

The global crisis

Causes, responses and challenges

WAGES AND ECONOMIC CRISIS: TOWARDS A NEW PERSPECTIVE ON WAGES, PRODUCTIVITY AND ECONOMIC GROWTH

11

*Patrick Belser and Sangheon Lee**

11.1 INTRODUCTION

With the dominance of neoclassical thinking in economics and economic policies, the macroeconomic function of wages tends to be considered only partially and, as a result, wage moderation is seen as beneficial to economic growth. However, the recent global financial and economic crisis offers the painful lesson, among many others, that sluggish wage growth constrains economic growth by suppressing growth in consumption demand. This constraint has been overcome in some countries either through debt-financed consumption or through accelerating exports, which in turn exacerbate global imbalances.

These developments indicate that policy decisions at national, regional and international levels should be based on a sound understanding of the macroeconomic effects of wages on aggregate demand and labour productivity as well as labour costs. Indeed, a growing number of economists have recently spoken out on the possibility that wage moderation and growing wage inequality in advanced countries may have been part of the structural roots of the crisis. For instance, Fitoussi and Stiglitz (2009) now consider that “the aggregate demand deficiency preceded the crisis and was due to structural changes in income distribution” (p. 3). Because the propensity to consume among low income households is higher, the general surge of inequalities in favour of high incomes “would

* The authors are Wage Specialist and Senior Economist, Conditions of Work and Employment Programme, ILO, Geneva, respectively.

have had the macroeconomic effect of depressing aggregate demand.” (p. 4) (See also Rajan, 2010; Reich, 2010.)

However, these increasing concerns about the macroeconomic dynamics of wages have not been accompanied by comparable research efforts, so that there is a risk that the global debates on wages will be reduced back to the familiar rhetoric games. In light of these research demands, this chapter is intended to outline the key issues for research and how they can be addressed. In order to contextualize these research questions, we will first review the overall trends in wages, with a strong focus on the period of the global economic crisis. This brief review will confirm that sluggish growth in wages with widening inequality is a global phenomenon. The chapter will then discuss major aspects of the relationship between wages and economic growth and highlight research gaps in terms of concepts, theories and empirical evidence. In light of common confusion over the term “wage-led”, we will attempt to clarify this concept in terms of aggregate demand, economy and policies. The chapter will conclude by emphasizing the need for more research work with a view to developing a better understanding of the relationship between wages, productivity and economic development.

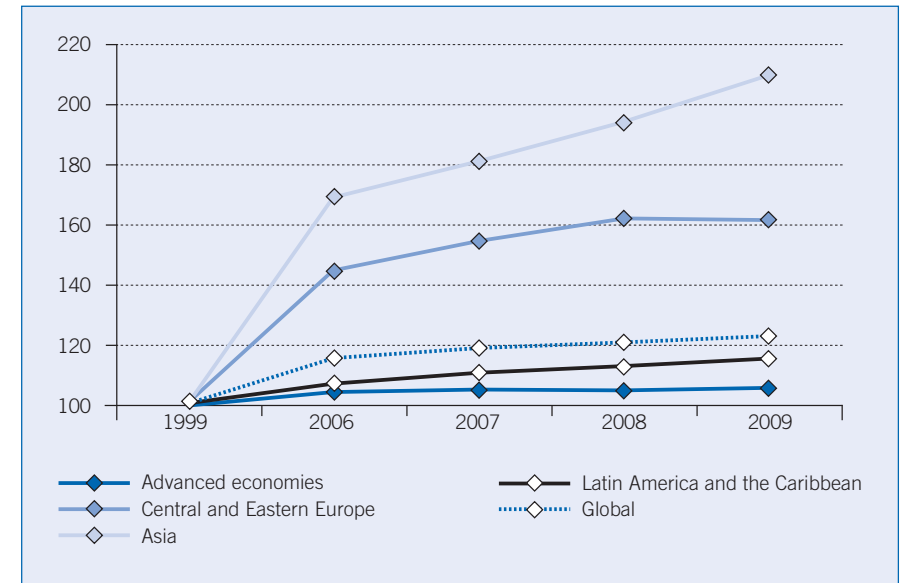
11.2 WAGES AND ECONOMIC CRISIS: A GLOBAL OVERVIEW¹

11.2.1 Average wage growth

Based on complete and incomplete wage data for 115 out of a universe of 177 countries and territories in the ILO Global Wage Database, figure 11.1 looks at how average wages have evolved over the full decade of the 2000s (taking 1999 as the base year). We see that global average wages increased by almost one-quarter over this period. This increase was driven by developing regions such as Asia, where wages have more than doubled since 1999, or countries in Eastern Europe and Central Asia where wages more than tripled (which partly reflects the depth of the wage decline in the 1990s). By comparison, real wages grew only modestly in Latin America and the Caribbean, in Africa and in the Middle East. In advanced economies, real wages increased by only about 5 per cent in real terms over the whole decade, reflecting a period of wage moderation.

¹ This section is drawn from *Global Wage Report 2010/11: Wage policies in times of crisis* (ILO, 2010d) which is an outcome of collective work by a number of ILO researchers including Malte Luebker, Kristen Sobeck and Manuela Tomei as well as the authors of this chapter.

Figure 11.1 Cumulative wage growth, by region, 1999–2009 (1999 = 100)

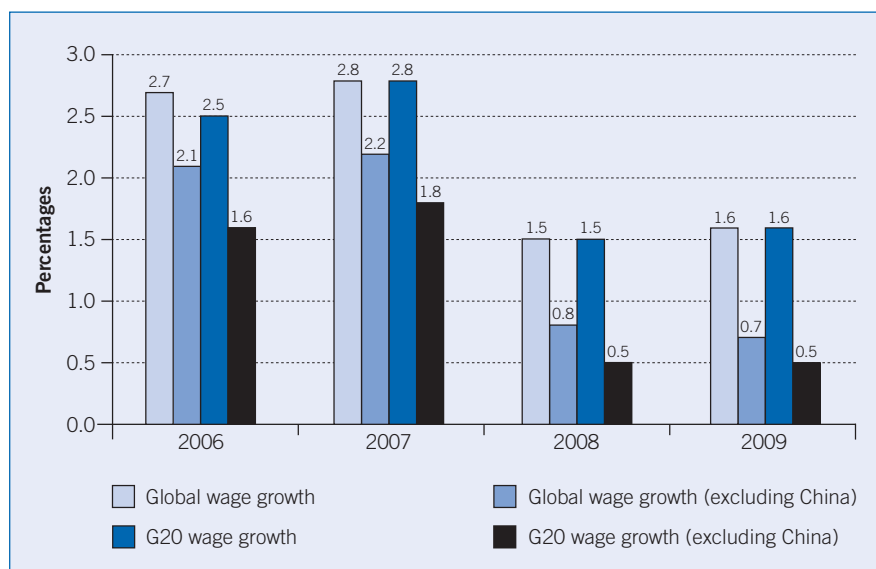


Note: For coverage and methodology, see ILO (2010d, Technical appendix 1).

Source: ILO Global Wage Database, <http://www.ilo.org/travail>.

How did the global crisis affect average wages? Figure 11.2 shows that the crisis cut the global wage growth by half, representing a loss of perhaps around US\$800 billion for the world's 1.5 billion or so employees. We see that, globally, real monthly wages grew at 2.7 and 2.8 per cent in the two years before the crisis (2006 and 2007) and that the crisis cut this growth rate to 1.5 and 1.6 per cent in 2008 and 2009. Restricting our sample to the G20 countries, which account for about 70 per cent of the world's wage earners (and an even larger fraction of the world's wage bill), we find very similar results. We estimate that the G20 average wage grew by 2.5 per cent in 2006, 2.8 per cent in 2007, 1.5 per cent in 2008 and 1.7 per cent in 2009. This highlights the fact that our global estimate – which is a weighted average – is highly dependent on the reliability of official wage statistics from large G20 countries. Figure 11.2 also illustrates the importance of China's wages in determining the global wage growth. During the period of 2008 and 2009, the global wage growth, if China is excluded, would have been further reduced to 0.8 per cent and 0.7 per cent respectively. In other words, China accounted for almost half of the global wage growth during the turbulent years of global crisis.

Figure 11.2 Wages, economic crisis and “China factor”: Average global wage growth, 2006–2009 (percentages, year-on-year changes, real terms)



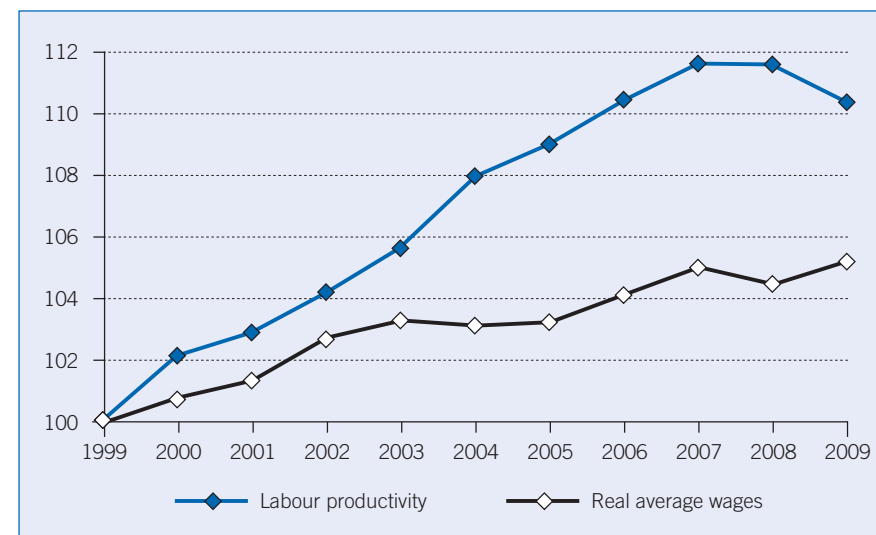
Note: The global wage growth is calculated as a weighted average of actual or estimated year-on-year growth in real average monthly wages in 113 countries, covering 94 per cent of all employees in the world (see description of the methodology in ILO (2010d, Technical appendix I).

Source: ILO Global Wage Database.

11.2.2 Wages and productivity in advanced economies

How did recent wage trends relate to changes in labour productivity? This question is important since growing labour productivity – producing more output with the same input of labour – has historically been one of the most powerful driving forces behind rising living standards and increases of real wages. In particular, labour productivity is often a key factor in wage determination and is widely used by the social partners as a reference point in collective bargaining. While there are a number of different ways to measure labour productivity, they all define economic output in relation to labour input. In line with the United Nation’s Millennium Development Goals (MDGs), we use GDP per person employed as a simple measure of labour productivity. While more refined approaches that adjust for hours worked are often useful for single-country studies, this simple measure keeps the data requirements to a minimum and allows us to cover a large number of countries.

Figure 11.3 Advanced economies: Cumulative wage and productivity growth, 1999–2009 (1999 = 100)



Source: ILO Global Wage Database; ILO Key Indicators of the Labour Market Database (KILM).

Taking the long-term view, and looking at figure 11.3, we see that while average wages in advanced economies grew by 5.2 per cent over the entire decade (level in 2009, as compared to 1999), labour productivity grew by 10.3 per cent over the same period and thus almost twice as fast as wages. The divergence between wages and productivity finds its main cause in low wage growth during the pre-crisis period. Despite robust economic growth and annual gains in labour productivity between 1.0 and 2.1 per cent during the years from 2002 to 2007, annual wage growth in advanced economies was less than one per cent during that boom period. This long-run deviation has led to a decoupling of wage growth from productivity growth in advanced economies. Since the figures refer to a weighted average, developments in the three largest advanced economies (Germany, Japan and United States) have a particular impact on this outcome.

11.2.3 The “wage share” in advanced economies²

What are the consequences of these trends on the “wage share”? Most frequently, the “unadjusted” wage share is defined as the ratio of the

² This section draws on the contributions of Rebecca Freeman and Jean-Michel Pasteels prepared for ILO (2010d).

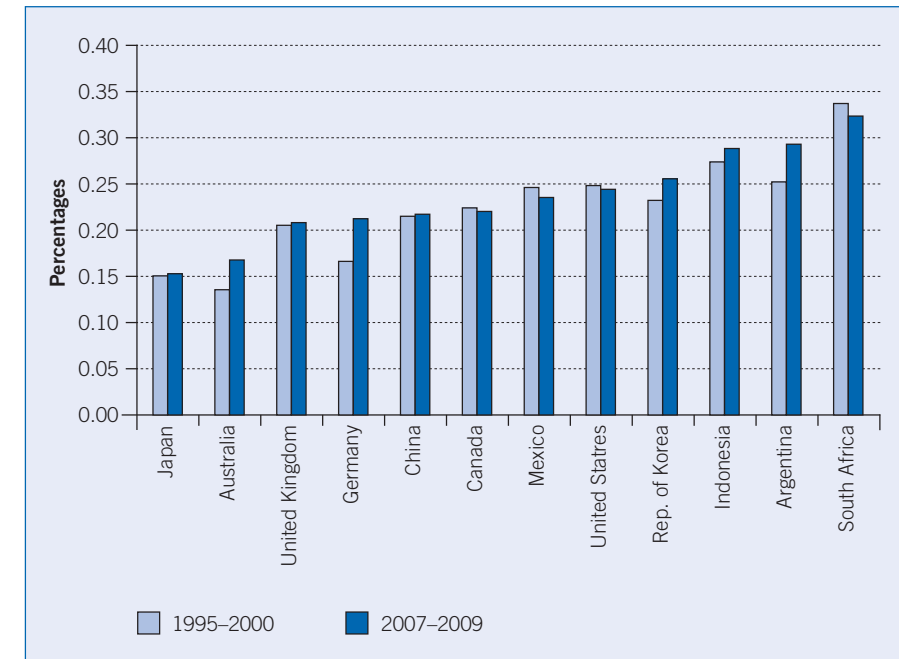
total compensation of employees to gross value-added, both measured in nominal terms, which can be calculated from national accounts. By highlighting the amount of income accruing to paid labour, the wage share can shed light on various issues of interest, including the extent to which economic growth translates into higher incomes for workers. However, while the concept of the wage share may appear to be straightforward, there is much debate on the implications of this “crude” measure (see Lübker, 2007 for details). In particular, standard measures of employee compensation in national accounts (i.e. wages plus salaries and social contributions paid by the employer) omit the labour income of the self-employed. As such, the “unadjusted” wage share ignores the labour income of proprietors of their own businesses. In countries or sectors where there is a high proportion of self-employment in total employment, the exclusion of self-employed workers can cause a significant underestimation of the actual share of national income which rewards workers.

We examine the “wage share” by sector among OECD member countries, using the OECD Database for Structural Analysis (www.oecd.org/sti/stan) and the OECD System of National Accounts (www.oecd.org/std/ana). The analysis reveals that there was a predominantly negative long-term trend in the “real economy” wage share (i.e. leaving out financial intermediation, real estate, renting and other business services) in a majority of countries with available data. Overall, for the period 1980–2007, 17 out of 24 countries with available data registered a falling wage share, although there was substantial cross-country variation. This overall decline can also be observed at the level of individual sectors, including labour-intensive sectors such as manufacturing or construction. In manufacturing, for example, the long-term trend in the wage share has been negative for 26 out of 29 countries. In construction, the negative trend has been much less obvious – but was nevertheless observed in 17 out of 30 countries. Analysis of such sectoral data through a so-called “shift-share” calculation dismisses the hypothesis that the wage share has been going down in OECD countries mostly because of structural change of economies moving towards more capital-intensive sectors. On the contrary, these calculations show that the bulk of the downward trend in the wage share is due to falling wage shares within sectors.

11.2.4 Wage inequality

Although the focus on aggregate measures such as average wages or the wage share is informative, these measures do not provide any evidence on the distribution of wages among different classes of wage earners. To understand who benefited most from productivity gains, a number of

Figure 11.4 Share of low-pay employment in total employment, selected G20 countries, 1995–2000 and 2007–2009



Source: ILO Global Wage Database.

indicators can be used: the Gini index for wage distribution, the gender wage gap, the ratio of top-to-bottom 10 per cent of wages, or the share of low-paid workers whose hourly wages represent less than two-thirds of median wages. Whatever indicator is used it appears that a majority of countries experienced increases in inequality over the last ten to 15 years – the only exception being inequality between men and women. Indeed, evidence shows that in 80 per cent of countries with available data the female wage ratio (the ratio of female average wages to male average wages) has narrowed (ILO, 2010d). This decline has usually been slow when compared to women’s recent educational achievements and the closing of the gender gap in work experience.

Other indicators all point towards more inequality in a majority of countries. The *ILO Global Wage Report 2008/09* (ILO, 2008) calculated, for example, that the wage gap between those in the top 10 per cent and those in the bottom 10 per cent of the wage distribution increased in 23 out of 31 countries with available data between 1995 and 1997 and between 2004 and 2006. The subsequent edition of the report (ILO, 2010d) showed

that the proportion of people on low pay also increased in 25 out of 37 countries with data available – again indicating an increase in inequality in about two-thirds of countries. Figure 11.4 illustrates recent changes in G20 countries for which data are available. Case studies show that women, low-skilled workers, young people and migrant workers are most likely to be affected by low pay. The type of enterprises and employment characteristics are also significant, with higher risk of low pay for workers in small enterprises and on short-term contracts. In recent years, these people have all faced an increased risk of falling behind the median worker.

11.3 A NEW PERSPECTIVE ON WAGES, PRODUCTIVITY AND ECONOMIC GROWTH: THE POTENTIAL OF “WAGE-LED” GROWTH³

The global trends in wages in the 2000s, which can be characterized by wage moderation and growing inequality, are now widely believed to have had grave economic consequences. Not surprisingly, the need for a better and more balanced understanding of the “macroeconomics of wages” is high. In this regard, the post-Keynesian approach to wages, especially through the concept of “wage-led growth”, has attracted much interest from both academics and policy-makers. Similar concepts, such as “income-led” growth, have also been used in policy debates. However, to advance the debate, a conceptual elaboration of the “macroeconomics of wages” needs to be thoroughly developed and presented in a systematic way for the consideration of policy-makers, especially in developing countries which are caught in the neoclassical policy doctrine that wage moderation is the key to economic success. In this regard, it is particularly important to revisit the existing theories and empirical evidence concerning “wage-led growth” and develop the policy implications for the labour market and the economy, considering different circumstances across countries.

11.3.1 What does “wage-led” mean?: Conceptual clarifications

There appears to be confusion, at least among policy-makers, over what is meant by “wage-led”. Unfortunately, it is often understood to mean unconditional support for high wages and is categorically denounced.

³ This section benefits from inputs and comments from the members of the research project on “New Perspectives on Wages and Economic Growth”: E. Hein, M. Lavoie, R. Naastepad, O. Onaran, E. Stockhammer, S. Storm, S. Sturn and T. van Treeck.

Unless these misunderstandings are properly addressed, meaningful policy debates will be difficult.

In the academic debate the most widely used term is that of “wage-led” *demand*. In the standard macro model, the aggregate demand (y) is defined as the sum of consumption (c), investment (i) and net export (nx). Wages (w) are known to affect all three components. Thus,

$$y = f(w) = g(c(w), i(w), nx(w))$$

Aggregate demand is wage-led if an increase in the wage share leads, other things equal, to an increase in aggregate demand, with the supply side of the economy assumed given:

$$\Delta y / \Delta w = \Delta c / \Delta w + \Delta i / \Delta w + \Delta nx / \Delta w > 0$$

This is based on the theoretical work of Bhaduri and Marglin (1990) and Blecker (1989), who established that the nature of the demand regime is not a priori defined. Demand in actual economies could be either wage-led or profit-led, because consumption is usually thought of as being wage-led while investment and net exports are expected to be profit-led ($w \uparrow \rightarrow c \uparrow, i \downarrow, nx \downarrow$). (Private) aggregate demand is the sum of consumption, investment and net exports and the total (or net) effect is thus ambiguous. This has recently given rise to a rich empirical literature trying to identify demand regimes by econometric means (Bowles and Boyer, 1995; Onaran and Stockhammer, 2005; Naastepad and Storm, 2006–7; Hein and Vogel, 2008; Stockhammer et al., 2009). It should be noted that the analysis of the demand regime takes supply conditions as given and is thus (for purposes of economic policy) restricted to a short time horizon.

Wage-led *growth* is a stronger and more long-term concept than wage-led demand as it incorporates the supply-side effects of changes in wages. The concept is stronger because it requires that the growth of the capital stock is also wage-led. The concept is also concerned with a longer time frame, because several of the variables that are usually considered given in the short run have to be regarded as endogenous in the context of growth theory. For wage-led growth to occur it is crucial that investment is wage-led in the medium term (note that demand can be wage-led even if investment is profit-led if consumption is sufficiently strongly wage-led). There are two important channels that explain why investment could be wage-led. First, if demand is strongly wage-led then investment can be pulled along by wage-led demand via the standard accelerator effect in the investment function ($w \uparrow \rightarrow c \uparrow > i \downarrow$ [partial effect with given y] $\rightarrow y \uparrow \rightarrow i \uparrow$ [total effect]). Second, if productivity is wage-led (which it is likely to be) and investment reacts to productivity growth, then

investment can be pulled along via the link ($w \uparrow \rightarrow$ productivity $\uparrow \rightarrow i \uparrow$). These channels will be discussed later in this chapter (section 11.3.5).

For *economic policy* purposes wage-led growth should be the key concept. It basically describes a virtuous circle where wage growth leads to higher demand and higher productivity growth and, as a consequence, to higher investment. The concept of wage-led growth is important because of the failure of neoliberalism to deliver a growth regime that is equitable, stable and sustainable. In this respect, wage-led growth can be contrasted with two growth regimes which have emerged: “finance-led growth” (also called credit-led growth), where growth was fuelled by increasing household debt made possible by asset and property price bubbles and financial engineering (for example in Ireland, the United Kingdom and the United States); and “export-led growth”, where the main engine of growth has been net exports (as in China, Germany, Japan and Republic of Korea). Both of these neoliberal growth regimes have come with wage suppression (and often with wage polarization) (Stockhammer, 2009; van Treeck, 2010; Hein, 2010; UNCTAD, 2010c). Simply put, stagnant demand from stagnating wages was substituted by demand fuelled by credit in the finance-led regime and by external demand in the export-led regime. A wage-led growth model aims at restoring wage growth and argues that this is consistent with long-term growth.

11.3.2 Wage-led growth as an economic policy strategy

Wage-led demand and wage-led growth point to the hard reality of economic structure where the size of the wage share plays a significant role in determining economic growth (irrespective of the types of the policies and institutions “imposed” on the economy). Note that neither wage-led demand nor wage-led growth require wages (or the wage share) to increase. It is therefore important to distinguish between changes in income distribution (or distributional policy) and the nature of the demand and the growth regime. Indeed, empirical studies (for example Naastepad and Storm, 2007) suggest that many OECD countries are “wage-led economies”, but wage shares have fallen throughout OECD countries.

In order to establish a wage-led growth process, therefore, economic policy will have to address issues of income distribution as well as economic structure. As illustrated in table 11.1, all four combinations – wage-led and profit-led growth demand regimes and “active” and “passive” distributional policies – are possible, but not all are equally consistent. In a wage-led economy, active distribution policies will result in a growth process, but passive policies will result in stagnation

(or instability). Conversely, in a profit-led economy active distribution policies will lead to stagnation and passive policies will lead to a profit-led growth process. This latter scenario is essentially the trickle-down argument that neoliberal economists have been making.

Table 11.1 Possible conceptual framework for assessing distribution policies

| Economic regime | Distribution policies | |
|-----------------|---------------------------------|---------------------------------|
| | Active | Passive |
| Wage-led | Wage-led growth process | Stagnation (or unstable growth) |
| Profit-led | Stagnation (or unstable growth) | Profit-led growth process |

Source: Second author.

As an *economic policy strategy*, wage-led growth refers to an economic growth strategy where a range of policies is introduced to boost the wage share (such as redistributive policies, stronger minimum wages and more active use of collective bargaining), which results in higher consumption demand and higher productivity growth – which in turn lead to higher investment. As a consequence the productive capacity of the economy is also growing.⁴ In short, a *wage-led growth strategy* is the *coherent* growth strategy which applies an active distributional policy to a wage-led growth regime.

For clarification, the wage-led growth strategy as defined above should not be understood to imply that it is concerned only with the employed wage earners and thus fails to appreciate the importance of unemployment. The key concern in the framework of wage-led growth is the distribution of total income to capital and labour (that is, functional income distribution) and the key indicator is the wage share which can be expressed in its simplest form as follows:

Wage share = total wage compensation/total income = (average wages * total wage employment)/total income

It is clear that the wage share can be increased not only by increases in average wages but also by increases in wage employment. For instance, work sharing during economic downturn, which proved effective in maintaining wage share (that is, stagnating wages plus stable employment) in some countries such as Germany, can be seen as an important part of

⁴ The set of such policies can be extensive. For instance, it is argued that “redistributive, pro-worker interventions in the labour market need not to lead to higher (steady-inflation) unemployment if labour productivity is raised at the same time by proper fiscal, monetary, income and technological policies” (Storm and Naastepad, forthcoming).

the wage-led growth strategy. Therefore, the wage-led growth strategy is in a sense both “wage-led” and “employment-led”, effectively addressing both quantity and quality dimensions of employment. (However, it is, overall, focused on formal employment and research is needed to find ways of incorporating informal employment into the macroeconomic framework.)

11.3.3 *Is the wage-led economy a global norm?: Need for a global mapping*

With conceptual clarifications about wage-led growth, it is important to identify which countries belong to the “wage-led economy” and to come up with a rough global mapping that indicates the distribution of different types of economies around the globe. Most existing studies are limited in country coverage (mainly to OECD countries) with few exceptions (such as Onaran and Stockhammer, 2005) and little is known about developing countries such as Brazil, China and South Africa. In addition, the results of these empirical studies are sometimes sensitive to econometric methodologies.

As the issue of “wage-led” economy relates to economic structure, it is possible that an economy experiences a shift in economic regime: wage-led to profit-led, or vice versa. Research is rather scant on this issue. Earlier studies have pointed to the role of economic openness and globalization in converting wage-led to profit-led economies (for instance, Germany and Japan, as suggested by Bowles and Boyer, 1995).

Therefore, there is a need for global mapping from the perspective of wage-led growth (at least for G20 countries). One important issue underlying this mapping exercise is the proposition of “asymmetry”: while all countries can be wage-led economies simultaneously, all countries cannot be profit-led economies. Of course, this proposition is based on the assumption (or empirical fact) that a profit-led economy is likely to be export-oriented. Considering that this assumption may not hold for some countries (such as the United States), a weaker version of this proposition is that only a small group of countries can be profit-led. In other words, a wage-led rather than a profit-led economy is the global norm, and therefore this should be the basis for development policies in developing countries. This issue is related to ongoing debates on global rebalancing.

11.3.4 *Falling wage share: Causes and consequences*

There has already been a growing body of research which documents the declining trend of wage share and its causes (for ILO contributions, see

ILO, 2008 and 2010d; ILS, 2008). This trend is particularly puzzling, given that the wage share has also been falling in wage-led economies. This raises two interesting questions: determinants of wage share and the consequences of falling wage share.

First, concerning the determinants of wage share, the role of technological changes appears to have been misrepresented and overestimated (IMF, 2007d and 2007e; EC, 2007). This “conventional wisdom” has already been challenged by ILO (2008) and ILS (2008). More recently, Stockhammer (2009) checked the robustness of the earlier studies and found that their conclusions suffer econometric problems. In his econometric model, which corrected these problems, technological changes are no longer statistically significant. Interestingly, Stockhammer found that globalization (as measured by economic openness) and labour market institutions such as union density are the major determinants of the wage share. However, these studies are limited to OECD countries, and questions remain as to whether these findings can be extended to the global economy. Some pioneering studies which cover developing countries (ILO, 2008 and ILS, 2008) indicated the importance of globalization and labour market institutions, largely in line with Stockhammer (2009). Yet these conclusions are still tentative and further empirical evidence based on more rigorous statistical analysis is needed.

Second, the consequences of falling wage shares deserve serious attention as well, as they may give invaluable policy lessons. According to the simple conceptual framework in table 11.1, falling wage share (due to “passive” policies) in the wage-led economy may carry the risk of leading to lower growth and/or macroeconomic instability. Given the trend of growing inequality in income distribution before the “global crisis”, one crucial hypothesis is that such widening inequality, coupled with financialization, has been the key contributor to the crisis (Fitoussi and Stiglitz, 2009; Rajan, 2010; Reich, 2010). In fact, the critical importance of the linkage between income distribution and macroeconomic stability has already been recognized in the post-Keynesian literature (see Godley and Lavoie, 2007), and advances have been made in macroeconomic modelling and econometric studies (for example, Kumhof and Rancière, 2010; Horn et al., 2009; as well as ILO contributions such as Charpe et al., forthcoming; La Marca, 2010).

11.3.5 *Do high wages reduce or increase investment/productivity?: The linkage between wages, investment, and productivity*

One of the most familiar arguments against high wages is that they kill investment and cut productivity growth. This view is well established in

the conventional NAIRU (non-accelerating inflation rate of unemployment) approach which assumes a straightforward trade-off between high wages and low investment. However, this “conventional wisdom” can be questioned from the perspective of wage-led growth. Simply put, what is missing from this view is the macroeconomic benefits of high wages in terms of their impacts not only on consumption demands but also on investment and productivity. In fact, the productivity-enhancing effects of higher wages are well known at the workplace level as “efficiency wages” either in theories or empirical studies (such as Bewley, 1999). It will be interesting to see if this micro-level logic can be extended to the macroeconomic level. This constitutes a critical element of wage-led growth.

Evidence is already available. For instance, Storm and Naastepad (forthcoming) provide both theoretical and empirical cases for the macroeconomic version of efficiency wages. They identify three possible channelling mechanisms. Higher wages can lead to: (a) increasing capacity utilization; (b) increasing labour productivity through better use of production technologies or the deepening of division of labour; (3) promoting innovation and technological progress. However, higher wages as “beneficial constraints” for productivity growth do not seem to be automatically guaranteed. Rather, certain conditions must be met for the win-win outcome to materialize, and this is the issue which requires further research (*ibid.*).⁵

11.4 CONCLUSIONS

Considering the growing need for an alternative macroeconomic framework based on the lessons from the global crisis, this chapter has explored the potentials of wage-led growth and basically challenged the perception of “wage moderation” as a necessary condition for economic growth. The premise of the chapter is that the wage-led economy can create economic outcomes which are more stable and sustainable at both national and global levels. Particular attention has been paid to the issues which the model of wage-led growth needs to address in order for it to be recognized as a serious alternative model for policy-makers. In doing so, attempts have been made to provide a way of clarifying the meaning of “wage-led” in terms of aggregate demand, economy and policy strategy.

⁵ Importantly, in order to materialize this virtuous circle, favourable macroeconomic policies are needed, including the monetary policies which can address inflation pressures and the effective regulation of financial markets. The authors are grateful to Detlef Kotte for drawing our attention to it. See also Hein (2010).

Based on these conceptual clarifications, some common confusions over the concept of “wage-led” have been addressed. The chapter has also outlined key research questions, including the determinants and consequences of growing inequality in functional income distribution (such as wage share) and the macroeconomic dynamics which they may create, especially with a view to the developments leading to the global crisis.

It is hoped that more research efforts will be mobilized, especially within the ILO, to determine the possibility and conditions for wage-led growth as an alternative policy strategy. Such work will succeed only when reliable theoretical and empirical responses are provided to a number of key outstanding issues, some of which have been discussed in this chapter.