Effect on employment

Minimum wage and employment

Minimum wage and the informal economy

The time series data on the informal economy in Latin America provided by the ILO (Regional Office, Lima) were used to analyse the relationship between the growth of the informal economy and changes in the minimum wage. The main variables of interest are summarized in Table 1, which gives the share of urban informal employment in total employment and the ratio of the minimum to the average wage. Informal sector employment included all own-account workers – excepted professionals – and all workers in establishments with less than 5 or 10 persons engaged.

In what follows, we try to measure the role of the minimum wage on changes in the size of the informal sector. A very simple reduced-form equation is tested. On the labour supply side, change in GDP/capita should measure the income incentive associated with the supply of labour in the informal economy while on the labour demand side, log change in the ratio of the minimum wage to the average wage represents changes in the flexibility of the labour market for unskilled labour with respect to more skilled labour.[4] Our independent variable is the annual change in the log of the share of the informal economy. The results of this regression, which are summarized in Table 2, suggest that increases in GDP/capita tend to reduce urban informal employment significantly.

In contrast, changes in the ratio of the minimum to the average wage seem to exert no significant impact on the share of the informal economy. Using changes in real minimum wages in place of changes in the ratio does not improve the significance of the coefficient. This result tends to support the view that labour market rigidity and more specifically wage rigidity introduced by minimum wage regulation is not the main responsibility of the informality of Latin American economies.

Table 2: OLS regression of the share of the informal sector on the minimum wage

Variables	Specification 1	Specification 2	Specification 3
DGDPCAP	.301**(.124)	.314**(.139)	.311 ** (.131)
OVER (MW/AW)	-	-.027 (.018)	-.051 (.107)
DLNWAGE	-	-	-.026 (.112)
R2	.171	.199	.202
Observations	55	21	21

The independent variable is the log change in the share of the informal employment in total employment. Robust standard errors are in parenthesis (White estimator). ** indicates the coefficient is significant at the 5 per cent level.

[4] GDP/capita is also a demand-side variable.

Minimum wage and overall employment

As an attempt to relate changes in the minimum wage to changes in employment, the following equation was estimated using our data:

$$DLNEMPO = \bullet_0 + \bullet_1 GDP + \bullet_2 AFRICA + \bullet_3 ASIA + \bullet_4 LATIN + \bullet_5 DLNREALW + \bullet_6 DLNOVER + \bullet_7 DTRADE + \bullet_8 DLNEDUC + \varepsilon$$

where *DLNEMPO* is the log annual change in the ratio of employment to the population. The vector of regressors contains dummies controlling for location: *AFRICA, NORTHAF, ASIA, LATIN* and the base *TURKEY*, unless otherwise noted. *GDP* is the rate of growth of GDP while *DLNREALW, DLNOVER* and *DLNEDUC* are respectively the log annual change in real average wage in manufacturing, the ratio of the minimum wage to the average wage and the percentage of GDP spent on education. Finally, *DTRADE* represents change in terms of trade from one year to another.

The results, which are displayed in Table 3, show that GDP growth is positively correlated with the increase of employment whatever other factors are controlled. The effect of other variables is much more unstable, for example that of the increase in the real wage rate. From the third regression in Table 3, it would seem that the increase of the real average wage in manufacturing plays a significant and negative role on the level of employment. This effect of the real wage becomes however insignificant once the ratio of the minimum wage to the average wage and the educative variables are introduced as explanatory variables. In all cases, we are unable to identify a significant effect of changes in the ratio of the minimum wage to average wage that would explain variations in employment. Restricting the analysis to manufacturing employment or excluding specific geographic areas like Africa leads to the same conclusion.

Table 3: OLS regression of employment on the minimum wage

Variables	Specification 1	Specification 2	Specification 3
DGDPCAP	.004**(.001)	.005**(.002)	.005* (.003)
AFRICA	-.074** (.032)	.078**(.038)	.069 (.052)
ASIE	-.082** (.034)	.026 (.040)	.015 (.054)
NORTHAF	.007 (.027)	-	-
LATIN	-.068 **(.031)	.027(.038)	.036 (.056)
DLNOVER	-	-.051 (-107)	.003 (.179)
DLNWAGE	-	-.156 (.104)	-.026 (.112)
DTRADE	-	-	.000 (.000)
DLNEDUC	-	-	-.036 (.108)
R2	.071	.141	.05
Observations	218	60	48

The independent variable is the log change in employment. Robust standard errors are in parenthesis (White estimator). ** indicates the coefficient is significant at the 5 per cent level and * at the 10 per cent level.

The extent of non-compliance practises in developing countries (see section 3) is expected to reduce the employment effects of minimum wages and may explain part of our results. There is another simple explanation for the low often found disemployment effect caused by minimum wages. The decrease in the real minimum wage during most of the 1980s in many countries might be responsible for the small employment effect as a low value of the minimum wage is unlikely to cause much unemployment. There is a simple way of checking for such an effect: if the minimum wage has a negative impact on employment, we would expect this negative impact to be stronger in countries with a relatively high level of minimum wage. This kind of cross-section analysis leads to no significant result on our data set.

Effect on poverty

Poverty line

Table 4 describes our data on the minimum wage and poverty by giving the minimum wage in dollars in the mid 1990s and the ratio of the minimum wage to the poverty lines at US$1 and US$2 a day for 31 countries. The data are presented by region. North-African countries have a relatively high minimum wage with more than US$100 a month while the minimum wage in all Sub-Saharan African countries except Senegal are under US$50 a month. The figure for most Latin-American countries is between US$40 and US$70 with a few countries enjoying a much higher minimum wage (Chile, Paraguay and Costa Rica). The two Asian countries have minimum wages of around US$100 a month. The minimum wage is above the poverty line at US$1 a month in most, though not all, countries. In contrast, the minimum wage in dollars is below the poverty line at US$2 a month in all Saharan African countries except Senegal and also in a few countries of Latin America. Obviously, we are ignoring the fact that a minimum wage earner may be the main income support of a household when making the comparison between the level of the minimum wage and the poverty line.

Table 5 gives the results of regressing poverty on national minimum wages expressed in dollars, on average wages in dollars, GDP per capita and location. Several measures of poverty are used: the share of population living below the national poverty line and the share of population living with less than US$1 and US$2 a day. The second column of Table 5 shows that the level of the minimum wage in dollars is a negative and significant determinant of the level of the national poverty line. What is more striking is the finding that this relationship persists after controlling for the average wage. The relationship between the minimum wage and poverty remains when the level of development, as approximated by GDP/capita and location are introduced as explanatory variables.[5] This can be seen from the bottom of Table 5 (second column), which relates the share of population in poverty to GDP per capita in dollars GDPCAP, minimum wage in dollars MINWDOL, average wage in dollars AWAGEDOL and four regional dummies.

[5] The correlation between GDP/capita and the minimum wage in dollars is 0.29 and that between the minimum and the average wage is 0.75.

Table 4: Ratio of minimum wages to poverty lines in developing countries

Region	Country	Year	MW	$1 a day	$2 a day
North Africa	Morocco	1996	157.5	4.9	2.5
	Tunisia	1993	119.4	3.7	1.9
	Algeria	1990	111.7	3.4	1.7
Sub-Saharan Africa	Burkina Faso	1996	48.3	1.5	.7
	Botswana	1996	40.7	1.3	.6
	Togo	1993	48.6	1.5	.7
	Niger	1994	33.8	1.0	.5
	Mali	1996	28.2	.9	.4
	Malawi	1986	11.05	.3	.2
	Benin	1996	32.8	1.0	.5
	Côte d'Ivoire	1996	8.9	.3	.1
	Senegal	1996	70.3	2.2	1.1
Latin America	Mexico	1996	67.9	2.1	1.0
	Venezuela	1996	70.3	2.2	1.1
	Uruguay	1996	76.6	2.4	1.2
	Peru	1989	42.8	1.3	.7
	Paraguay	1997	241.2	7.4	3.7
	Ecuador	1989	60.8	1.9	1.0
	Costa Rica	1985	110.2	3.4	1.7
	Colombia	1992	61.5	1.9	.9
	Chile	1995	127.8	3.9	2.0
	Brazil	1994	67.0	2.1	1.0
	Bolivia	1996	43.9	1.4	.7
	Guatemala	1992	62.7	1.9	1.0
	Guyana	1996	45.3	1.4	.7
	El Salvador	1990	44.2	1.4	.7
Asia	Azerbaijan	1993	5.0	.15	.08
	Turkey	1996	138.3	4.3	2.1
	Philippines	1992	85.6	2.6	1.3
	Thailand	1994	105.3	3.3	1.6
	Syria	1989	115.8	3.6	1.8

Source: ILO minimum wages expressed in US dollars. The poverty lines are $1 a day and $2 a day in 1985 prices, equivalent to $1.08 a day and $2.15 a day in 1993 prices when adjusted for purchasing power parity using rates from the Penn World Tables.

Table 5: OLS regression of poverty measures on the minimum wage (SE in parenthesis)

Variables	National	$1 a day	$2 a day
MINWDOL/1000	-.771**(.271)	-.430 (.334)	-.906** (.439)
R-squared	.223	.049	.138
Observations	22	17	17
MINWDOL/1000	-.901** (.417)	-.078 (.200)	-.502 (.321)
AWAGEDOL/1000	-.055(.151)	-.185* (.106)	-.233 (.162)
R-squared	.479	.237	383
Observations	18	13	13
MINWDOL/1000	-.823** (.376)	-.296 (.358)	-.763 (.478)
AWAGEDOL/1000	-.052 (.000155)	-	-
GDPCAP/1000	-.023 (.022)	-.076 (.049)	-.080 (.056)
R-squared	.499	.237	.266
Observations	18	17	17
MINWDOL/1000	-.676*(.388)	-.067* (.326)	-.312 (.412)
AWAGEDOL/1000	-.018(.159)	-	-
GDPCAP/1000	-.063*(.0348)	-.043(.035)	-.051 (.041)
LATIN	.165**(.086)	.184**(.035)	.223**(.047)
NORTHAF	-.045(.091)	-.028 (.048)	-.078 (.065)
AFRICA	.099*(.114)	.442**(.096)	.487**(.100)
R-squared	.722	.79	.79
Observations	18	17	17

The independent variable is the percentage of population below the poverty line. Robust standard errors are in parenthesis (White estimator). ** indicates the coefficient is significant at the 5 per cent level and * at the 10 per cent level.

The effect of the regional dummies is estimated with respect to the effect of poverty in Thailand and the Philippines. The regression shows that for a constant level of GDP per capita and average wage and controlling for location, a higher minimum wage is associated with a lower national level of poverty. With the help of the estimated coefficients, it is now possible to calculate the elasticity of poverty with respect to changes in the minimum wage. This value is often estimated by computing it at sample means, where the minimum wage is in our case US$214 a month and the poverty rate, 31.6 per cent. The elasticity at sample means is equal to 0.459: a 1 per cent increase in the minimum wage is equivalent to a 0.46 per cent reduction in the level of poverty. Finally, the fit of the regression is rather good (R2=.48).

The above analysis is based on the national poverty line. The regression can also be run on a smaller group of countries using the US$1 or the US$2 a day poverty line. The share of population below these two poverty lines is taken from the World Bank (2000). As can be seen from the third column of Table 5, the level of the minimum wage in dollars is not significantly associated with the share of population below US$1 a day. In fact, none of our independent variables is able to explain the level of poverty using the US$1 a day threshold. This result confirms our intuition that minimum wages in developing countries do not apply to the poorest share of the population, but rather to the less poor of the low-income population.

Indeed, the minimum wage in dollars is a significant determinant of the larger share of the population below US$2 a day (fourth column of Table 5). However, the coefficient of the minimum wage becomes insignificant when adding controls for GDP per capita, average wage and location.

As this study focuses on poverty, wages in dollars are expressed using the PPP conversion factor developed by the World Bank. Estimating the equations with wages expressed in dollars using the official exchange rate leads to the same conclusion as to the impact of the average and the minimum wages on poverty.

In conclusion of the above analysis, we can say that there are indications that a higher minimum wage is associated with a lower level of poverty. This result does not imply *per se* that setting a higher minimum wage would reduce poverty but is merely the sign of a correlation between both variables. This correlation could for instance indicate that countries with a high minimum wage are also more committed to the reduction of poverty and have developed social policies targeted to the poor. Furthermore, there seems to be little relation, if any, between the minimum wage and extreme poverty as measured by the US$1 a day international poverty line.

Unemployment

Indicators of poverty other than poverty lines have been suggested to measure the minimum wage effect such as the level of unemployment. Lustig & Mcleod (1997) for instance evaluate the effect of changes in real minimum wages on changes in unemployment rates controlling for real public spending, human capital and terms of trade. The study concludes that the real minimum wage increases unemployment, a result that is often quoted in the literature (for example, Inter-American Development Bank, 1998). The way the independent variable unemployment is defined is not clear from this analysis as "the unemployment variable is the change in the unemployment rate divided by the number of years in the interval"; it is therefore difficult to reproduce these results. However, using a bigger sample of 40 observations, we found the opposite result: an increase in the minimum wage with respect to the average wage decreases the unemployment rate (Table 6). This result remains remarkably stable across specifications and using various definitions of the variables. This regression explains however very little of the variation of unemployment rates as the R2 is less than 10 per cent.

Table 6: OLS regression of the level of unemployment on the minimum wage

	Specification 1	Specification 2	Specification 3	Specification 4
MW/AW	-.975** (.409)	-.828* (.464)	-1.023** (.473)	-1.156 (.723)
ASIE	-.002 (.086)	.005 (.089)	-012 (.099)	.028 (.112)
GDP	-	-.010 (.011)	-.003 (.013)	-.000 (.018)
DTRADE	-	-	-.012 (.012)	-.014 (.016)
LNEDUC	-	-		.002 (.212)
Observations	38	36	33	29
R2	09	.12	.14	.12

The independent variable if log change in employment from one year to another. Robust standard errors are in parenthesis (White estimator). ** indicates the coefficient is significant at the 5 per cent level and * at the 10 per cent level.

Therefore, we do not infer any conclusion on the link between the unemployment rate and the minimum wage.

5. Conclusion

After years under attack for its negative effect on low-paid employment, the minimum wage seems to be back in favour as a mean of providing unskilled workers with decent living conditions. Several factors are responsible for the renewed interest in the minimum wage as a tool of market policy. First, several 1990s studies showed that the minimum wage had little, if any, disemployment effect. Second, there is a new human rights approach that focuses on the right to have decent employment. In the developing world, policy makers are not only concerned with the impact of the minimum wage on employment, but also with its impact on the level of poverty. Both effects are difficult to estimate in the presence of the uncovered sector and practises of non-compliance.

From the theoretic literature review on the minimum wage, we concluded that the static model of pure and perfect competition (homogeneity of goods and workers, perfect information, many small suppliers and buyers) is a unique case where the minimum wage has a definite negative effect on employment. If one of the hypotheses of perfect competition is removed (workers are heterogeneous or paid the efficiency wage, there are a few employers) or dynamics are introduced (minimum wage affects the household's labour supply or the aggregate demand), the impact of the minimum wage on employment cannot be predicted in advance. This seems to be valid also in an economy with a sizeable informal sector. It is therefore not surprising that many empirical studies could not find evidence of a negative effect for moderate increases in the minimum wage on employment. As far as the impact of the minimum wage on the level of poverty in developing countries is concerned, predictions of theoretic models are less firm. At least one empirical and cross-country study showed that increases in the minimum wage are associated with a lower level of poverty when other factors are held constant.

This paper shows evidence of a high instability of the minimum wage in real terms in many developing countries. Yet some countries have been able to protect the purchasing power of minimum wage earners better than others. The ratio of the minimum wage to the average wage in manufacturing is shown to vary considerably between countries and within countries across time. In some countries, the minimum wage appears to be *relatively* stable

over time with respect to the average wage. Internal stability, however, does not imply a lack of variance among countries. For example, minimum wage levels in Malawi (1980-1986) and in Bolivia (1991-1996) represented less than 20 per cent of the average manufacturing wage. In contrast, the ratio is around 40 per cent in Botswana (1981-1997) while modestly increasing from 48 per cent to 54 per cent of the average wage in Thailand (1986-1994). Finally, the proportion of the minimum wage to the average wage swings over time in a number of countries (The Philippines, for instance, experienced a continuous decrease in the ratio, a decline from more than 60 per cent in 1981 to around 35 per cent in 1992).

The time series data on the informal economy in Latin America were used to analyse the relationship between the growth of the informal economy and changes in the minimum wage. A simple reduced form is tested. On the labour supply side, change in GDP/capita should measure the income incentive associated with the supply of labour in the informal economy while on the labour demand side, change in the ratio of the minimum to the average wage represents changes in the flexibility of the labour market for unskilled labour with respect to more skilled labour. Our independent variable is the annual change in the share of the informal economy. The results of this regression suggest that increases in GDP/capita tend to reduce urban informal employment significantly. In contrast, changes in the ratio of the minimum wage to average wage seem to exert no significant impact on the share of the informal economy. This result tends to support the view that labour market rigidity and more specifically low wage rigidity is not the main responsible for the informality of Latin American economies.

One of the main objectives of this study is to determine the relationship between changes in employment and changes in the ratio of the minimum to the average wage (which measures the relative price of unskilled labour and therefore the bite of the minimum wage in the wage structure). We thus estimated a regression that related changes in the ratio of employment to population to the following variables: changes in the ratio of the minimum to the average wage, growth of the real average wage, changes in the terms of trade, GDP growth and changes in educational levels). Our results suggest that other things equal, the level of the minimum wage has an insignificant effect on the level of employment.

The number of countries in our sample enables us to estimate the effect of the minimum wage on the level of poverty using cross-section data. As expected, the level of the minimum wage (in dollars) is a negative and significant determinant of the level of poverty. What is more striking is that this relationship persists after controlling the level of development, as approximated by GDP/capita, average wage in manufacturing and location. The regression shows that for a constant level of GDP per capita and average wage in manufacturing, and controlling the location, a higher minimum wage is associated with a lower national level of poverty. This analysis was based on national poverty lines. Using a smaller group of countries, the regression could be run using the US$1 or US$2 a day international poverty line. The result shows that the level of the minimum wage in dollars is not significantly associated with the share of population earning below US$1 a day. This result confirms our intuition that minimum wages in developing countries do not affect the poorest share of the population, but rather the upper levels of the low-income population.

In contrast, the minimum wage in dollars does correlate with the share of the population earning below US$2 a day. Still the minimum wage is not significantly associated with a lower level of poverty at US$2 a day when other factors are held constant.

This result gives some support to the idea that national poverty lines, which are defined with respect to income distribution seem to correspond more closely to the ILO "decent work" approach to poverty reduction.

In conclusion, the data analysis gives strong support to the idea that the minimum wage may bring positive results in poverty alleviation by improving the living conditions of workers and their families while having no negative results in terms of employment. No

evidence of the effect of the size of the minimum relative to the average wage on the size of the informal economy in Latin America was found either.

Yet the consequences of setting a minimum wage are manifold and go beyond the impact on the level of employment and poverty. Raising the minimum wage may have an effect on incentives to provide training and productivity, as well as on working conditions and prices. Yet, effects other than on poverty and employment levels have received little attention even within the context of the more industrialized developing countries. The idea that a decent minimum wage may force firms of these countries to use more efficiently their labour force has yet been little explored.

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Appendix

Figure 1: Evolution of minimum wage in real terms (1980-1998) – Asia

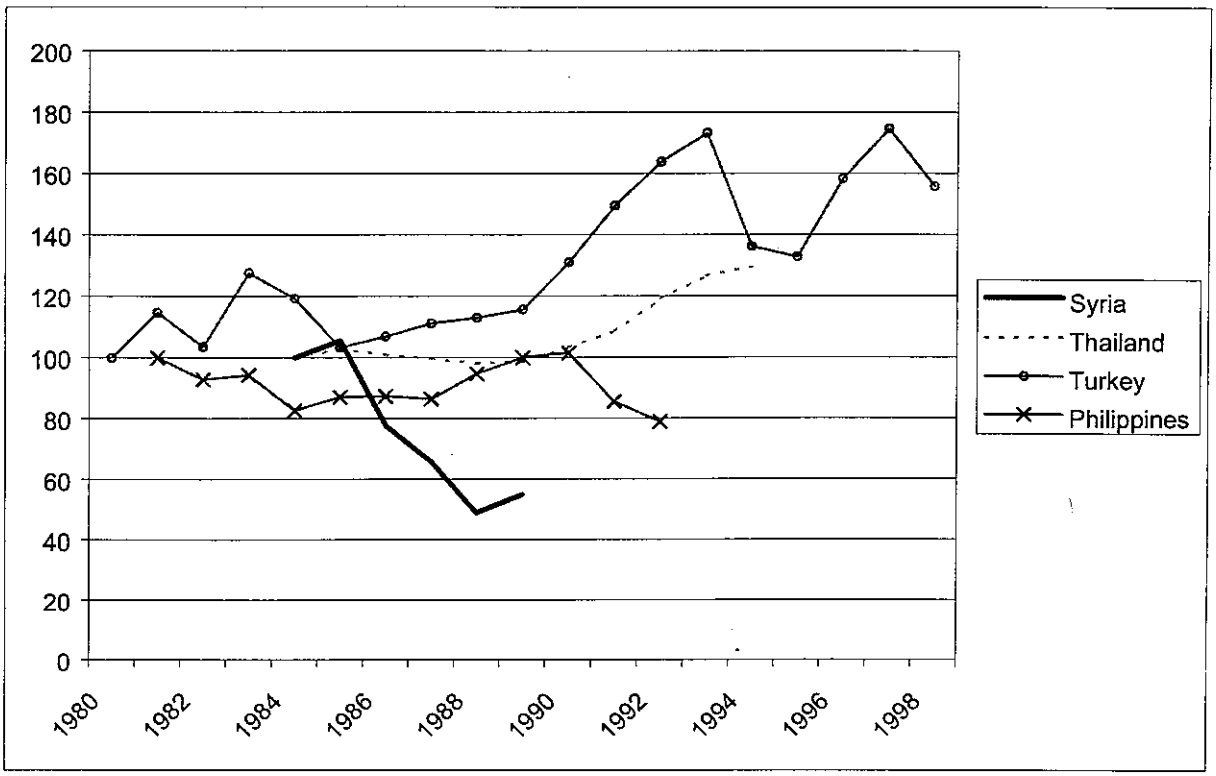


Figure 2: Changes in the real minimum wage (1980-1998) – North Africa

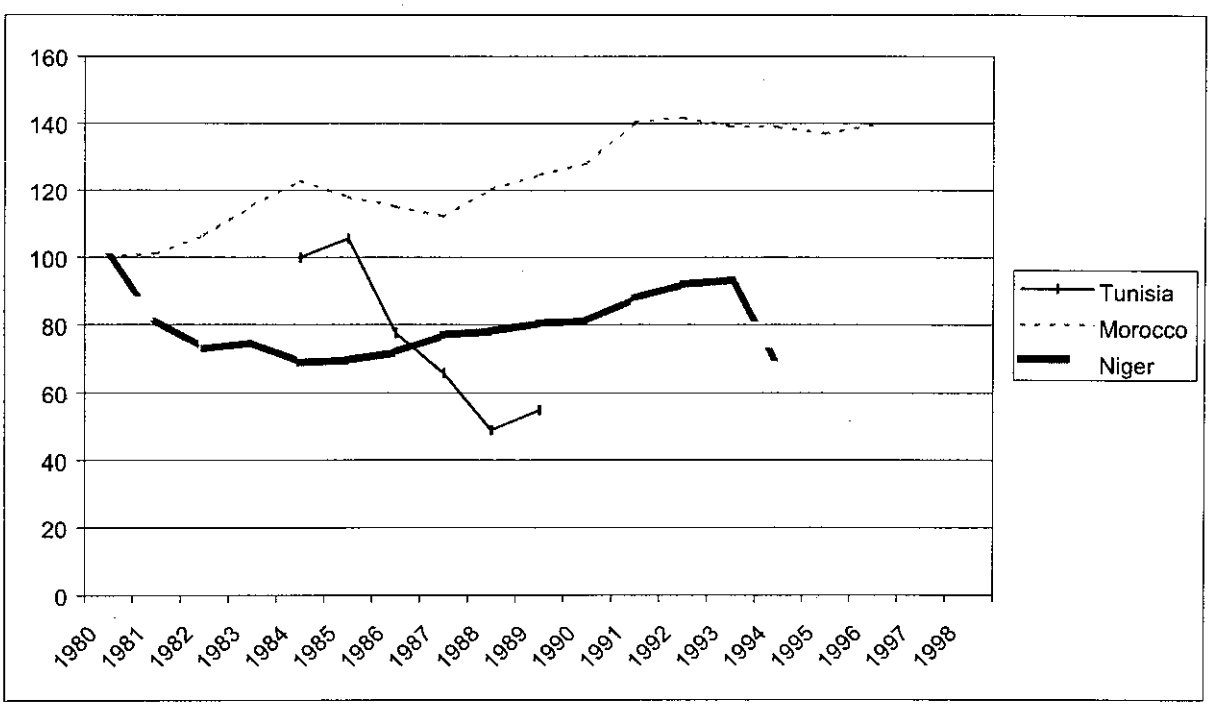


Figure 3 a: Change in the real minimum wage (1980-1998) – Africa

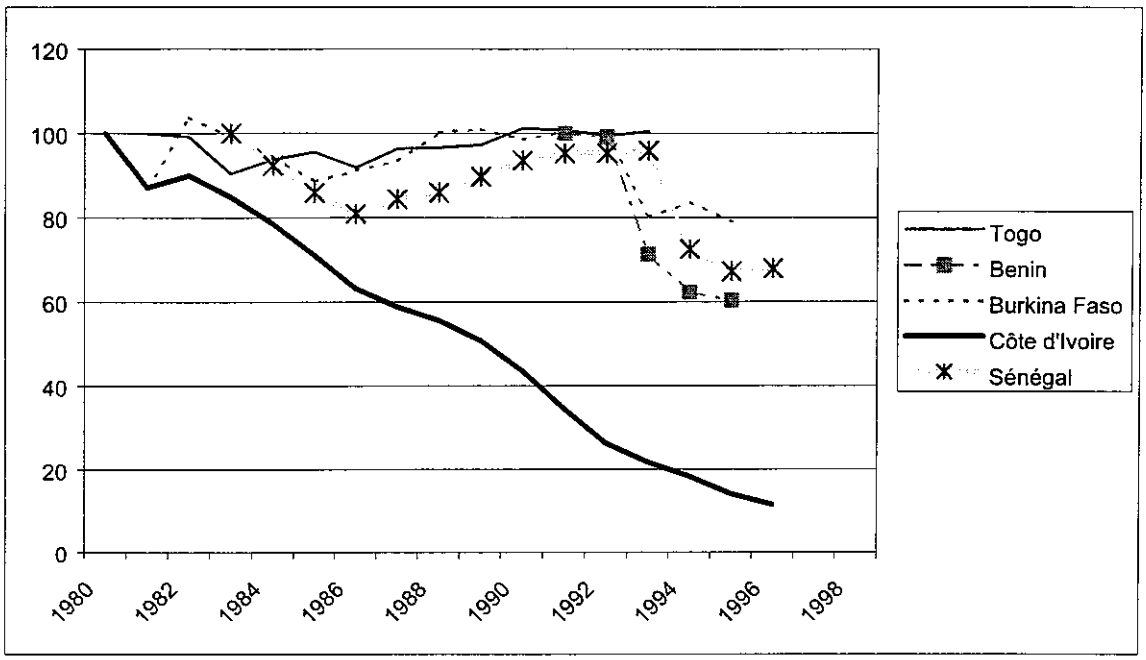


Figure 3 b: Change in the real minimum wage (1980-1998) – Africa

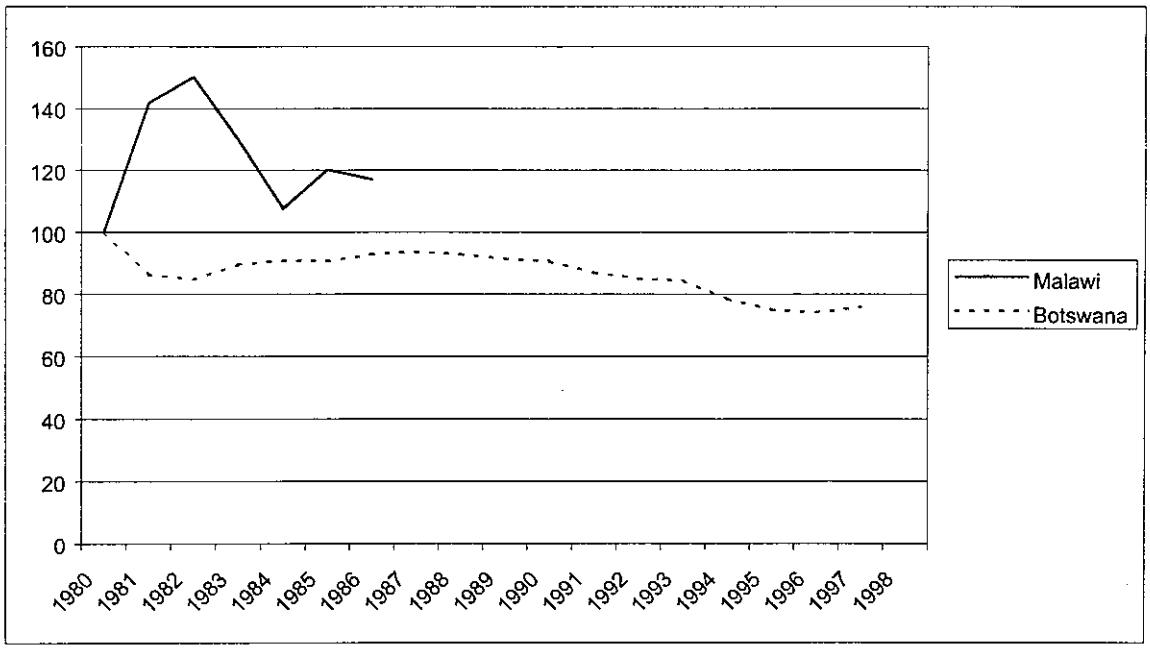


Figure 4a: Change in the real minimum wage (1980-1998) – Latin America

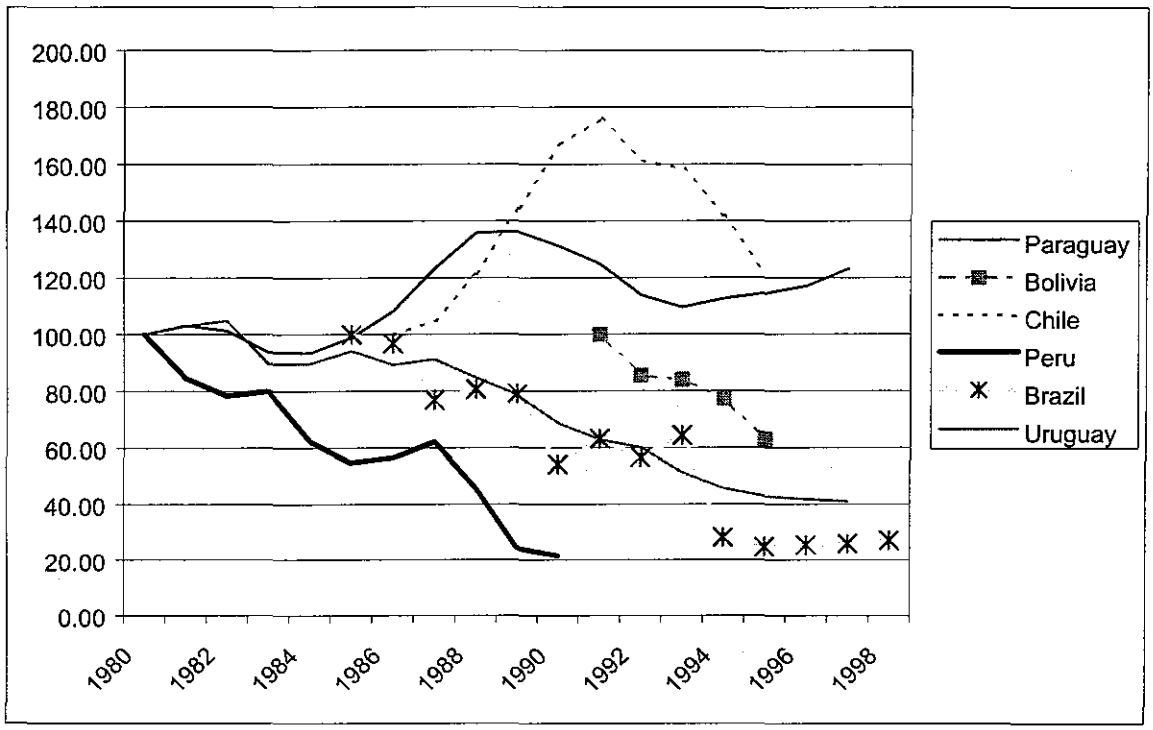


Figure 4b: Change in the real minimum wage (1980-1998) – Latin America

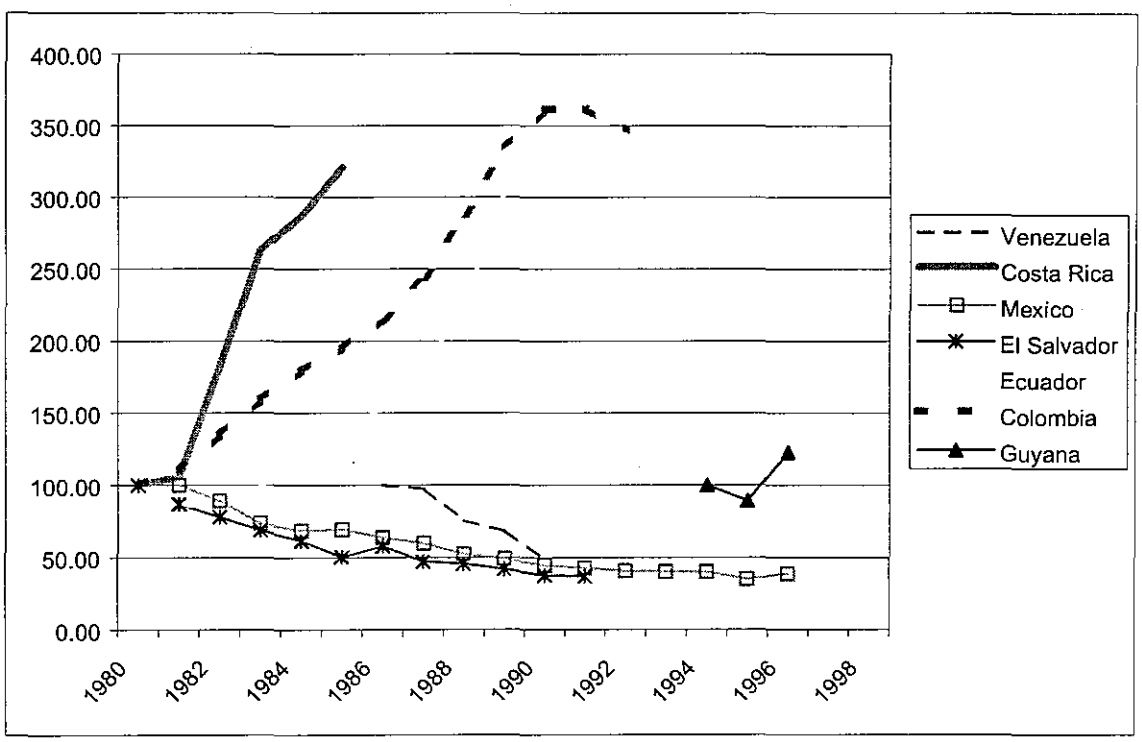


Figure 5a: Ratio of minimum wage over average wage (1980-1998) - Latin America

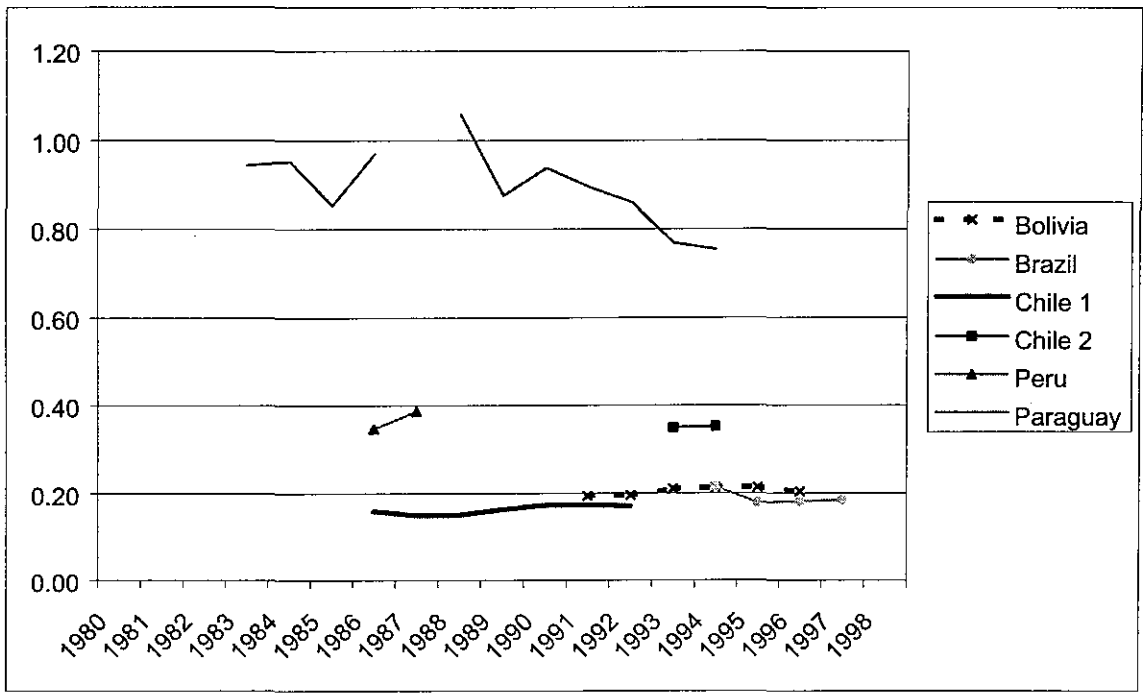


Figure 5b: Ratio of minimum wage over average wage (1980-1998) - Latin America

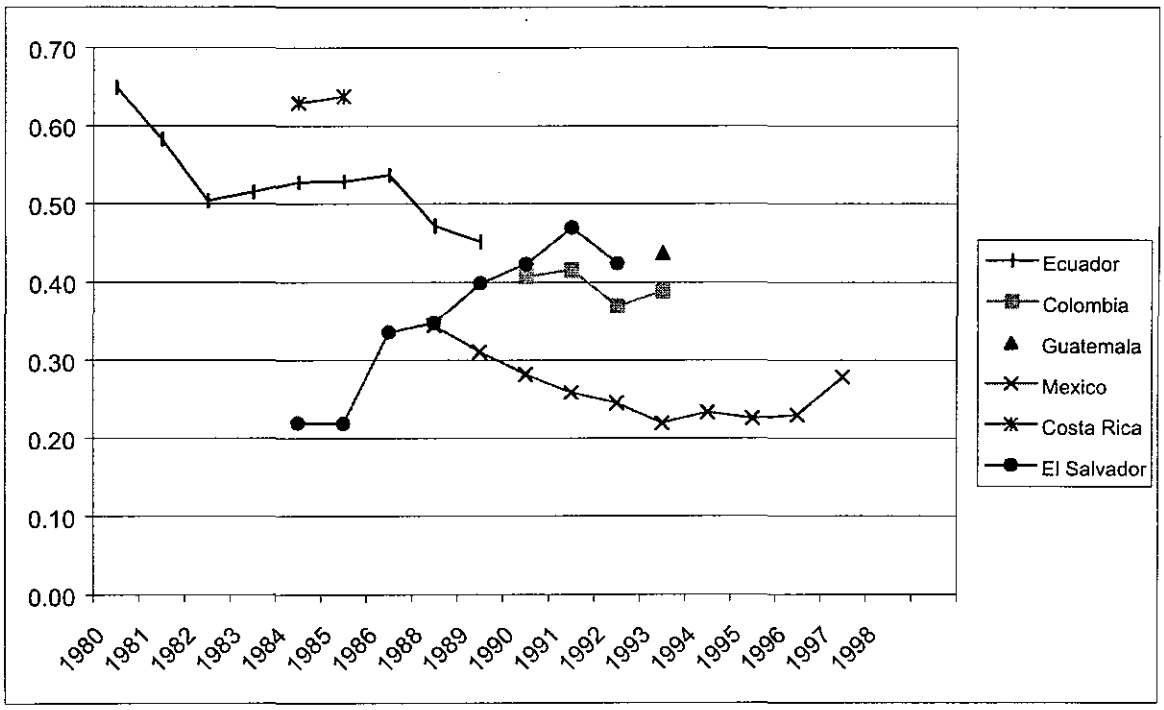


Figure 6: ratio of minimum wage over average wage (1980-1998) - Asia

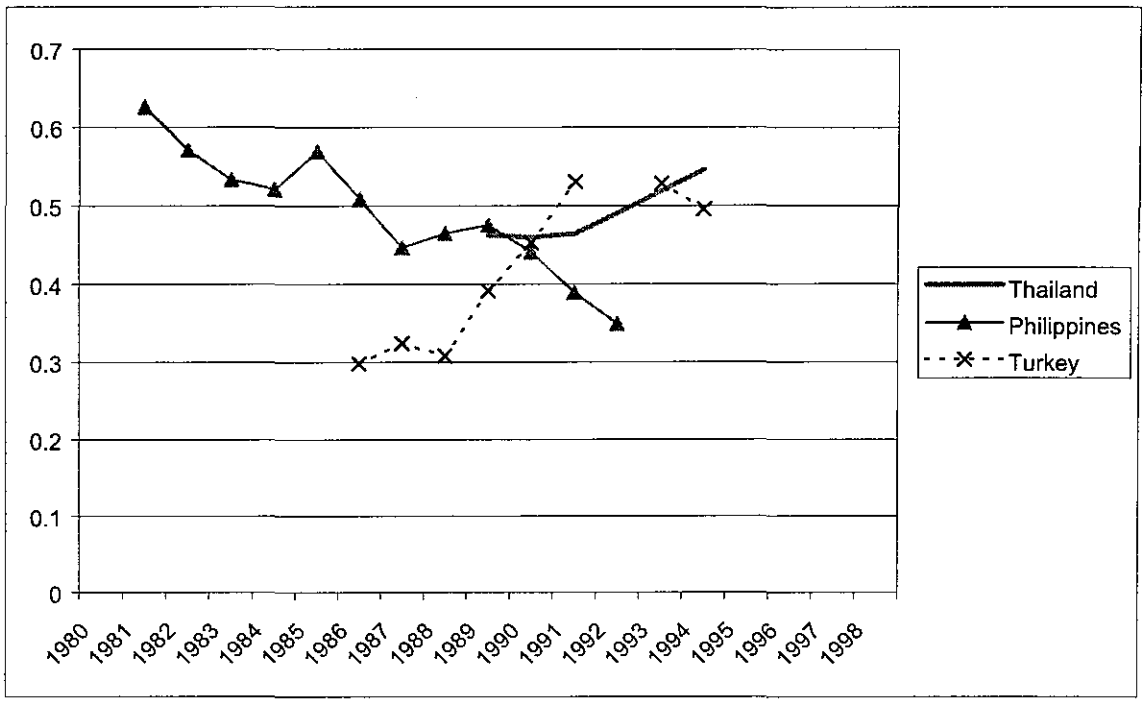
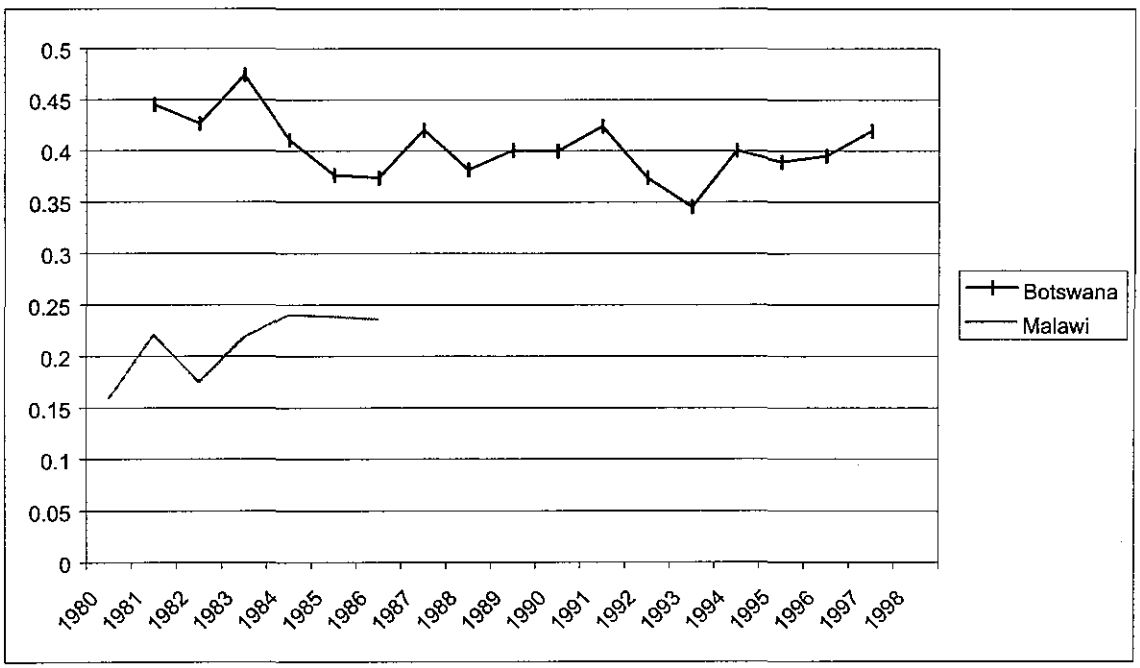


Figure 7: Ratio of minimum wage over average wage (1980-1998) - Africa



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