Chapter 5: Economic Freedom and Unemployment

by Horst Feldmann

1 Costs of unemployment

Unemployment is costly to the individuals and families directly affected as well as to the economy and society as a whole. It is a waste of scarce resources, leading to a loss of income and potential output. For example, from his review of the relevant literature, Dawson (1992) concludes that, for the United Kingdom, an unemployment rate of almost 11% in 1983 entailed the loss of at least 11% to 12%, and probably 14%, of potential GDP. In the United States, an unemployment rate of 9% was associated with the loss of almost 7% of GNP. Kenyon (1998) estimates that, in Australia, the loss of GDP associated with an unemployment rate above the full employment level is the equivalent of a whole year's worth of GDP over the past two decades.

Long spells of unemployment erode the technical and social skills of those who are out of work, reducing their employability. The longer someone remains out of a paid job, the less attractive he becomes to a potential employer. Thus unemployment may become persistent, causing a permanent loss of human capital and potential output.

As unemployment benefits in most countries are low and their duration short, and as they are non-existent in many developing countries, laid-off workers and their families often end up in poverty. If they are unable to pay their rent or mortgages, they may even become homeless. Furthermore, unemployment is associated with fiscal costs to the government. A rise in unemployment increases government outlays—particularly, unemployment benefits and other welfare payments. As unemployment reduces output and aggregate income, it also lowers tax revenues, both from direct taxes such as income tax and from indirect taxes such as value-added tax. The fiscal costs can be substantial—especially in countries with generous benefit systems, high tax rates, or both. For example, fiscal costs were equivalent to 4.2% of GDP in Germany in 1999, when its unemployment rate stood at 8.4% (Franz, 2003).

Joblessness leaves permanent scars on individuals. In Britain, a spell of unemployment has been found to carry a wage penalty of 6% on re-entry and 11% in the long run (Arulampalam, 2001). In the United States, the effect of displacement on earnings has been found to be quite persistent too. For example, according to Stevens (1997), earnings reductions six years after a job loss are 9%. She finds that much of this persistence can be explained by additional job losses in the years following an initial displacement.

Unemployment also has a large adverse impact on people's subjective well-being. For example, using data on Great Britain, Clark and Oswald (1994) find that unemployed people have much lower levels of mental well-being than those in work. For an individual's well-being, being unemployed is worse than divorce. Similarly, according to Winkelmann and Winkelmann (1998), being unemployed had a large negative impact on life satisfaction among German working-age men. This non-pecuniary effect is much larger than the effect that stems from the associated loss of income. Also using German data, Clark et al. (2001) find that the adverse psychological effect of being unemployed is persistent: unemployment experienced in the past makes an individual less satisfied with his current life situation even if he has become re-employed in the meantime.

Unemployment diminishes well-being of everyone, not just of the unemployed. Using data on 12 European countries and the United States, Di Tella et al. (2001) find that randomly sampled individuals mark systematically lower in surveys of well-being when there is unemployment in their country. According to their study, unemployment depresses well-being almost twice as much as inflation does. In subsequent research using the same data, Di Tella et al. (2003) find that, although the effect on someone who actually loses his job is 20 times larger than the effect on someone who remains employed, the indirect losses in well-being are larger, in aggregate, because they affect more people.

Furthermore, unemployment has a negative impact on health of the affected individuals. Using data on American men, Linn et al. (1985) report that, after losing their job, symptoms of depression and anxiety were significantly greater in the unemployed than in the employed. Similarly, using a sample of German blue-collar workers, Frese and Mohr (1987) find that prolonged or repeated unemployment leads to depression.

Being unemployed even appears to reduce workers' life expectancy. Surveying the relevant literature from various industrial countries, Brenner and Mooney (1983) point out that unemployment is directly related to higher mortality rates, particularly due to cardiovascular disease, liver cirrhosis, and suicide. Similarly, in their more recent survey of 46 research articles, Jin et al. (1995) point out that large, census-based cohort studies show higher rates of overall mortality, death due to cardiovascular disease, and suicide among unemployed men and women than among either employed people or the general population.

Unemployment also involves psychological costs for young people. For example, Banks and Jackson (1982) find that the experience of unemployment probably created symptoms of minor psychiatric morbidity among British youth. Similarly, Goldsmith et al. (1996, 1997) report that, in the United States, joblessness damaged self-esteem for young females (but not for male youth).

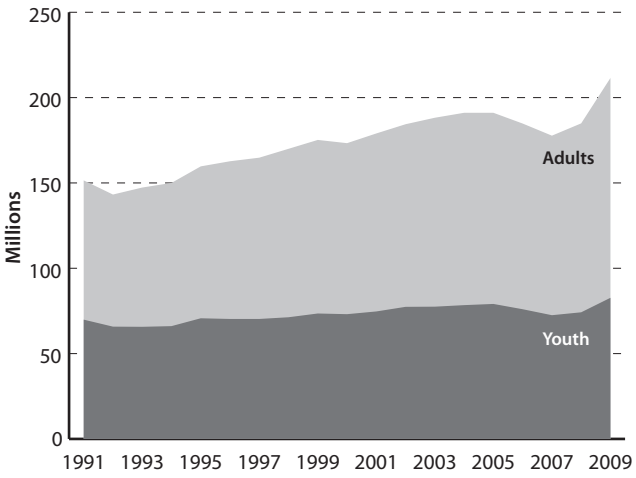
For young people as for adults, unemployment not only causes current hardship but may also hinder future economic success. Using data on young American men, Ellwood (1982) reports that, although early unemployment does not set off a vicious cycle of recurrent unemployment, lost work experience leads to substantially and persistently lower wages.

Finally, there is evidence that unemployment increases crime: using US data, both Raphael and Winter-Ebmer (2001) and Lin (2008) find strong effects of unemployment on property-crime rates. According to Lin (2008), a one-percentage-point rise in unemployment increases property crime by 4% to 6%. By contrast, there is only weak evidence that a rise in unemployment increases violent crime (Raphael and Winter-Ebmer, 2001).

2 Characteristics of unemployment

Unemployment affects millions of people around the world (figure 5.1). In 2009, the total number is estimated to have been 211.5 million. Although the current financial and economic crisis led to a particularly marked increase in unemployment, the global number of unemployed was

Figure 5.1: Unemployment worldwide, adults and youth



Note: Youth are defined as persons aged between 15 and 24 years; adults are those aged 25 years and above.
Source: International Labour Office, 2010.

enormous even before the start of this crisis. For example, between 1991 and 2007 it averaged 170.2 million. Actually, there was a trend increase throughout the last two decades. Thus unemployment has been a severe and growing problem for many years.

The extent of unemployment varies substantially across the globe (figure 5.2). North Africa has the highest regional unemployment rate: on average from 1991 to 2009, it amounted to 12.4%. The Middle East as well as Central and South-Eastern Europe (non-EU) and the Commonwealth of Independent States are suffering from high joblessness too. Over the same period, unemployment in these regions averaged 9.7% and 10.0%, respectively. Most countries in sub-Saharan Africa and in Latin America and the Caribbean have also had mass unemployment for many years. Between 1991 and 2009, their regional unemployment rates averaged 8.1% and 8.0%, respectively.

By contrast, most Asian countries have been quite successful in keeping unemployment low (figure 5.2). Countries in East Asia have been the most successful. On average over 1991 to 2009, their regional unemployment rate was a mere 4.3%. Most countries in South Asia and in South-East Asia and the Pacific have been enjoying comparatively low unemployment as well. On average over 1991 to 2009, the unemployment rate stood at 4.6% in the former region and at 5.0% in the latter. Remarkably, it hardly rose in these regions during the current financial and economic crisis.

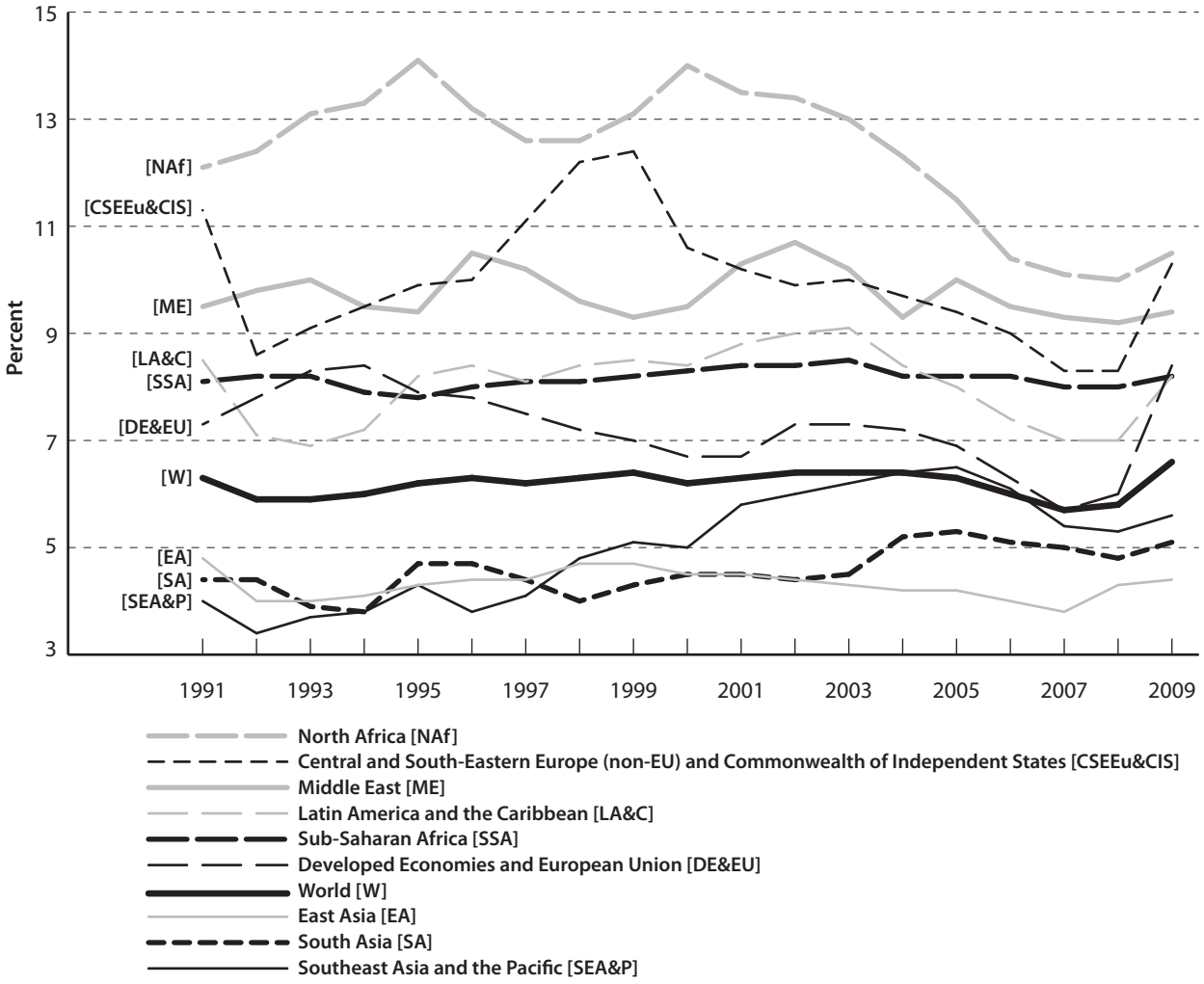
Although unemployment is a persistent problem almost everywhere, there had been substantial improvements in several regions before the start of the current

crisis (figure 5.2). Central and South-Eastern Europe (non-EU) and the Commonwealth of Independent States experienced the greatest improvements. Here, the regional unemployment rate fell by one third from 1999 to 2007. Developed economies and the EU managed to reduce unemployment by almost the same proportion from 1994 to 2007. Between 2000 and 2008, the North African unemployment rate decreased by 29%. In Latin America and the Caribbean, the regional unemployment rate fell by almost a quarter from 2003 to 2007. Unfortunately, these gains were partly or even completely reversed during the current crisis. The reversal was particularly strong in developed economies and the EU as well as in Central and South-Eastern Europe (non-EU) and the Commonwealth of Independent States.

Young people are particularly harshly affected by unemployment. On average from 1991 to 2009, more than two fifths of all unemployed—73.1 million people—were between 15 and 24 years old (figure 5.1). During the same period, the world youth unemployment rate was almost twice as high as the unemployment rate for the total labor force—12.3% compared to 6.2% (figures 5.2 and 5.3).

The regional variation in youth unemployment is similar to the one for total unemployment. North Africa has the highest youth unemployment rate (figure 5.3). Between 1991 and 2009, it averaged no less than 27.3%. In the Middle East as well as in Central and South-Eastern Europe (non-EU) and the Commonwealth of Independent States, about a fifth of all young people were unemployed. In developed economies and the EU, South-East Asia and the Pacific as well as in Latin America and the Caribbean, about one out of 7 youth were unemployed during this period. East Asia is the only region that continuously managed to keep its youth unemployment rate below 10% between 1991 and 2009.

Figure 5.2: Unemployment rate for various regions, 1991–2009



Source: International Labour Office, 2010.

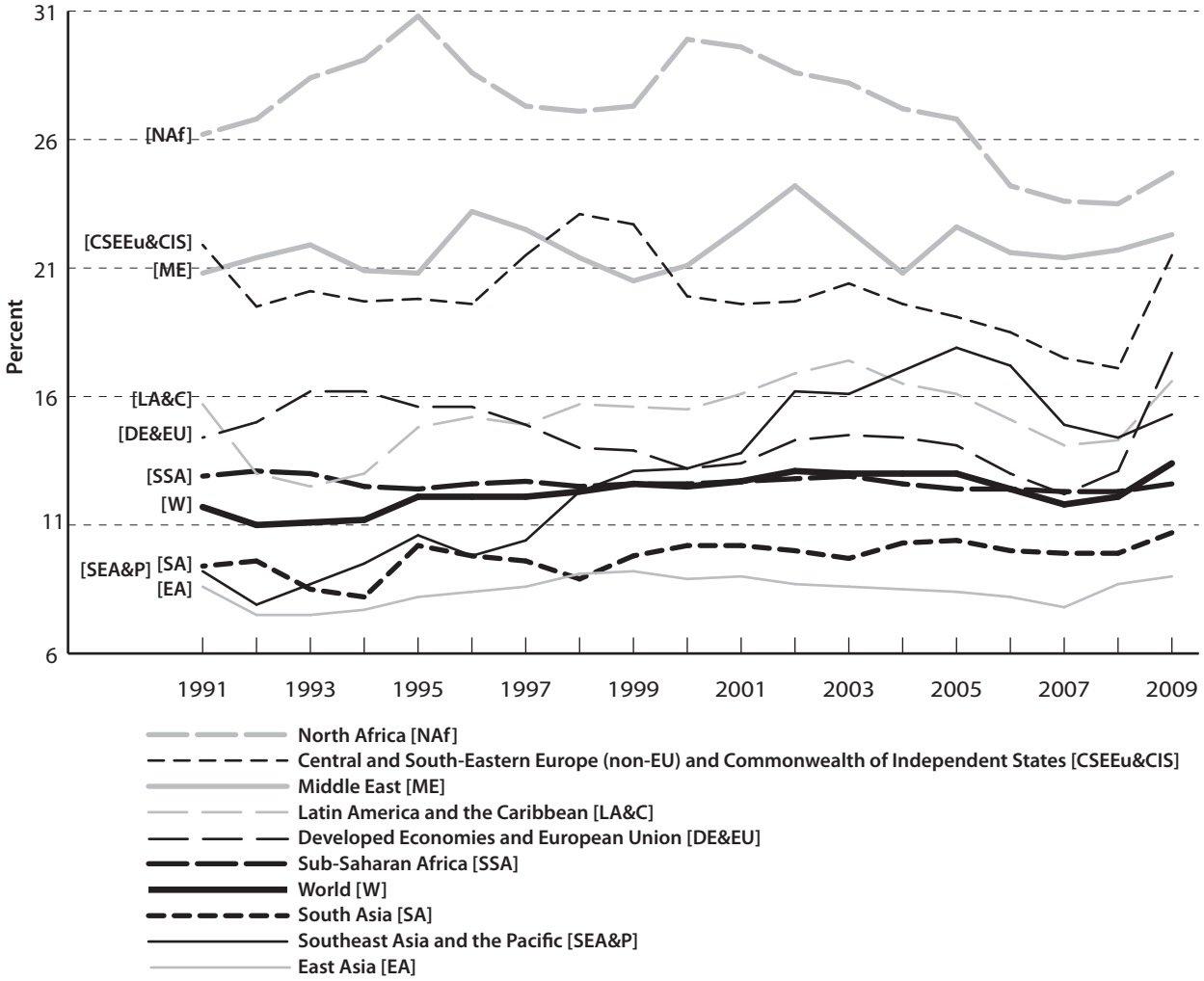
Despite this dismal overall picture, there were encouraging developments in youth unemployment before the start of the current financial and economic crisis (figure 5.3). Specifically, in Central and South-Eastern Europe (non-EU) and the Commonwealth of Independent States, the youth unemployment rate fell by more than a quarter from 1998 to 2008. In North Africa, it decreased by more than a fifth from 2000 to 2008. It fell by almost a fifth in Latin America and the Caribbean from 2003 to 2007 as well as in South-East Asia and the Pacific from 2005 to 2008. Unfortunately, young people were hard hit by the current crisis. Their unemployment rate rose particularly strongly in developed economies and the EU as well as in Central and South-Eastern Europe (non-EU) and the Commonwealth of Independent States.

3 Previous research

Economic freedom is likely to affect unemployment favorably. As it provides a framework for voluntary exchange as well as for freedom to enter and compete in markets, it probably reduces unemployment both directly by improving the functioning of the labor market and indirectly by stimulating economic development. Both effects are likely to benefit youth in particular because young people switch between jobs as well as between education and the labor force more often than older workers. Also, as they often are the last to be hired and the first to be fired, they are likely to benefit disproportionately from faster economic development caused by more economic freedom.

A substantial body of evidence supporting these hypotheses has accumulated in recent years. For example,

Figure 5.3: Youth unemployment rate for various regions, 1991–2009



Source: International Labour Office, 2010.

using country averages from 45 industrial and developing countries, Feldmann (2007) finds that a higher level of economic freedom in 1980/1985 is correlated with a decline in both the unemployment and the youth unemployment rate over the period to 2000–2003. Furthermore, he finds an increase in economic freedom from 1980/1985 to 2000–2003 to be associated with a fall in the youth unemployment rate over the same period. Additionally, using panel data from 81 industrial and developing countries he finds that a higher level of economic freedom is correlated with a lower youth unemployment rate.

Feldmann, who has used the index published in *Economic Freedom of the World* (EFW index) throughout, has also studied the effects of particular economic freedoms. His main findings can be summarized as follows.

Size of government

A smaller size of the government sector is likely to reduce unemployment, both among the total labor force as well as among young people. This is the result of a study covering both industrial and developing countries (Feldmann, 2007), a study that focuses on industrial countries (Feldmann, 2006a), as well as two studies on developing countries that use different methodologies (Feldmann, 2009a, 2010).

Rule of law and security of property rights

A stronger rule of law and more secure property rights appear to favorably affect unemployment as well. Using data from a large sample of industrial and developing countries, Feldmann (2007, 2009b) finds that they are likely to reduce both the total and the youth unemployment rate.

International exchange

Using data on 45 industrial and developing countries, he finds a more liberal regime for international exchange in 1980/1985 to be associated with a decline in both the total and the youth unemployment rate over the period to 2000–2003 (Feldmann, 2007). Additionally, a more comprehensive liberalization of international trade and capital movements from 1980/1985 to 2000–2003 is associated with a fall in youth unemployment over the same period.

Regulation

Feldmann (2007) also finds that more flexible regulation in 1980/1985 is associated with a fall in unemployment among the total labor force as well as among youth over the period to 2000-2003 and that a more comprehensive deregulation from 1980/1985 to 2000–2003 is associated with a fall in the unemployment rate over the same period. In several additional papers, he analyzes each type of regulation—credit market, labor market, and business regulation—in some detail using data from a large sample of industrial and developing countries. In each case, he finds that more flexible regulation is likely to lower both the unemployment and the youth unemployment rate (Feldmann, 2006b, 2008, 2009c).

In all of these studies the estimated magnitude of the effect is larger for young people than for the total labor force.

4 Data and methodology

The remainder of this chapter studies the effects of aggregate economic freedom using data on 100 industrial and developing countries from the period 1980 to 2008. Thus, compared with previous papers, it uses a larger country sample and includes data on more recent years (for a list of countries, see Appendix A). As youth are particularly harshly affected by unemployment, we estimate the effect on both the total and the youth unemployment rate. Economic freedom is measured using the chain-linked EFW summary index (for definitions and sources of all variables, see Appendix B).

Most of our unemployment data come from the International Labour Office's *Key Indicators of the Labour Market* (2009). These data are based on labor-force surveys and, thus, do not refer to registered unemployment. Instead, they are based on an international standard that defines the unemployed as all persons above a specific age who, during the reference period, were without work, currently available for work, and seeking work. Although national coverage of unemployment can vary with regard to factors such as age limits and criteria for seeking work, the International Labour Office (ILO) has made great efforts to produce series that are comparable across countries. With regard to age limits, for example, almost all national series presented in this publication refer to the age group 15 years and older. Furthermore, the ILO has "cleaned" all national time series to eliminate breaks in series. Thus, these data are comparable over time. Although the ILO's labor-market performance data are not completely harmonized across countries, they are harmonized to a large extent.

To control for the impact of economic growth, we employ the GDP growth-rate variable. As unemployment usually responds to changes in growth after about one year, we lag this variable accordingly. GDP growth is an amalgam of the state of the business cycle with the rates

of population and productivity growth. In an attempt to capture cyclical conditions better, we construct a variable labeled "GDP growth gap" and substitute this variable for the GDP growth-rate variable in one of our robustness checks. We construct the GDP growth-gap variable by normalizing each country's GDP growth rate for its trend growth rate. The trend growth rate is calculated using the Hodrick-Prescott filter.[1]

For two reasons, we additionally control for GDP per capita. First, it is important to account for the effects of the huge cross-country differences in the level of economic development. Second, as richer countries usually enjoy more economic freedom, it is also important to ensure that our economic freedom variable does not proxy for the level of economic development.

We also control for the share of children in the population. This share varies widely across countries, especially between developing and industrial countries. Large variations in this share are likely to affect labor-market performance, particularly among young people. Several recent studies covering more than 70 countries indicate that a larger share is associated with more unemployment (Feldmann, 2006b, 2007, 2008).

In one of our robustness checks, we additionally control for the share of old people in the population. This share also varies widely across countries. A large share is likely to affect the labor market in several ways. For example, it usually entails high government outlays on pensions and health care, increasing the tax burden. The latter in turn dampens incentives to invest and work, probably raising unemployment. On the other hand, retired people usually spend not only their pensions but also a substantial amount of their savings on various leisure activities, which may stimulate economic growth and reduce unemployment. A large share of old people may also induce a substantial number of working-age people (particularly, women) to temporarily withdraw from the labor force to care for elderly relatives. This would reduce the unemployment rate if most of these working-age people had been unemployed before. It would increase the unemployment rate if most of them had a job before withdrawing from the labor force.

Furthermore, we employ a dummy variable for wars since they may severely disrupt the labor markets of the countries in which they take place. The variable takes all types of war into account: wars between two or more states, internal wars (with or without the intervention from other states) and wars between a state and a non-state group outside its own territory.

In one of our robustness checks, we additionally control for the impact of political rights and civil liberties. If citizens' rights to vote and to compete for public office are restricted and if freedom of the press and freedom of association are severely limited, the ruling group is likely to abuse its power for its private benefit, leading to widespread rent-seeking and corruption. Thus strict limits on political rights and civil liberties are likely to affect economic performance adversely, possibly raising unemployment.

In a further robustness check, we control for the impact of the real interest rate. A rise in the real interest rate lowers investment and labor demand, thereby increasing unemployment. There is some, albeit sometimes weak, evidence that high real interest rates are correlated with high unemployment in industrial countries (for example, Fitoussi et al., 2000; Blanchard and Wolfers, 2000; Nickell et al., 2005).

Our final robustness check additionally controls for the impact of inflation. High inflation rates distort price signals and relative prices, hampering the efficient allocation of resources. Furthermore, as profits are mostly taxed on a nominal basis, enterprises' real net return on investment decreases in an inflationary environment so that investment and economic growth are likely to decline in the long term. Both effects may lead to higher unemployment. On the other hand, if nominal wages are downward rigid, inflation may, upon the occurrence of shocks, facilitate the adjustment of real wages, lowering unemployment. Indeed, there is evidence for a permanent trade-off between inflation and unemployment at modest inflation rates in the United States (Akerlof et al., 1996, 2000; Groshen and Schweitzer, 1999) and other industrial countries (Wyplosz, 2001). As both the adverse and the beneficial unemployment effects of inflation are likely to materialize only after some time, we lag the inflation rate variable by one year.

In fact, all explanatory variables are lagged by one year, not just the variables GDP growth rate and inflation rate. Changes in economic freedom are likely to affect unemployment only after some time too. The same can be expected from changes in GDP per capita, the age structure of the population, political freedom, and the real interest rate. By lagging the respective variables, we allow for slow adjustment. Additionally, lagging all explanatory variables by one year lessens concern about possible simultaneity bias.

1 The output gap would have been the best indicator to control for the impact of business cycle fluctuations. However, data on this variable are available for industrial countries only.

We employ both country and year fixed effects. Country effects are included to control for the impact of unobserved country-specific characteristics such as cultural norms concerning participation in the labor-force by women. Year effects are included to control for the impact of shocks that are common across countries (e.g., oil price shocks).

5 Results

Tables 5.1 and 5.2 present our main findings. In each table, column 1 reports the results from our baseline regression while columns 2 to 6 report the results from our robustness checks. The coefficient on economic freedom is statistically significant in most cases. According to our estimates, more economic freedom is likely to reduce unemployment both among the total labor force and among young people.

The effects of economic freedom appear to be substantial. For example, take Denmark. On the 0-to-10 scale, its chain-linked EFW summary rating increased from 6.5 in 1980 to 7.8 in 2007. Over the same period, the performance of the Danish labor market also improved markedly, according to both of our dependent variables. Our estimates suggest that Denmark's increase in economic freedom might have caused a fall in its unemployment rate over this period of between 1.0 and 1.3 percentage points, *ceteris paribus*. They also suggest that it might have contributed to a drop in its youth unemployment rate of between 1.9 and 2.5 percentage points, *ceteris paribus*.

Comparing two countries also suggests that differences in economic freedom might have substantial effects on unemployment. Take the United States and Italy, for example. The United States achieved one of the best results. On average over the 17 years for which data are available, its chain-linked EFW summary rating was 8.1. Italy's rating, at 6.5, was noticeably lower. Italy also had a much higher unemployment rate and a much higher youth unemployment rate. On average over the years 1980 to 2007, its unemployment rate was 10.0% and its youth unemployment rate was 29.5%. The corresponding figures for the United States were 6.1% and 12.4%, respectively. According to our estimates, if Italy had enjoyed the same degree of economic freedom as the United States, its unemployment rate might have been between 1.2 and 1.6 percentage points lower, *ceteris paribus*. Furthermore, its youth unemployment rate might have been between 2.3 and 3.0 percentage points lower, *ceteris paribus*. These figures (as the ones in the previous paragraph) are based on the smallest and the largest statistically significant coefficient on economic freedom from the regressions presented in tables 5.1 and 5.2, respectively. Of course, they should be taken with a grain of salt. Still, they illustrate that the magnitude of the effects is likely to have been substantial.

The regressions presented in tables 5.1 and 5.2 estimate only the direct impact of economic freedom on unemployment. Specifically, the coefficients on economic freedom are based on the assumption that the GDP growth rate is constant. This ignores the fact that, according to previous research, economic freedom also exerts a favorable impact on economic growth (for example, Feldmann, 2005). Therefore, economic freedom is likely also to indirectly reduce unemployment by increasing growth.

Table 5.3 presents regressions to estimate both the direct and the indirect effect. Regressions 1 to 3 use our baseline specification. To check the robustness of the results from these regressions, regressions 4 to 6 additionally include the inflation-rate variable. We use this variable because, in our main regressions, it is the only additional control that is statistically significant in both the regression to explain the unemployment rate and in the regression to explain the youth unemployment rate (tables 5.1 and 5.2).

To analyze the indirect impact of economic freedom, we first estimate its impact on the GDP growth rate and then substitute the residuals from this regression for the GDP growth rate variable in our regressions to explain the unemployment and the youth unemployment rate. The logic of doing this is that the residuals from the growth regressions represent the variation that is not correlated with economic freedom; by using these residuals, the variation in growth that is associated with differences in economic freedom is captured in the coefficient on economic freedom. Thus this coefficient reflects the direct impact as well as the indirect impact via economic growth.

In line with previous research, regressions 1 and 4 indicate that economic freedom has a positive impact on growth (table 5.3). Using the residuals from these regressions, we find that the absolute values of the coefficients on economic freedom are noticeably larger than those from the respective main regressions.[2] Specifically, in the regressions to explain the unemployment rate the absolute value increases from 8.03 to 10.35 using the baseline specification and from 8.83 to 10.35 when additionally

2 The level of statistical significance is higher as well.

Table 5.1: Regressions to explain the unemployment rate

	Baseline specification	GDP growth gap substituted for GDP growth rate	Population aged 65 & above added	Political rights & civil liberties added	Real interest rate added	Inflation rate added
	(1)	(2)	(3)	(4)	(5)	(6)
Economic freedom	−8.03*	−9.69*	−7.60*	−9.21*	−7.20	−8.83*
	(4.47)	(5.03)	(4.38)	(4.82)	(5.36)	(4.52)
GDP growth rate	−0.26***		−0.25***	−0.25***	−0.25***	−0.27***
	(0.04)		(0.04)	(0.04)	(0.06)	(0.05)
GDP per capita	−0.18*	−0.18*	−0.19*	−0.18*	−0.21*	−0.18*
	(0.10)	(0.10)	(0.10)	(0.10)	(0.12)	(0.10)
Population aged 0–14	19.55	25.09	25.46	19.25	21.54	18.26
	(16.73)	(18.28)	(16.81)	(16.14)	(17.46)	(17.55)
War	−0.73	−0.31	−0.82	−0.75	0.54	0.02
	(2.20)	(2.12)	(2.18)	(2.20)	(2.45)	(2.12)
GDP growth gap		−0.11				
		(0.07)				
Population aged 65 & above			30.58			
			(23.02)			
Political rights & civil liberties				2.09		
				(1.77)		
Real interest rate					4.55	
					(2.77)	
Inflation rate						−0.10***
						(0.03)
Number of observations	678	679	678	678	576	668
Number of countries	89	89	89	89	79	88
R^2 (within)	0.28	0.23	0.29	0.29	0.34	0.29
F-statistic	8.56***	5.97***	8.06***	7.89***	8.97***	8.95***
Standard error of regression	2.02	2.09	2.01	2.01	1.98	1.99

Notes: Pooled least-squares estimates with country-specific and year-specific fixed effects. All regressions are based on data for the years 1980, 1981, 1985, 1986, 1990, 1991, 1995, 1996 and 2000 to 2008. All explanatory variables are lagged by one year. Robust standard errors, adjusted for clusters at the country level, are reported in parentheses. Results marked ***, **, or * are statistically significant at the 1%, 5%, or 10% level.

Table 5.2: Regressions to explain the youth unemployment rate

	Baseline specification	GDP growth gap substituted for GDP growth rate	Population aged 65 & above added	Political rights & civil liberties added	Real interest rate added	Inflation rate added
	(1)	(2)	(3)	(4)	(5)	(6)
Economic freedom	−14.41	−17.96*	−15.16*	−15.10*	−14.26*	−18.94**
	(8.85)	(9.64)	(9.09)	(8.89)	(8.38)	(9.36)
GDP growth rate	−0.44***		−0.45***	−0.43***	−0.42***	−0.48***
	(0.08)		(0.08)	(0.08)	(0.10)	(0.08)
GDP per capita	−0.29	−0.32	−0.29	−0.29	−0.47**	−0.28
	(0.22)	(0.22)	(0.23)	(0.22)	(0.20)	(0.23)
Population aged 0–14	26.58	33.79	20.99	29.83	23.37	23.92
	(33.25)	(34.14)	(36.89)	(32.54)	(33.27)	(34.32)
War	−0.94	−0.28	−0.93	−0.93	−0.38	0.69
	(1.57)	(1.48)	(1.59)	(1.55)	(1.70)	(1.50)
GDP growth gap		−0.14				
		(0.10)				
Population aged 65 & above			−22.21			
			(48.56)			
Political rights & civil liberties				4.14		
				(3.67)		
Real interest rate					5.48*	
					(2.76)	
Inflation rate						−0.24**
						(0.09)
Number of observations	637	638	637	637	544	627
Number of countries	92	92	92	92	86	90
R^2 (within)	0.20	0.15	0.20	0.20	0.27	0.22
F-statistic	7.88***	4.90***	7.37***	7.43***	6.30***	6.88***
Standard error of regression	3.74	3.86	3.74	3.73	3.50	3.70

Notes: Pooled least-squares estimates with country-specific and year-specific fixed effects. All regressions are based on data for the years 1980, 1981, 1985, 1986, 1990, 1991, 1995, 1996 and 2000 to 2008. All explanatory variables are lagged by one year. Robust standard errors, adjusted for clusters at the country level, are reported in parentheses. Results marked ***, **, or * are statistically significant at the 1%, 5%, or 10% level.

Table 5.3: Regressions to estimate both direct and indirect effects

Specification	Baseline			Inflation rate added		
Dependent variable	GDP growth rate	Unemployment rate	Youth unemployment rate	GDP growth rate	Unemployment rate	Youth unemployment rate
	(1)	(2)	(3)	(4)	(5)	(6)
Economic freedom	9.43**	−10.35**	−21.68**	8.27**	−10.35**	−24.42**
	(3.59)	(4.80)	(8.91)	(3.54)	(4.86)	(9.75)
Residuals from GDP growth rate regression		−0.17***	−0.45***		−0.17***	−0.45***
		(0.06)	(0.11)		(0.06)	(0.11)
GDP per capita	−0.17***	−0.19**	−0.33	−0.15***	−0.19*	−0.33
	(0.05)	(0.09)	(0.21)	(0.05)	(0.10)	(0.21)
Population aged 0–14	6.89	25.52	30.36	5.66	25.89	30.86
	(7.12)	(16.45)	(30.85)	(8.00)	(17.00)	(31.52)
War	−0.74	0.08	−0.28	−0.70	0.64	0.92
	(0.85)	(2.09)	(1.56)	(0.90)	(2.11)	(1.63)
Inflation rate				−0.02	−0.07**	−0.16**
				(0.02)	(0.03)	(0.07)
Number of observations	1130	680	639	1087	670	629
Number of countries	100	89	92	100	88	90
R^2 (within)	0.14	0.25	0.19	0.14	0.26	0.20
F-statistic	8.03***	6.31***	4.96***	9.47***	6.48***	4.68***
Standard error of regression	3.14	2.06	3.76	2.87	2.05	3.74

Notes: Pooled least-squares estimates with country-specific and year-specific fixed effects. All regressions are based on data for the years 1980, 1981, 1985, 1986, 1990, 1991, 1995, 1996 and 2000 to 2008. All explanatory variables are lagged by one year. While regressions 2 and 3 use the residuals from regression 1, regressions 5 and 6 use the residuals from regression 4. Robust standard errors, adjusted for clusters at the country level, are reported in parentheses. Results marked ***, **, or * are statistically significant at the 1%, 5%, or 10% level.

including the inflation rate variable (regressions 1 and 6 in table 5.1, regressions 2 and 5 in table 5.3). The increase is even larger in the regressions to explain the youth unemployment rate. Here the absolute value of the coefficient on economic freedom rises from 14.41 to 21.68 using the baseline specification and from 18.94 to 24.42 when additionally including the inflation rate variable (regressions 1 and 6 in table 5.2, regressions 3 and 6 in table 5.3).

To illustrate the magnitude of the effects, let us again compare the United States and Italy. According to our regressions estimating both the direct and the indirect effect, if Italy had enjoyed the same degree of economic freedom as the United States, its unemployment rate might have been 1.7 percentage points lower among the total labor force and between 3.5 and 3.9 percentage points lower among youth, *ceteris paribus*. Thus the direct and the indirect effect combined are likely to be noticeably larger than the direct impact alone, especially among young people.

Finally, let us briefly comment on our estimates for the control variables (tables 5.1 to 5.3):

- A higher GDP growth rate has a favorable impact on unemployment, indicating that workers benefit from economic growth. The effect on young people is particularly large.

- Higher GDP per capita is correlated with a lower unemployment rate, suggesting that richer countries may be better able to integrate workers into the job market. Higher GDP per capita is also correlated with a lower youth unemployment rate, although this result is statistically significant in one regression only.

- A higher real interest rate is associated with a higher youth unemployment rate, indicating that it may reduce demand for young workers.

- A higher inflation rate is associated with both a lower unemployment rate and a lower youth unemployment rate, suggesting that it may facilitate the adjustment to shocks by lowering real wages.

6 Conclusion

According to our regression results, more economic freedom appears to reduce unemployment. The magnitude of the effect seems to be substantial, especially among young people. Given the substantial costs of unemployment and the enormous number of jobless people worldwide, particularly in the wake of the current financial and economic crisis, governments should consider increasing economic freedom as a means of reducing unemployment.

Appendix A: List of countries

Albania	Colombia	Hong Kong	Malawi	Peru	Switzerland
Algeria	Costa Rica	Hungary	Malaysia	Philippines	Syria
Argentina	Croatia	Iceland	Mali	Poland	Tanzania
Australia	Czech Republic	India	Mauritius	Portugal	Thailand
Austria	Denmark	Indonesia	Mexico	Romania	Trinidad & Tobago
Azerbaijan	Dominican Rep.	Iran	Morocco	Russia	Tunisia
Bangladesh	Ecuador	Ireland	Namibia	Rwanda	Turkey
Belgium	Egypt	Israel	Nepal	Senegal	Uganda
Benin	El Salvador	Italy	Netherlands	Sierra Leone	Ukraine
Bolivia	Estonia	Jamaica	New Zealand	Singapore	United Kingdom
Botswana	Fiji	Japan	Nicaragua	Slovakia	United States
Brazil	Finland	Jordan	Niger	Slovenia	Uruguay
Bulgaria	France	Latvia	Nigeria	South Africa	Venezuela
Cameroon	Georgia	Lithuania	Norway	South Korea	Vietnam
Canada	Germany	Luxembourg	Pakistan	Spain	Zambia
Chile	Greece	Macedonia	Panama	Sri Lanka	
China	Honduras	Madagascar	Paraguay	Sweden	

Appendix B: Definitions and sources of variables

Economic freedom Chain-linked summary index from *Economic Freedom of the World*, scaled to take values between 0 (least free) and 1 (most free). The index measures the degree of economic freedom in the following areas: (1) Size of government: expenditures, taxes and enterprises, (2) Legal structure and security of property rights, (3) Access to sound money (4) Freedom to trade internationally, (5) Regulation of credit, labor, and business. The summary ratings of the index are the arithmetic means of the five area ratings.

Source Gwartney and Lawson, 2009.

GDP growth gap Annual percentage growth rate of real GDP minus its trend growth rate. Trend growth rate of real GDP calculated using the Hodrick-Prescott filter ($\lambda = 6.25$).
Source World Bank, 2009; author's calculations.

GDP growth rate Annual percentage growth rate of real GDP.
Source World Bank, 2009.

GDP per capita Gross domestic product per capita, in thousands of constant 2005 international dollars, converted at purchasing power parity rates.
Source World Bank, 2009.

Inflation rate Annual change in the consumer price index; decimal fraction.
Source World Bank, 2009.

Political rights & civil liberties Average of political rights and civil liberties ratings. Political rights include the right to form political parties, to compete for public office and to elect representatives who have a decisive vote on public policies. Civil liberties include religious, ethnic, economic, linguistic, gender and family rights, personal freedoms, and freedom of the press, belief, and association. The index, which is based on surveys among analysts and academics, is scaled to range from 0 to 1, with higher values representing more political rights and civil liberties (or more respect for or more protection of political rights and civil liberties).
Source Freedom House (various issues); author's calculations.

Population aged 0–14 The share of the total population that is in the age group 0 to 14 years.
Source World Bank, 2009.

Population aged 65 and above The share of the total population that is 65 years or older.
Source World Bank, 2009.

Real interest rate The lending interest rate adjusted for inflation as measured by the GDP deflator; decimal fraction.
Source World Bank, 2009.

Unemployment rate Unemployed as a percentage of the labor force. Labor force survey data.
Source European Commission, 2009; International Labour Office, 2009; OECD, 2010.

War Dummy variable that takes the value 1 if, in the respective year, there was a war on the country's territory. There are three types of war: a war between two or more states, an internal war (with or without the intervention from other states), and a war between a state and a non-state group outside its own territory.
Source Centre for the Study of Civil Wars, 2009.

Youth unemployment rate Unemployed aged 15 to 24 years as a percentage of the labor force in the same age bracket. Labor force survey data.
Source European Commission, 2009; International Labour Office, 2009; OECD, 2010.

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