0.99)	(-3.32)***	(-3.98)***	(0.82)	(-4.41)***
HUM	0.338	0.00363	0.151	0.342	0.00145	0.317
	(2.19)**	(1.48)	(1.03)	(2.06)**	(0.50)	(1.99)**
POPG	0.454	-0.00653	0.575	0.495	-0.00265	0.541
	(1.52)	(-1.39)	(2.05)**	(1.76)*	(-0.55)	(2.01)**
INVP			20.7			17.2
			(4.97)***			(4.31)***
GSIZE				-8.83	-0.0084	-8.69
				(-2.42)**	(-0.13)	(-2.48)**
GINV				7.33	-0.177	10.4
				(1.41)	(-1.96)*	(2.06)**
PINSTAB				-3.40	-0.0377	-2.75
				(-2.77)***	(-1.78)*	(-2.33)**
dHUM				-0.536	6.53N4	-0.547
				(-1.38)	(0.10)	(-1.47)
ENR.P				4.01	0.108	2.16
				(2.00)**	(3.10)***	(1.10)
ENR.H				-0.329	-0.00174	-0.299
				(-5.09)***	(-1.56)	(-4.80)***
Constant	3.65	0.174	0.857	2.54	0.0969	0.876
	(3.40)***	(10.2)***	(0.69)	(1.24)	(2.74)***	(0.440)
R^2	0.108	0.234	0.228	0.326	0.303	0.386
# of obs.	216	209	209	203	203	203

Notes:

1. For the definitions of the variables, please refer to the notes to Table A.
2. The expression - 4.15N4 equals - 0.000415 and so forth.
3. The regressions do not have equal sample size. For simplicity, we utilize the maximum number of observations available in the regressions. This is found to have no substantial effect on our conclusions.
4. Inside the parentheses are t-statistics. *, ** and *** following the t-statistics represents 10%, 5% and less than 1 % significant level respectively.
5. Based on the estimate in MAT, irrespective of its years of adoption, countries having MWL reduces GR by about 0.834 percentage point or 20.4 percent on average when evaluated at the mean.

multicollinearity problem, or the relationship is relatively small. Since the estimated results are consistent with the calculated results reported in Table 2D, we adopt the later interpretation. This understanding applies to the similar decomposition exercises conducted in the following subsections.

Table 2Y: Productivity and Investment Effect

Estimation	YAT	Y1N	Y1P	Y2T	Y2N	YAP
			Dependent Variables			
Indep. Var.	GR	INVP	GR	GR	INVP	GR
YRR	-0.0514	-0.00152	-0.0379	-0.0405	-0.00136	-0.0173
	(-1.67)*	(-3.10)***	(-1.28)	(-1.43)	(-2.75)***	(-0.62)
YRR^2	5.10N4	1.13N5	5.29N4	3.12N4	9.36N6	1.52N4
	(0.980)	(1.37)	(1.09)	(0.66)	(1.14)	(0.337)
y_0	-4.48N4	2.66N6	-4.6N4	-5.6N4	2.07N6	-5.96N4
	(-3.07)***	(1.14)	(-3.34)***	(-3.96)***	(0.84)	(-4.39)***
HUM	0.375	0.00542	0.156	0.400	0.00362	0.338
	(2.38)**	(2.15)**	(1.04)	(2.33)**	(1.21)	(2.05)**
POPG	0.517	-0.003	0.574	0.595	0.00118	0.575
	(1.71)*	(-0.63)	(2.03)**	(2.08)**	(0.24)	(2.10)**
INVP			20.6			17.1
			(4.98)***			(4.30)***
GSIZE				-9.49	-0.0342	-8.91
				(-2.58)**	(-0.534)	(-2.53)**
GINV				6.73	-0.197	10.1
				(1.28)	(-2.16)**	(1.99)**
PINSTAB				-3.47	-0.0407	-2.77
				(-2.83)***	(-1.91)*	(-2.34)**
dHUM				-0.594	-0.00141	-0.570
				(-1.51)	(-0.21)	(-1.52)
ENR.P				3.89	0.103	2.12
				(1.93)*	(2.95)***	(1.08)
ENR.H				-0.326	-0.00169	-0.297
				(-5.0)***	(-1.49)	(-4.74)***
Constant	3.31	0.150	0.866	2.22	0.0832	0.800
	(3.11)***	(8.85)***	(0.74)	(1.09)	(2.34)**	(0.40)
R^2	0.114	0.226	0.232	0.327	0.297	0.386
# of obs.	216	209	209	203	203	203

Note:

1. Please refer to the notes to Tables 1 and 2M.
2. Based on the estimate in YAT, the first order effect of YRR on GR equals 0.0514. The marginal effect of YRR reaches zero with $YRR^* = 50.4$. Evaluated at YRR^*, the reduction in growth rate equals 1.3 percentage points, or 32 percent when evaluated at the mean.

Table 2D: Direct , Investment and Calculated Total Effects

Model	Direct effect (a)	Investment effect (b)	Total effect (c)	c1/c2	b/c2
M1	-0.431	-0.0385 x 20.7 = -0.797	c1= -0.834 c2= (a)+(b) = -1.23	0.68	0.65
Y1	-0.0379	-0.00152 x 20.6 = -0.0313	c1= -0.0514 c2= (a)+(b) = -0.0692	0.74	0.45
M2	-0.334	-0.0354 x 17.2 =-0.609	c1= -0.943 c2= (a)+(b) = -0.943	1.00	0.65
Y2	-0.0173	-0.00136 x 17.1 = -0.0233	c1= -0.0405 c2= (a)+(b) = -0.0406	1.00	0.57

Notes:

1. The decomposition is based on equation (7) and the estimations reported in Tables 2M and 2Y.
2. The estimated effects and total effects are identical in Model M2 and Y2. The less than satisfactory results in M1 and Y1 are found to be due to the difference in sample size in MAT and YAT with their related estimations. After we control the MAT and YAT to have identical observations of 209 with the related INVP regressions as in MA1T and YA1T which are reported in Section 4.2, the estimated and calculated effects are almost identical. For simplicity and reducing the possibility of data manipulations, we do not control the sample size of all estimations. Only when deems necessary, we will re-estimate the model with controlled observations for comparison.
3. Although the estimates on the direct effects related to MWD and YRR are statistically insignificant as in MAP and YAP, we use the estimates for the decomposition exercises. We consider that they are the victims of multicollinearity or the effect is relatively small rather than their effect on the growth rate is actually zero. This treatment is supported by the fact that the calculated total effects are almost identical to the estimated total effects when related estimations have the same observations.

4.2 Effects on Government Size and Government Investment

The estimations reported in Tables 3M and 3Y are intended to investigate the effects of the MWL variables on economic growth through their possible influence on government size and government investment. These effects are then decomposed in line with the reasoning in equation (7) which are reported in Table 3D.

MWL directly increases and/or diverts government resources toward regulation and enforcement, thereby increasing the size of the government, rigidities and inefficiencies in an economy. Any increase in minimum wage has a large effect on other social expenditure in areas such as pensions and job training allowances and leads to changes in eligibility criteria for social programs and the number of beneficiaries. (Cunningham, 2007) The competitions for benefits may also divert resources from other public expenditures like government investment. However, the

effect of MWL on the government investment to GDP ratio may be mitigated due to its negative effect on the rate of GDP growth over time.[13]

Table 3M : Government Size and Government Investment

Estimation	MAT	MA1T	MGS.V	MGS.P	MGN.V	MGN.P
			Dependent Variables			
Indep. Var.	GR	GR	GSIZE	GR	GINV	GR
MWD	-0.834 (-1.79)*	-1.23 (-2.64)***	0.00511 (0.60)	-0.783 (-1.71)*	-8.11N4 (-0.13)	-1.22 (-2.64)***
y_0	-4.51N4 (-3.09)***	-4.07N4 (-2.82)***	-1.0N5 (-3.76)***	-5.51N4 (-3.71)***	1.77N6 (0.92)	-4.26N4 (-2.97)***
HUM	0.338 (2.19)**	0.226 (1.47)	0.0104 (3.67)***	0.441 (2.81)***	-0.00358 (-1.74)*	0.266 (1.73)*
POPG	0.454 (1.52)	0.440 (1.49)	0.00387 (0.71)	0.493 (1.67)*	0.0143 (3.62)***	0.283 (0.94)
GSIZE				-9.96 (-2.69)***		
GINV						11.0 (2.12)**
Constant	3.65 (3.40)***	4.45 (4.17)***	0.144 (7.31)***	5.08 (4.28)***	0.0617 (4.32)***	3.77 (3.41)***
R^2	0.108	0.135	0.0817	0.137	0.168	0.153
# of obs.	216	209	216	216	209	209

Notes:
1. MA1T is identical to MAT except the observations are controlled to be identical to the estimations MGN.V and M1P.
2. Please refer to the notes to Table 2M.
3. Based on the estimate in M1AT, MWL reduces GR by 1.23 percentage points or 30 percent when evaluated at the mean.

Table 3Y: Government Size and Government Investment

Estimation	YAT	YA1T	YGS.V	YGS.P	YGN.V	YGN.P
			Dependent Variables			
Indep. Var.	GR	GR	GSIZE	GR	GINV	GR
YRR	-0.0514 (-1.67)*	-0.0691 (-2.27)**	2.68N4 (0.48)	-0.0486 (-1.60)	-6.93N4 (-1.71)*	-0.0624 (-2.04)**
YRR^2	5.1N4 (0.98)	7.61N4 (1.49)	-7.95N6 (-0.83)	4.27N4 (0.83)	1.02N5 (1.49)	6.62N4 (1.29)

[13] With MWL in a country, the growth rate of government investment will be reduced when resources are diverted toward regulation and related social expenditures. However, MWL also causes the rate of GDP growth in the country to fall over time. This may explain why the GINV channel is of lesser importance in the decomposition MGN than in that of YGN, as indicated in Table 3D. The coefficient of YRR captures the marginal year effect of MWL, which has a smaller effect on the GDP level in the short term.

y_0	-4.48N4 (-3.07)***	-4.05N4 (-2.79)***	-9.92N6 (-3.71)***	-5.51N4 (-3.72)***	1.57N6 (0.81)	-4.2N4 (-2.91)***
HUM	0.375 (2.38)**	0.268 (1.71)*	0.0111 (3.83)***	0.491 (3.06)***	-0.00358 (-1.71)*	0.303 (1.93)*
POPG	0.517 (1.71)*	0.512 (1.71)*	0.00476 (0.856)	0.567 (1.90)*	0.0137 (3.46)***	0.378 (1.24)
GSIZE				-10.5 (-2.82)***		
GINV						9.73 (1.85)*
Constant	3.31 (3.11)***	3.96 (3.74)***	0.142 (7.28)***	4.80 (4.09)***	0.0677 (4.81)***	3.30 (2.98)***
R^2	0.114	0.137	0.0856	0.147	0.180	0.152
# of obs.	216	209	216	216	209	209

Notes:
1. YA1T is identical to YAT except that the observations are controlled to be identical to the estimations YGN.V and YGN.P.
2. Please refer to the notes to Tables 1 and 2M.
3. Based on the estimate in YA1T, the first order effect of YRR on GR equals -0.0691. The marginal effect of YRR reaches zero with $YRR^* = 45.4$. Evaluated at YRR^*, the reduction in growth rate equals 1.57 percentage points, or 38 percent when evaluated at the mean.

Table 3D: Government Size and Government Investment

Model	Direct effect (a)	Govt. expenditure channel (b)	Total effect (c)	c1/c2	b/c2
MGS (GSIZE)	-0.783	0.00511 x (-9.96) = -0.0509	c1= -0.834 c2= (a)+(b) = -0.834	1.00	0.061
YGS (GSIZE)	-0.0486	2.68N4 x (-10.5) = -0.00281	c1= -0.0514 c2= (a)+(b) = -0.0514	1.00	0.055
MGN (GINV)	-1.22	-8.11N4 x 11.0 = -0.00892	c1= -1.23 c2= (a)+(b) = -1.23	1.00	0.0073
YGN (GINV)	-0.0624	-6.93N4 x 9.73 = -0.00674	c1= -0.0691 c2= (a)+(b) = -0.0691	1.00	0.097

Notes:
1. In order to have the identical sample among related estimations, the total effects related to GINV are based on the estimates in MA1T and YA1T. For decompositions related to GSIZE, they are based on MAT and YAT as the related estimations have the same sample size.
2. The calculated total effects are identical to the estimated total effects.
3. The b/c in MGN is much lower than that of YGN. Please refer to footnote 13 for a possible explanation. The results in YGN suggests that an additional year of MWL reduces growth rate by 0.069 percentage points and the government investment channel accounts for about 10 percent of the total effect while the government size channel accounts for more than 5.5 percent as indicated in YGS.

Insert Tables 3M, 3Y and 3D about here

The estimations suggest that the MWL variables raise the government size and reduce government investment that result in lowering the rate of GDP growth.[14] The estimated and calculated effects are identical in the related estimations as indicated in Table 3D.[15]

4.3 The Political Instability Channel

The findings described in the above subsections suggest that MWL has a negative effect on productivity and economic growth. Moreover, most research indicates that MW has a sharp disemployment effect, particularly among teenagers (Neumark and Wascher, 2006, 2008). MWL therefore result in a reduction in personal development opportunities that is likely to lead to increased socio-political instability given the excess energy of the unemployed.[16] We consider this possibility in this section.

Insert Tables 4MY and 4D about here

Table 4MY: Political Instability

Estimation	MAT	MS.V	MS.P	YAT	YS.V	YS.P
				Dependent Variables		
Indep. Var.	GR	PINSTAB	GR	GR	PINSTAB	GR
YRR				-0.0514 (-1.67)*	4.69N4 (0.29)	-0.0531 (-1.79)*
YRR^2				5.1N4 (0.98)	-1.42N6 (-0.05)	5.67N4 (1.13)
MWD	-0.834 (-1.79)*	0.0120 (0.489)	-0.844 (-1.88)*			
y_0	-4.51N4 (-3.09)***	-1.92N5 (-2.49)**	-5.29N4 (-3.72)***	-4.48N4 (-3.07)***	-1.94N5 (-2.51)**	-5.26N4 (-3.69)***
HUM	0.338 (2.19)**	-0.00338 (-0.41)	0.269 (1.79)*	0.375 (2.38)**	-0.00419 (-0.50)	0.301 (1.96)*
POPG	0.454 (1.52)	-0.0150 (-0.95)	0.339 (1.17)	0.517 (1.71)*	-0.0166 (-1.03)	0.394 (1.35)
PINSTAB			-4.84 (-3.85)***			-4.81 (-3.83)***

[14] The estimations also indicate that government size has negative effect on GR while government investment vice versa. The results are consistent with the findings in Mo (2007).

[15] We use the estimates on the effects of WLR variables on government size and government investment in Tables 3M and 3Y although the coefficients are statistically insignificant. Please refer to footnote 12 for the reasons supporting the practice. The reasoning applies to all decompositions in the coming sections.

[16] Low economic growth may lead to political instability and therefore PINSTAB may have simultaneous problem in the growth regressions. However, Alesina et al. (1996) finds very weak evidence of this reverse causality. Rather than driven by the growth rate, socio-political instability is probability driven by the levels of inequality, corruption and general living quality. (for instance, Mo, 2000, 2001) Most of these effects are likely to have already captured by the variables such as y_0, HUM and MWL variables included in our specifications. The possible simultaneous bias may not be substantial.

Constant	3.65 (3.40)***	0.202 (3.52)***	4.99 (4.66)***	3.31 (3.11)***	0.210 (3.69)***	4.69 (4.39)***
R^2	0.108	0.0900	0.172	0.114	0.0906	0.178
# of obs.	216	214	214	216	214	214
Note: Please refer to the notes to Tables 1 and 2M.						

Table 4D: Political Instability

Model	Direct effect (a)	PINSTAB channel (b)	Total effect (c)	c1/c2	b/c2
MS	-0.844	0.0120 x (-4.84) = -0.0581	c1= -0.834 c2= (a)+(b) = -0.902	0.92	0.064
YS	-0.0531	4.69N4 x (-4.81) = -0.00226	c1= -0.0514 c2= (a)+(b) = -0.0554	0.93	0.041
Note: Related total effects are based on MAT and YAT.					

The estimations and decomposition suggest that the MWL variables do have negative effects on socio-political stability. They account for about 6.4% and 4.1% of the total effects of the respective MWL variables on economic growth.

4.4 School Enrolment and Human Capital

Theoretically, the effects of MWL on schooling decisions and human capital accumulation are ambiguous. According to Cahuc and Michel (1996), MWL does not necessarily have negative consequences for economic performance because it can induce greater human capital accumulation. A low level of demand for unskilled labor caused by MWL may create an incentive for workers to accumulate human capital in an effort to avoid unemployment. However, a higher MW can also discourage further education among the poor by enticing some of them to enter the job market.[17] Moreover, it is also possible that the lower levels of productivity and economic growth resulting from MWL reduce the expected benefits of education. Family education is highly complementary to formal education. Since poor children are endowed with lower family capital, they have a lower expected return from formal education. Poverty also raises the subjective discount rate of the future benefits because poor children will join the informal sector at an early stage or simply plan to live on welfare when employment opportunities are limited. In contrast, children from wealthy and middle-class family receive better family support and tend to remain in formal schooling for longer when it is difficult to find a good job or successful business ventures in a sluggish economy. People may also stay in school to accumulate human capital and to raise their productivity to a

[17] Please refer to the different possibilities and findings in related literatures detailed in Neumark and Wascher (2008).

level that exceeds the minimum wage. Ehrenberg and Marcus (1982) also find that MWL can have different effects on schooling decisions. For white male teenagers, MW reduces enrolments among low-income teenagers, but increases enrolments among high-income teenagers. The actual effects of MWL on schooling decisions and human capital accumulation can only be settled empirically. We estimate the effects of the MWL variables on schooling decisions and the change in human capital and assess their respective influence on economic growth.[18]

Table 5M: Education Enrollment and Human Capital

Estimation	MEP.V	MEP.P	MEH.V	MEH.P	MdH.V	MdH.P
			Dependent Variables			
Indep. Var.	ENR.P	GR	ENR.H	GR	dHUM	GR
MWD	-0.0104 (-0.65)	-0.793 (-1.74)*	0.722 (1.60)	-0.668 (-1.47)	-0.0559 (-0.76)	-0.850 (-1.82)*
y_0	2.89N7 (0.06)	-4.53N4 (-3.18)***	5.28N5 (0.37)	-4.33N4 (-3.04)***	-2.94N5 (-1.27)	-4.6N4 (-3.14)***
HUM	0.0234 (4.41)***	0.188 (1.19)	0.162 (1.09)	0.390 (2.61)***	0.112 (4.57)***	0.370 (2.29)**
POPG	6.57N4 (0.06)	0.445 (1.52)	0.521 (1.80)*	0.610 (2.08)**	0.0668 (1.40)	0.473 (1.57)
ENR.P		6.22 (3.16)***				
ENR.H				-0.320 (-4.61)***		
dHUM						-0.291 (-0.67)
Constant	0.826 (22.3)***	-1.40 (-0.726)	-0.526 (-0.50)	3.55 (3.39)***	-0.0893 (-0.52)	3.62 (3.36)***
R^2	0.245	0.151	0.0289	0.189	0.131	0.109
# of obs.	214	214	213	213	216	216
Note: Please refer to the notes to Tables 1 and 2M.						

Table 5Y: Education Enrollment and Human Capital

Estimation	YEP.V	YEP.P	YEH.V	YEH.P	YdH.V	YdH.P
			Dependent Variables			
Indep. Var.	ENR.P	GR	ENR.H	GR	dHUM	GR
YRR	-9.62N4 (-0.90)	-0.0448 (-1.48)	0.0614 (2.07)**	-0.0353 (-1.17)	-0.00258 (-0.53)	-0.0523 (-1.69)*
YRR^2	1.17N5 (0.65)	4.24N4 (0.83)	-7.87N4 (-1.57)	2.96N4 (0.59)	-1.96N5 (-0.24)	5.03N4 (0.97)

[18] A higher growth rate may raise the expected return on education and therefore increases the level of investment in education. The coefficients of the enrolment variables may be positively biased. However, ENR.P and ENR.H have opposite signs on GR and they have the expected signs in all other related regressions. Also, the estimated and calculated effects in the decomposition exercises are close to each other. These results suggest that the potential simultaneity problem is not serious enough to damage our conclusions.

y_0	2.00N7	-4.48N4	6.09N5	-4.27N4	-2.77N5	-4.58N4
	(0.04)	(-3.13)***	(0.43)	(-2.99)***	(-1.20)	(-3.12)***
HUM	0.0238	0.226	0.145	0.422	0.121	0.419
	(4.38)***	(1.40)	(0.95)	(2.76)***	(4.86)***	(2.52)**
POPG	0.00108	0.511	0.508	0.668	0.0817	0.550
	(0.10)	(1.72)*	(1.73)*	(2.25)**	(1.70)*	(1.79)*
ENR.P		6.10				
		(3.10)***				
ENR.H				-0.314		
				(-4.50)***		
dHUM						-0.362
						(-0.83)
Constant	0.825	-1.67	-0.48	3.22	-0.148	3.26
	(22.41)***	(-0.86)	(-0.46)	(3.08)***	(-0.88)	(3.05)***
R^2	0.247	0.155	0.0401	0.193	0.144	0.117
# of obs.	214	214	213	213	216	216

Note: Please refer to the notes to Tables 1 and 2M.

Table 5D: Education Enrollment and Human Capital

Model	Direct effect (a)	Human capital channel (b)	Total effect (c)	c1/c2	b/c2
MEP (ENR.P)	-0.793	-0.0104 x 6.22 = -0.0647	c1= -0.834 c2= (a)+(b) = -0.858	0.97	0.075
YEP (ENR.P)	-0.0448	-9.62N4 x 6.10 = -0.00587	c1= -0.0514 c2= (a)+(b) = -0.0507	1.01	0.12
MEH (ENR.H)	-0.668	0.722 x (-0.320) = -0.231	c1= -0.834 c2= (a)+(b) = -0.899	0.93	0.26
YEH (ENR.H)	-0.0353	0.0614 x (-0.314) = -0.0193	c1= -0.0514 c2= (a)+(b) = -0.0546	0.94	0.35
MdH (dHUM)	-0.850	-0.0559 x (-0.291) = 0.0163	c1= -0.834 c2= (a)+(b) = -0.834	1.00	0.020#
YdH (dHUM)	-0.0523	-0.00258 x (-0.362) = 0.000934	c1= -0.0514 c2= (a)+(b) = -0.0514	1.00	0.018#

Notes: 1. # absolute value of (b/c2).
2. Total effects are based on estimates in MAT and YAT respectively.

Insert Tables 5M, 5Y and 5D about here

The results reported in Tables 5 suggest that MWL reduces the enrolment rate in primary education (ENR.P). People deprived of primary education can be very destructive as it is very difficult to accumulate human capital through self-learning and 'learning from doing' if they cannot read, cannot perform simple calculations and cannot have a job. In contrast, MWL raises the enrolment rate for higher education (ENR.H) but results in a lower growth rate that accounts for more than 26 percent of the total effect. The general effects of the MWL variables on the

change in human capital are negative. Ironically, a reduction in human capital investment has a positive effect on growth when the social benefit of human capital is lower than its social cost. A reason is due to the misallocation of schooling resources induced by MWL: under-investment in primary education and over-investment in higher education as indicated above, in additional to the other adverse effects of MWL on the marginal social benefits of human capital when productivity and employment opportunities are reduced.[19]

4.5 Population Growth Rate

According to the fertility literature, household fertility decisions are based on cost and benefit calculations.[20] MWL is normally found to result in a higher unemployment rate among unskilled laborers (Neumark and Wascher, 2008). The higher unemployment rate raises the relative value of high-quality children who can get a job in comparison with children who cannot get a job. As a result, households reduce the number of children produced while allocating their saved resources to raise the quality of their existing children by extending the duration of their schooling within the limits of their financial capabilities. As a result, the MWL variables have a negative effect on the population growth rate but a positive effect on the enrolment rate in higher education as founded in the previous subsection. The results in Table 6D do indicate that the MWL variables have a negative effect on the population growth rate, and account for more than 7 percent of the total effect.

Table 6MY : Population Growth Rate

Estimation	MPOP.T	MPOP.V	MPOP.P	YPOP.T	YPOP.V	YPOP.P
			Dependent Variables			
Indep. Var.	GR	POPG	GR	GR	POPG	GR
YRR				-0.0570 (-1.85)*	-0.0108 (-1.55)	-0.0514 (-1.67)*
YRR^2				6.52N4 (1.26)	2.74N4 (2.35)**	5.1N4 (0.98)
MWD	-0.897 (-1.93)*	-0.139 (-1.31)	-0.834 (-1.79)*			
y_0	-5.22N4 (-3.77)***	-1.56N4 (-4.92)***	-4.51N4 (-3.09)***	-5.28N4 (-3.81)***	-1.56N4 (-4.98)***	-4.48N4 (-3.07)***
HUM	0.279 (1.86)*	-0.131 (-3.81)***	0.338 (2.19)**	0.300 (1.97)**	-0.146 (-4.26)***	0.375 (2.38)**

[19] As in most resource allocation problems, there is a social optimal level of investment in schooling years, as detailed by Mo (2002), among many others.

[20] See Pritchett (1994), among others, for a review of the relevant theories.

POPG			0.454 (1.52)			0.517 (1.71)*
Constant	5.05 (9.30)***	3.10 (24.93)***	3.65 (3.40)***	4.91 (9.57)***	3.09 (26.63)***	3.31 (3.11)***
R^2	0.0978	0.521	0.108	0.102	0.534	0.114
# of obs.	216	216	216	216	216	216

Notes:

1. Please refer to the notes to Tables 1 and 2M.
2. Based on the estimate in MPOP.T, WR reduce GR by 0.897 percentage points or 22 percent.
3. Based on the estimate in YPOP.T, the first order effect of YRR on GR equals 0.057. The marginal effect of YRR reaches zero with $YRR^* = 43.7$. Evaluated at YRR^*, the reduction in growth rate equals 1.25 percentage points, or 30 percent when evaluated at the mean.

Table 6D: Population Growth Rate

Model	Direct effect (a)	Population Growth (b)	Total effect (c)	c1/c2	b/c2
MPOP	-0.834	-0.139x0.454 = -0.0631	c1= -0.897 c2= (a)+(b) = -0.897	1.00	0.070
YPOP	-0.0514	-0.0108x0.517 = -0.00558	c1= -0.0570 c2= (a)+(b) = -0.0570	1.00	0.098

Note: The total effects reported in c1 are based on the estimates in MAT and YAT respectively.

Insert Table 6MY and 6D about here.

4.6 The Overall Situation

When the transmission variables are correlated with each other, the estimates of the regressions in the previous subsections will be biased. In this section, we estimate the respective effects of the transmission channels on the growth rate by including all transmission variables in the model at the same time and then calculating the overall effect based on the following formula:

$$\frac{dGR}{dMWL} = \frac{\partial GR}{\partial MWL} + \sum_{TV} \left(\frac{\partial GR}{\partial TV}\frac{\partial TV}{\partial MWL}\right) + \left(\frac{\partial GR}{\partial INVP}\frac{\partial INVP}{\partial MWL}\right). \quad (7)$$

where *TV* includes government size, government investment, political instability, the enrolment ratios, change in human capital, and the population growth rate.

In the previous estimations, no regional or year dummies which might be correlated with the MWL variables were introduced. To further assess the robustness of our findings, Table 7D decomposes all the transmission variables simultaneously and compares the decompositions

based on the estimations with and without the control of the regional and year dummies.[21] The decompositions in MAP.D and YAP.D are respectively based on the estimates in MAP and YAP and the related estimates of the effect of the MWL variables on the transmission variables reported in the previous tables. MDUM.D and YDUM.D are decomposed based on the estimations reported in Tables A1.MDUM and A1.YDUM in the Appendix respectively. This decomposition exercise allows us to assess whether our major conclusions remain intact when the regional and year dummies are included in the regressions.

After the dummies are added to control for the possible time dynamics and regional characteristics, the coefficients of the MWL variables become more significant statistically and in magnitude. The dummy variables appear to have captured some regional characteristics that are closely correlated to the MWL variables and the transmission variables. As revealed by the ratios between the estimated effect (e1) and the calculated effect (e2) in MDUM.D and YDUM.D, the totals are not particularly close to each other. This is expected, as the decompositions are based on many regressions with different sample sizes. However, all the variables have the expected signs and the results indicate a high level of consistency among the estimations of all various specifications and decomposition analyses.[22]

Table 7D: The Overall Picture with and without Dummy Variables

Estimation	MAP.D	MDUM.D	YAP.D	YDUM.D
Direct Effect	-0.334 (26%)	-0.637 (50%)	-0.0173 (23%)	-0.0364 (48%)
Investment	-0.0354x17.2 = -0.609 (47%)	-0.0319x12.6 = -0.401 (31%)	-0.00136x17.1 = -0.0232 (31%)	-0.00110x13.0 = -0.0142 (19%)
Population Growth	-0.139x0.541 = -0.0750 (6%)	-0.0964x 0.828 = -0.0798 (6%)	-0.0108x0.575 = -0.00621 (8%)	-0.0120x 0.859 = -0.0103 (14%)
Govt. Size	0.00457x(-8.69) = -0.0397 (3%)	0.00918x(-8.48) = -0.0779 (6%)	2.17N4x(-8.91) = -0.00193 (3%)	5.34N4x(-8.74) = -0.00467 (6%)
Govt. Investment	-0.00261x10.4 = -0.027 (2%)	-0.00558x2.06 = -0.0115 (1%)	-8.31N4x(10.1) = -0.00839 (11%)	-0.00127x1.19 = -0.00151 (2%)

[21] The equations system with the regional and year dummies included for decomposition purposes is reported in Table A1 in the Appendix. Mo (2003) performs a decomposition exercise on land distribution inequality to explain the difference in productivity growth between LAAM and ASIAE. Regional dummies embody a bundle of regional characteristics that may include different institutional characteristics specific to each region. In additional to the possible time dynamics of the dependent variables, one potential concern is that the effects of the MWL variables might be driven by other regional characteristics that are correlated with the MWL variables. The regression results and the associated decomposition exercise suggest that all our major conclusions remain intact after we control the possibilities.

[22] In the estimations for the effects of the MWL variables on INVP in Tables A1.MDUM and A1.YDUM, we include all transmission variables in the regressions for comparison purpose. We find that our conclusions remain intact whether the transmission variables are included or not in the INVP regression.

Political Instability	0.0142x(-2.75) = -0.0390 (3%)	0.00924x(-2.26) = -0.0209 (2%)	6.53N4 x(-2.77) = -0.00181 (2%)	3.15N4x(-2.32) = -7.31N4 (1%)
Higher Education Enrollment	0.644x(-0.299) = -0.193 (15%)	0.195*x(-0.236) =-0.0461 (4%)	0.0554x(-0.297) =-0.0165 (22%)	0.0212x(-0.239) =-0.00506 (7%)
Primary Education Enrollment	-0.0105x2.16 = -0.0226 (2%)	-0.0132x4.85 =-0.0640 (5%)	-9.73N4x2.12 =-0.00206 (3%)	-0.00131x4.81 =-0.00631 (8%)
Change in Human Capital	-0.0652x(-0.547) = 0.0357 (3%)	-0.105x(-0.509) = 0.0534 (4%)	-0.00347x(- 0.570) = 0.00198 (3%)	-0.00692x(-0.537) = 0.00372 (5%)
Total Effect	e1= -1.28 [-1.23] e2= -1.30 e1/e2 = 0.98	e1= -1.02 e2= -1.28 e1/e2 = 0.80	e1 = -0.0743 [-0.069] e2 = -0.0745 e1/e2 = 0.997	e1= -0.0643 e2= -0.0755 e1/e2 = 0.85

Notes:

1. e1 in MAP.D and YAP.D is based on the estimations with 209 observations under the same specifications as in MPOP.T and YPOP.T respectively while the numbers inside […] are of the 216 observations reported for comparison.
2. Based on the estimate reported in Table A1.MDUM, the total effect of MWL on GR equals 1.02 percentage points or 25 percent when evaluated at the mean.
3. Based on the estimate reported in Table A1.YDUM, the first order total effect of YRR on GR equals 0.0643 while the second order effect of 8.55N4. The marginal effect of YRR reaches zero with YRR^{*} = 37.6. Evaluated at YRR^{*}, the reduction in growth rate equals 1.21 percentage points, or 29.6 percent when evaluated at the mean.

Insert Table 7D about here

In general, the estimates under the various specifications suggest that countries with MWL typically have a growth rate about 20 to 30 percent lower than the sample mean over the period studied. At the 'steady state' where the marginal effect of YRR equals zero, a country will have a growth rate about 30 to 38 percent lower than the average.[23] In the decompositions reported in Table 7D, the direct impact of the MWL variables accounts for more than 23 percent of the total effect. This suggests that through its effects on the incentive structure facing all economic agents, MWL has pervasive, significant, and complicated effects on the behavior of the diverse range of economic agents. These effects on the ultimate economic outcomes such as GDP growth and investment are still substantial after the various transmission variables are taken into consideration.

5. Do Our Main Conclusions Remain Valid in the 'decades of turbulence'?

Over the past two decades, revolutions in information technology (IT) have resulted in much greater globalization and an increasing digital divide on both national and international level.

[23] We disregard the increasing effect of YRR on GR beyond YRR^{*}. The positive effect is theoretically unlikely. Moreover, YRR^{*} ranges from about 38 years to 50 years in the estimations while the average YRR is only about 17 years in the sample.

These trends have spawned a transitional period marked by frequent bouts of economic turbulence. The global adjustment process generated by technological shocks has been reflected by the widespread financial crises experienced in recent decades and by surges in productivity and GDP growth in countries and sectors that have been able to be benefitted from the IT revolution. The unstable socio-economic environment generated by domestic and international digital divides has resulted in national economic data that may not reveal long-run equilibrium conditions.[24] To minimize the possible effect of the shocks caused by region-specific disturbances such as the Latin American and Asian financial crises on our estimations as well as the stage of institutional development divergences among different regions, we separate countries into regions before conducting our analysis. We also introduce the GDP and trade-GDP ratio (TRADE) variables into our regressions as in ASM3 and OEY3 to capture the potential effects of the IT revolution and globalization on the growth performance.[25] The estimations are based on panel data sets of 5 years in the period 1985-2004. We do not attempt to repeat all the exercises performed in Section 4 due to data limitations and the transitional properties in this period. We find that only the estimations for the ASIAE and OECD countries, which are known to have more stable and mature economic and socio-political institutions, generate the expected results, while the estimations based on LAAM and SAFRI countries are not stable.[26] The regression results reported in Tables 9AS and 9OE, though not as comprehensive as those given in Section 4, indicate that our basic conclusions based on the detailed analyses in the previous sections are likely to remain intact even in this turbulent period if the institutional quality of different regions and countries are properly controlled. The coefficients of the MWL variables have the expected signs in all estimations. However, they are statistically more significant in the ASIAE countries than their OECD counterparts. A possible reason is that the OECD sample has much higher average YRR than its counterpart as indicated in Tables A3AS and A3OECD.[27] Another reason is that the OECD countries have inherited similar institutional traditions such that the deviations in their MWL variables might have over-represented their divergences in related regulations.

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[24] Please refer to Mo (2008) and Norris (2001) for the related literature and discussions, among many others.

[25] Advances in IT have substantially reduced domestic and international transaction costs, which has been of particular benefit to large economies and/or those that rely heavily on international trade.

[26] The estimation results based on the LAAM and SAFRI countries are unstable and the sign is sometimes not as expected. This may be due to the unstable international and domestic environment generated by the technological shock in the period that results in more unstable and pronounced influences to these countries with less matured economic and socio-political institutions.

[27] The related data source, simple statistics and list of the countries involved in the regressions are reported in Appendix Tables A3.

Table 8AS: ASIAE Countries

Estimation	MAS1	MAS2	MAS3	YAS1	YAS2	YAS3
			Dependent Variables			
Indept. Var.	GR	GR	GR	GR	GR	GR
YRR				-0.277	-0.228	-0.252
				(-2.53)**	(-2.03)*	(-1.56)
YRR^2				0.00483	0.00452	0.00418
				(2.13)**	(2.06)**	(1.30)
MWD	-4.43	-4.31	-2.06			
	(-2.47)**	(-1.95)*	(-1.01)			
POPG	0.00667	0.178	0.0407		-0.240	0.0978
	(0.008)	(0.17)	(0.05)		(-0.39)	(0.14)
INVP			0.0673			0.121
			(0.74)			(1.07)
y_0	-2.12N4	-1.73N5	-4.75N5		4.15N5	-1.97N4
	(-1.59)	(-0.06)	(-0.20)		(0.33)	(-1.54)
GSIZE	-0.104	-0.147	-0.0572			
	(-1.23)	(-1.39)	(-0.60)			
TRADE		-0.0126	0.00288			
		(-0.75)	(0.19)			
GDP		-4.97N12	2.39N12			
		(-0.91)	(0.44)			
YR			-1.82		-1.83	
			(-2.93)***		(-3.51)***	
Constant	14.0	15.6	12.2	9.78	13.8	7.31
	(5.07)***	(4.75)***	(2.97)***	(9.70)***	(7.18)***	(1.71)*
R^2	0.236	0.261	0.488	0.183	0.464	0.265
# of obs.	35	35	35	35	35	35

Notes:

1. Please refer to the notes to Tables 1 and 2M. In addition, TRADE = (import + export)/GDP; GDP = real GDP. YR = dummy for time periods: 1=1985-1989, and so on.
2. Based on the estimate in YAS2, the first order effect of YRR on GR equals 0.228. The marginal effect of YRR reaches zero with $YRR^* = 25$. Evaluated at YRR^*, the reduction in growth rate equals 2.85 percentage points or 38 percent evaluated at the mean of 7.58 reported in Table A3 in the Appendix.

Table 8OE: OECD Countries

Estimation	MOE1	MOE2	MOE3	YOE1	YOE2	YOE3
			Dependent Variables			
Indept. Var.	GR	GR	GR	GR	GR	GR
YRR				-0.0173	-0.0143	-0.0338
				(-1.05)	(-0.88)	(-2.14)**
YRR^2				1.67N4	1.4N4	4.6N4
				(0.86)	(0.73)	(2.51)**
MWD	-0.233	-0.365	-0.488			
	(-0.63)	(-1.03)	(-1.41)			
POPG	1.06	0.752	0.790	1.06	1.10	0.544

	(3.05)***	(2.23)**	(2.39)**	(2.98)***	(3.13)***	(1.60)
INVP		-0.0182				-0.0187
		(-0.31)				(-0.33)
y_0	-6.73N5	-1.06N4	-1.49N4	-6.68N5	-2.92N5	-1.25N4
	(-3.06)***	(-2.94)***	(-5.58)***	(-3.00)***	(-1.00)	(-3.53)***
GSIZE		-0.0610	-0.0334			-0.0692
		(-1.16)	(-0.79)			(-1.36)
TRADE		0.0207	0.0225			0.0239
		(4.36)***	(5.12)***			(4.97)***
GDP		2.38N13	2.97N13			2.97N13
		(1.67)*	(2.29)**			(2.11)**
YR		-0.326			-0.377	-0.316
		(-1.80)*			(-1.94)*	(-1.80)*
Constant	6.12	7.80	6.80	6.19	6.31	8.15
	(10.58)***	(3.71)***	(6.92)***	(11.10)***	(11.40)***	(3.98)***
R^2	0.159	0.385	0.361	0.166	0.200	0.422
# of obs.	96	96	96	96	96	96

Notes:

1. Please refer to the notes to Tables 1, 2M and 8AS.
2. Based on the estimate in YOE3, the first order effect of YRR on GR equals 0.0338. The marginal effect of YRR reaches zero with $YRR^* = 36.7$. Evaluated at YRR^*, the reduction in growth rate equals 0.62, or 12 percent, evaluated at the mean of 5.32 reported in Table A2 in the Appendix.

The estimations of MOE3 and YOE3 indicate that after TRADE and GDP are included in the model, the significance of the MWL variables increases substantially.[28]

6. Conclusion

It is the incentive structure imbedded in the institutional/organizational structure of economies that has to be the key to unraveling the puzzle of uneven and erratic growth. -- Douglas C. North

Our estimates made under various specifications suggest that countries with MWL typically have a growth rate of about 20 to 30 percent lower than the mean in our sample periods. The effect of MWL on GDP growth rate is small in initial years with the first order effect of typically less than 0.1 percentage point. However, at the 'steady state' where the marginal effect of the legislation years equals zero, a country will have a growth rate about 30 to 38 percent lower than the sample mean. The results suggest that the longer the MWL have been in place, the more destructive they are to an economy. In this study, we use a methodology that has generated a long

[28] This phenomenon is not observed in its ASIAE counterparts. The IT revolution and its impacts appear to have particularly beneficial to 'mature economies' like those of the OECD that have the ready institutions, technology and capital to tap the benefits from the technological breakthrough.

series of consistent results in other studies to investigate the effects of MWL on economic performances. The conclusions are based on a substantial body of empirical evidences of remarkable consistency. Refuting them requires a more persuasive system of models be formulated and different results are generated with a similar or improved data set. An alternative way of doing so is to employ the same estimation system, use another well-accepted data set, and generate opposite results with a comparable level of consistency. These efforts would allow comparison between investigations and the truth of the matter will finally emerge when sufficient research has accumulated.

Our contribution to the literature is twofold. The first and obvious contribution of our finding is that MWL has a detrimental effect on economic performance. Given that MWL is extensively adopted across countries and also generally approved by international organizations, our findings will have very important policy implications. At a higher level, we give an example to illustrate how a bad institution, the rules of the game governing economic interactions, ultimately determines economic performances, and the rise or decline of economies over time.

Let us go back to an important question raised in the classic article by Stigler (1946): is there any better alternative to MWL for reducing poverty? Based on our current knowledge, the answer is definitely 'yes.' Most countries are likely to experience a decline in the share of national income that goes to wages. (Global Wage Report 2008/09). However, this does not imply that we have to impose MWL. Governments should think about using a wider set of tools including the creation of a more equal opportunity environment by supplying productive public infrastructures, reducing unproductive taxes while capturing unearned land-rent to support public services, and reducing rent-seeking activities such as corruption, unproductive transfers and subsidies. These initiatives would have far greater benefits for the wellbeing of the poor and society as a whole than MWL.[29] Far from eradicating poverty among the lowly paid, MWL prolong and even exacerbate it. There is little argument that productivity and economic growth foster the productive use of labor, the main asset of the poor, and can lead to a rapid reduction in the incidence of poverty (see, among many others, Squire, 1993 and Dollar and Kraay, 2002) It is simply not realistic to expect significant sustained wage growth to the protected poor when productivity and GDP growth rates are retarded by MWL.

[29] For instance, Mo (1996, 2001, 2003, 2007, 2009).

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Appendixes:

Table A1.MDUM: Estimations with Year and Regional Dummy

Indep. Var.	GR	INVP	POPG	GSIZE	GINV	PINSTAB	dHUM	ENR.P	ENR.H	GR
MWD	-1.02	-0.0319	-0.0964	0.00918	-0.00558	0.00924	-0.105	-0.0132	0.195	-0.637
	(-2.29)**	(-4.21)***	(-0.89)	(1.08)	(-0.87)	(0.35)	(-1.34)	(-0.80)	(0.56)	(-1.49)
y_0	-4.90N4	3.01N6	-5.47N5	-8.89N6	2.88N6	-2.10N5	-4.79N5	-2.08N6	9.42N5	-5.20N4
	(-3.02)***	(1.04)	(-1.39)	(-2.87)***	(1.24)	(-2.20)**	(-1.68)*	(-0.34)	(0.74)	(-3.31)***
HUM	0.211	-1.54N4	-0.131	0.0105	-0.00590	-9.02N4	0.103	0.0220	0.0185	0.215
	(1.54)	(-0.05)	(-3.95)***	(4.01)***	(-3.01)***	(-0.11)	(4.26)***	(4.32)***	(0.17)	(1.40)
POPG		3.47N4								0.828
		(0.07)								(3.11)***
INVP										12.6
										(3.17)
GSIZE		0.0208								-8.48
		(0.32)								(-2.41)
GINV		-0.188								2.06
		(-1.98)**								(0.40)
PINSTAB		-0.0313								-2.26
		(-1.51)								(-2.00)**
dHUM		0.00217								-0.509
		(0.33)								(-1.44)
ENR.P		0.106								4.85
		(3.00)***								(2.46)**
ENR.H		-3.77N4								-0.236
		(-0.25)								(-2.86)***
YR	-1.06	-0.00654	0.0289	0.00968	0.00716	0.0124	0.0705	0.00731	2.55	-0.307
	(-4.15)***	(-1.08)	(0.47)	(1.98)**	(1.95)*	(0.82)	(1.56)	(0.76)	(12.82)***	(-0.94)
ASIAE	0.487	0.0401	-0.0504	-0.0231	-0.0226	0.0119	-0.156	0.0563	0.260	-0.435
	(0.60)	(2.90)***	(-0.26)	(-1.50)	(-2.00)**	(0.25)	(-1.10)	(1.88)*	(0.42)	(-0.57)
LAAM	-2.53	-0.00910	0.118	-0.0336	-0.0396	0.0601	-0.0957	0.0690	0.678	-2.91
	(-3.82)***	(-0.75)	(0.74)	(-2.66)***	(-4.25)***	(1.56)	(-0.82)	(2.80)***	(1.34)	(-4.41)***
OECD	-0.950	0.0149	-0.722	-0.0278	-0.0498	0.0484	-0.0635	0.0537	-1.09	-1.24
	(-1.07)	(0.94)	(-3.36)***	(-1.64)	(-4.01)***	(0.94)	(-0.41)	(1.63)	(-1.59)	(-1.45)
SAFRICA	-2.86	-0.00256	0.199	0.0311	-0.0281	0.00149	-0.171	-0.00804	-0.593	-2.34
	(-3.31)***	(-0.17)	(0.95)	(1.89)*	(-2.26)	(0.03)	(-1.13)	(-0.25)	(-0.89)	(-2.86)***
Constant	8.80	0.0930	2.82	0.142	0.117	0.111	0.122	0.785	-3.61	1.62
	(10.27)***	(2.66)***	(13.57)***	(8.69)***	(9.57)***	(2.21)**	(0.81)	(24.62)***	(-5.46)***	(0.84)
R^2	0.281	0.373	0.571	0.194	0.225	0.104	0.139	0.290	0.499	0.470
# of obs.	216	203	216	216	209	214	216	214	213	203

Note: Please refer to the notes to Tables 1 and 2M.

Table A1.YDUM: Estimations with Year and Regional Dummy

Indep. Var.	GR	INVP	POPG	GSIZE	GINV	PINSTAB	dHUM	ENR.P	ENR.H	GR
YRE	-0.0643	-0.00110	-0.0120	5.34N4	-0.00127	3.15N4	-0.00692	-0.00131	0.0212	-0.0364
	(-2.14)**	(-2.12)**	(-1.68)*	(0.93)	(-3.04)***	(0.18)	(-1.32)	(-1.18)	(0.92)	(-1.30)
YRE^2	8.55N4	7.42N6	2.8N4	-1.10N5	1.92N5	-3.18N6	4.13N5	1.58N5	-3.17N4	4.15N4
	(1.76)*	(0.89)	(2.43)**	(-1.18)	(2.86)***	(-0.11)	(0.49)	(0.88)	(-0.85)	(0.93)
y_0	-4.66N4	3.71N6	-5.21N5	-9.19N6	2.80N6	-2.13N5	-4.65N5	-1.94N6	9.23N5	-5.09N4
	(-2.87)***	(1.27)	(-1.35)	(-2.98)***	(1.24)	(-2.24)**	(-1.64)	(-0.32)	(0.73)	(-3.24)***
HUM	0.218	0.00155	-0.145	0.0110	-0.00589	-9.85N4	0.111	0.0225	0.0186	0.233
	(1.56)	(0.52)	(-4.36)***	(4.12)***	(-3.01)***	(-0.12)	(4.54)***	(4.35)***	(0.17)	(1.46)
POPG		0.00305								0.86
		(0.60)								(3.16)***
INVP										13.0
										(3.31)***
GSIZE		-0.00499								-8.74
		(-0.075)								(-2.46)**
GINV		-0.212								1.19
		(-2.15)**								(0.22)
PINSTAB		-0.0349								-2.32
		(-1.66)*								(-2.05)**
dHUM		5.79N4								-0.537
		(0.09)								(-1.50)
ENR.P		0.104								4.81
		(2.89)***								(2.44)**
ENR.H		-6.43N4								-0.239
		(-0.41)								(-2.87)***
YR	-1.07	-0.00582	0.0207	0.0102	0.00769	0.0126	0.0754	0.0078	2.54	-0.290
	(-4.16)***	(-0.94)	(0.34)	(2.08)**	(2.14)**	(0.84)	(1.68)*	(0.81)	(12.8)***	(-0.88)
ASIAE	0.383	0.0377	-0.0214	-0.0251	-0.0283	0.0115	-0.203	0.0503	0.322	-0.567
	(0.46)	(2.61)***	(-0.11)	(-1.60)	(-2.50)**	(0.24)	(-1.41)	(1.65)	(0.51)	(-0.72)
LAAM	-2.54	-0.00959	0.112	-0.0341	-0.0418	0.0595	-0.103	0.0671	0.702	-2.96
	(-3.82)***	(-0.77)	(0.71)	(-2.69)***	(-4.57)***	(1.54)	(-0.89)	(2.72)***	(1.38)	(-4.44)***
OECD	-1.23	0.00782	-0.739	-0.0268	-0.0552	0.0499	-0.111	0.0471	-1.01	-1.46
	(-1.36)	(0.48)	(-3.44)***	(-1.56)	(-4.46)***	(0.95)	(-0.70)	(1.40)	(-1.45)	(-1.67)*
SAFRICA	-2.95	-0.00287	0.203	0.0290	-0.0371	1.92N4	-0.217	-0.0155	-0.498	-2.47
	(-3.34)***	(-0.18)	(0.97)	(1.72)*	(-2.97)***	(0.004)	(-1.41)	(-0.47)	(-0.74)	(-2.91)***
Constant	8.65	0.0803	2.85	0.144	0.125	0.115	0.115	0.788	-3.66	1.54
	(10.30)***	(2.25)**	(14.25)***	(9.02)***	(10.70)***	(2.33)**	(0.79)	(2.53)***	(-5.66)***	(0.79)
R^2	0.280	0.357	0.586	0.195	0.257	0.104	0.154	0.294	0.501	0.470
# of obs.	216	203	216	216	209	214	216	214	213	203

Table A2: Data Sources, Regressions 1970-1985

Variables involved	Original Source
Real GDP per capita	Summers and Heston (1988), GDPSH4
Total population	Same, POP
Ratio of real government "consumption" expenditure to real GDP	Same, GOVSH4
Ratio of real domestic investment (private plus public) to real GDP	Same (1988), INVSH4
Ratio of nominal public domestic investment to nominal GDP	Same, INVPUB
Average schooling years in the total population over age 25 in 1970, 1985 (proxy for human capital stock)	Barro and Lee, HUMAN
Measure of political instability	Same, PINSTAB
Dummy for East Asian , Latin-American, OECD, Sub-Saharan African Countries	Same, ASIAE, LAAM, OECD, SAFRICA
Total gross enrollment ratio for primary education	UNESCO, H
Total gross enrollment ratio for higher education	UNESCO, H

Table A3: Data Source, Regressions 1985-2004

Variables involved	Source
GDP per capita (PPPs)	World Bank
Total population	International Financial Statistics
GDP by Type of Expenditure - National currency	United Nations
Real Government "Consumption" Expenditure – National Currency	Same
Real Gross Investment Expenditure – National Currency	Same
Total Export – National Currency	Same
Total Import – National Currency	Same

Table A3AS : Correlations and Descriptive Statistics, ASIAE

	GR	YRR	MWD	POPG	INVP	GSIZE	TRADE	y_0	YR
GR	1								
YRR	-0.26	1							
MWD	-0.38	0.52	1						
POPG	-0.01	0.22	-0.05	1					
INVP	0.39	-0.26	-0.49	-0.13	1				
GSIZE	-0.25	0.21	0.25	0.48	-0.44	1			
TRADE	0.07	-0.09	-0.66	0.28	0.34	0.01	1		
y_0	-0.09	-0.22	0.20	-0.60	0.18	-0.62	-0.34	1	
YR	-0.57	0.22	0.12	-0.16	-0.11	-0.09	0.19	0.41	1
Mean	7.58	18.46	0.83	1.89	27.29	14.98	130.91	1.76E11	2.46
(S.D.)	3.54	16.38	0.38	0.82	7.24	7.99	91.26	2.00E11	1.12

Notes:
1. The statistics are based on the panel data set of 5 years in the period 1985-2004.
2. The above correlation coefficients are based on 35 observations

Table A3OECD : Correlations and Descriptive Statistics, OECD

	GR	YRR	MWD	POPG	INVP	GSIZE	TRADE	y_0	YR
GR	1								
YRR	-0.03	1							
MWD	0.01	0.71	1						
POPG	0.27	0.24	0.13	1					
INVP	-0.13	0.08	0.09	0.01	1				
GSIZE	-0.21	-0.10	-0.13	-0.37	-0.46	1			
TRADE	0.23	-0.19	-0.06	0.10	-0.10	0.03	1		
y_0	-0.11	0.34	0.27	0.06	-0.04	-0.19	-0.34	1	
YR	-0.31	0.14	0.03	0.09	0.22	-0.12	0.29	0.14	1
Mean	5.32	31.75	0.72	0.66	22.76	18.54	75.73	7.53E11	2.50
(S.D.)	1.71	28.15	0.45	0.48	3.13	3.81	46.30	1.50E12	1.12

Notes:
1. The statistics are based on the panel data set of 5 years in the period 1985-2004.
2. The above correlation coefficients are based on 96 observations.

Table A3LIST: List of the ASIAE and OECD Countries, Regressions 1985-2004

ASIAE Countries					
Fiji	Indonesia	Korea	Malaysia	Philippines	Singapore
Solomon Islands	Thailand	Papua New Guinea			
OECD Countries					
Australia	Austria	Belgium	Canada	Denmark	Finland
France	Germany, West	Greece	Iceland	Ireland	Italy
Japan	Luxembourg	Netherlands	New Zealand	Norway	Portugal
Spain	Sweden	Sweitzerland	Turkey	United Kingdom	United States

Table A4: Data Set for the MWL Variables Used in Regressions 1975-1985

<can be left out in publication version>

Country name	ILO Earliest Recorded Legislation on Wage-Labor Market	Modified date of MWL Introduced
Algeria	27-Jun-1981: Law No. 81-07 concerning apprenticeships	1978: Reference (1)
Angola	1-Feb-2000: General Labour Law (Lei Geral do Trabalho), Act No. 2/2000	
Benin	n.a.	
Botswana	1-Aug-1980: Regulation of wages Order	
Burkina Faso	15-Jan-1997: Decree No. 97-007/PRES/PM/MEF/MFPMA	
Burundi	n.a.	
Cameroon	n.a.	
Cape verde	n.a.	
Central African Rep.	n.a.	
Chad	19-Oct-1994: Decree No. 273/PR/MFPT/94	
Comoros	n.a.	
Congo	n.a.	
Egypt	n.a.	
Ethiopia	n.a.	
Gabon	21-Nov-1994: Labour Code, Act No. 3/94	
Gambia	n.a.	
Ghana	1969: Labour Regulations, 1969 (LI 632) (No. 632 of 1969) Official Gazette	
Guinea	n.a.	
Guinea-Bissau	4-Apr-1988: Decree 17/88	
Cote d'Ivoire	n.a.	
Kenya	n.a.	
Lesotho	1992: Labour Code Order 1992	
Liberia	n.a.	
Madagascar	2-Jan-1990: Law No. 89-027 concerning free trade zones in Madagascar	
Malawi	n.a.	
Mali	n.a.	
Mauritania	n.a.	
Mauritius	7-Feb-1974: Industrial Relations Act 1974	
Morocco	1-May-2000: Bulletin officiel, No. 4800 of 1 May 2000	
Mozambique	9-Mar-1994: Decree No. 7/94	
Niger	n.a.	
Nigeria	29-May-1974: Labour Act, (Chapter 198), Decree No. 21 of 1974	
Rwanda	n.a.	
Senegal	19-Feb-1996: Decree No. 96-154 of 19 February 1996	
Seychelles	n.a.	
Sierra Leone	n.a.	
Somalia	n.a.	
South Africa	n.a.	No MW: Ref. (2)
Sudan	n.a.	
Swaziland	n.a.	
Tanzania	n.a.	
Togo	n.a.	
Tunisia	30-Apr-1966: Labour Code	
Ugenda	n.a.	
Zaire	n.a.	
Zambia	n.a.	
Zimbabwe	n.a.	No MW: Ref. (2)
Bahamas, The	2001: Minimum Wages Act, 2001	
Barbados	1-Jul-1961: Domestic Employees Chap. 344	
Canada	1985 : Canada Labour Code R.S. 1985	1918: Ref. (5) & (6)
Costa Rica	27-Aug-1943: Labour Code Law N. 2	1943: Ref. (7)
Dominica	28-Mar-1977: Labour Standards Act, 1977, Chap. 89:05	
Dominican Rep.	29-May-1992: Labour Code, Law 1692	
El Salvador	23-Jun-1972: Labour Code, Decree 15	
Grenada	1999: Employment Act	
Guatemala	1995: Labour Code	
Haiti	12-Sep-1961: Labour Code of 12 September 1961	

Honduras	5-Jul-1959: Labour Code, Decree 189-59	
Jamaica	1954: Minimum Wage Act (Chap. 252) Law 58 of 1954	
Mexico	17-Jan-2006: Federal Labour Law	1917: Ref. (5)
Nicaragua	24-May-1991: Law on Minimum Wage, Law 129	
Panama	1995: Labour Code	
St. Lucia	n.a.	
St. Vincent & Grens.	n.a.	
Trinidad & Tobago	1976: Minimum Wages Act 1976, Act No. 35 of 1976, Chap. 88:04	
United States	1935: National Labor Relations Act of 1935	1938: Ref. (5) & (6)
Argentina	12-Nov-1941: Law on Home Workers No. 12.713	1946: Ref. (7)
Bolivia	8-Dec-1942: General Labour Act	
Brazil	1-May-1940: Legislative Decree No. 2162 of 1 May 1940	
Chile	1958: Law 12.927, Concerning State Security	
Colombia	07-Jul-1951: Substantive Labour Code	
Ecuador	29-Sep-1997: Labour Code, Official Registry No. 162	
Guyana	n.a.	
Paraguay	29-Oct-1993: Law No. 213 enacting the Labour Code	
Peru	26-Jun-1992 Decree Law 25593	1916: Ref. (7)
Suriname	n.a.	
Uruguay	04-Aug-1937: Law No. 9.675	1943: Ref. (7)
Venezuela	19-Jun-1997: Organic Labour Law	
Afghanistan	n.a.	
Baharin	n.a.	
Bangladesh	23-May-1936: Payment of Wages Act, 1936 (Act IV of 1936)	
Myanmar (Burma)	n.a.	
China	05-Jul-1994: Labour Act of the Peoples' Republic of China	
Hong Kong	n.a.	No MW: Ref. (3)
India	1947: Industrial Disputes Act	
Indonesia	1981: Government Regulation No. 8 of 1981 on the Protection of Wages	
Iran, I.R. of	n.a.	
Iraq	n.a.	
Israel	1953: Apprenticeship Law, 5713-1953 Labour Laws	
Japan	n.a.	1959: Ref. (5) & (6)
Jordan	n.a.	
Korea	31-Dec-1986: Minimum Wage Act, Act No. 3927	1988: Ref. (5) & (6)
Kuwait	n.a.	
Malaysia	1947: Wages Council Act, 1947, Act 195	
Nepal	n.a.	
Oman	n.a.	
Pakistan	28-Sep-1961: Minimum Wages Ordinance, 1961	
Philippines	1974: Labour Code of the Philippines Presidential Decree No. 442	
Saudi Arabia	2006: Labour Law (Royal Decree No. M/51)	
Singapore	2004: Industrial Relations Act, CAP 136	No MW: Ref. (8)
Sri Lanka	n.a.	1927: Ref. (3)
Syria	1958: Organization of Agricultural Relations Act, No. 134 of 1958	
Taiwan	n.a.	1984: Ref. (8)
Thailand	12-Feb-1998: Labour Protection Act B.E. 2541	
United Arab Emirates	n.a.	
Yemen, N.Arab	n.a.	
Austria	1974: Collective Labour Relations Act (Arbeitsverfassungsgesetz, ArbVG) Federal Official Gazette No. 22/1974	No MW: Ref. (6)
Belgium	29-May-1952: Act establishing the National Labour Council	1975: Ref. (5) & (6)
Cyprus	1941: Minimum Wage Act (Cap. 183)	
Denmark	n.a.	1977: Ref. (4)
Finland	1946: Collective Agreements Act 436/1946	No MW: Ref. (6)
France	1973: Labour Code	1950: Ref. (5) & (6)
Germany, West	1949: Basic Law of the Federal Republic of Germany	1947: Ref. (4)
Greece	22-Mar-1989: Act No. 1837 concerning the protection of young persons in employment and other provisions	1953: Ref. (5) & (6)
Hungary	04-May-1992: abour Code Act No. 22 of 1992 Magyar Kozlony,	1977: Ref. (5) & (6)
Iceland	1938: Act No. 80 of 1938 on trade unions and industrial disputes	No MW: Ref. (6)
Ireland	31-Mar-2000: National Minimum Wage Act, 2000, Act No. 5 of 2000	2000: Ref. (6)
Italy	1865: Civil Code	1954: Ref. (4)

Luxembourg	23-Dec-1973: Act of 23 December 1973, concerning the reform of the minimum wage	1944: Ref. (5) & (6)
Malta	1989: Wage Increase National Standard Order, Notice No. 169 of 1989	
Netherlands	24-Dec-1927: Act of 24 December 1927 to issue detailed regulations respecting collective agreements	1968: Ref. (5) & (6)
Norway	05-May-1927: Labour Disputes Act No.1	No MW: Ref. (6)
Poland	n.a.	1990: Ref. (5) & (6)
Portugal	02-Apr-1976: Constitution of Portugal	1974: Ref. (5) & (6)
Spain	29-Dec-1978: National Constitution	1963: Ref. (5) & (6)
Sweden	1976: Act on co-determination at work	No MW: Ref. (6)
Switzerland	30-Mar-1911: Code of Obligations of 30 March 1911	No MW: Ref. (6)
Turkey	07-Nov-1982: Constitution of the Republic of Turkey of 7 November 1982, Law No. 2709	1971: Ref. (5) & (6)
United Kingdom	13-Jul-1948: Agricultural Wages Act, 1948	
Yugoslavia	n.a.	
Australia	1988: Workplace Relations Act 1996, Act No. 86	1901: Ref. (6)
Fiji	1957: Wages Councils Act No. 9 of 1957	
New Zealand	1983: Minimum Wage Act, 1983, No.115/1983	1945: Ref. (5) & (6)
Papua New Guinea	1962: Industrial Relations Act 1962, Chapter 174	
Solomon Islands	1981: The Labour Act (Chapter 73) Official Gazette	
Tonga	n.a.	
Vanuatu	n.a.	
Western Samoa	n.a.	

Notes:

1. All data in the second column are based on the International Labour Organization (ILO) Minimum Wage Database. At: www.ilo.org/travaildatabase/ (access date: July, 2009).
2. Data in the third column show the modified items and the source(s) of the information that are listed in the references to Table A5.

References to Table A5

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