

Giovannoni, Olivier

**Working Paper**

## What do we know about the labor share and the profit share? Part II: Empirical studies

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## Working Paper No. 804

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### What Do We Know About the Labor Share and the Profit Share? Part II: Empirical Studies

by

**Olivier Giovannoni\***

**May 2014**

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\* Assistant professor, Department of Economics at Bard College; Research Scholar, Levy Economics Institute; member, University of Texas Inequality Project (UTIP), and corresponding author: <mailto:ogiovann@bard.edu>. All remaining errors are my sole responsibility. The author was assisted by Lei Lu, Dam Linh Nguyen and Alex Xu, who are undergraduate students at the Department of Economics, Bard College. Linh is also part of the Department of Applied Mathematics, Columbia University. Lei and Linh acknowledge financial assistance from the Bard Summer Research Institute.

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Levy Economics Institute  
P.O. Box 5000  
Annandale-on-Hudson, NY 12504-5000  
<http://www.levyinstitute.org>

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## **Abstract**

In this second part of our study we survey the rapidly expanding empirical literature on the determinants of the functional distribution of income. Three major strands emerge: technological change, international trade, and financialization. All contribute to the fluctuations of the labor share, and there is a significant amount of self-reinforcement among these factors. For the case of the United States, it seems that the factors listed above are by order of increasing importance. We conclude by noting that the falling US wage shares cointegrates with rising inequality and a rising top 1 percent income share. Thus, all measures of income distribution provide the same picture. Liberalization and financialization worsen economic inequality by raising top incomes, unless institutions are strongly redistributive.

The labor share has also fallen, for structural reasons and for reasons related to economic policy. Such explanations are left to parts III and IV of our study, respectively. Part I investigated the theories of income distribution.

**Keywords:** Wage Share; Labor Share; Profit Share; Technology; International Trade; Finance; Bargaining Power

**JEL Classifications:** D33, E24, E25

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## **1 TECHNOLOGY DID IT**

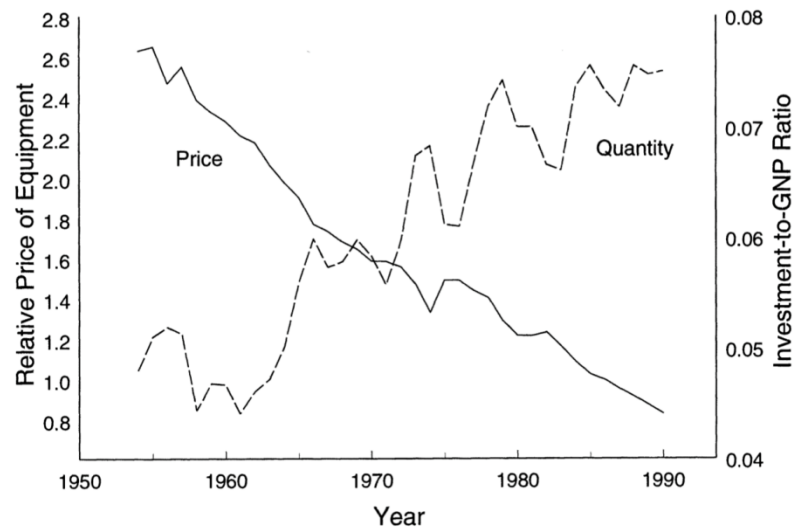
The decline of the labor share of income in many countries has led many researchers to turn to technological progress as an explanation (IMF, 2007a; Bentolila and Saint-Paul, 2003; Arpaia et al., 2009; Driver and Muñoz-Bugarin, 2010; Jones, 2003, Ellis and Smith, 2007; Hutchinson and Persyn, 2009). Specifically, economists draw attention to the ratio between capital and labor measured in efficiency units, which has been steadily increasing since the 1980s (Bental and Demougin, 2010). One of the most common explanations for this phenomenon is the emergence of capital-augmenting technical change (Jacobson and Occhino, 2012a,b; Berman et al., 1994; IMF 2007a).

The mechanism through which capital-augmenting technological change could affect the labor share is multifaceted. The recent shift away from labor-augmenting toward capital-augmenting technology –primarily due to major improvements in information and communication or ICT– largely increased the marginal productivity of labor. However this rise in marginal productivity has surpassed the growth in workers’ compensation over the last four decades (Giovannoni, 2013a,b). In effect, slower growth in labor income compared to the growth in total income has pushed the wage share downwards.

### **1.1 The Debate on the Nature of Technological Progress**

Whether recent technological advances are capital-augmenting, labor-augmenting, or Hicks-neutral change is at the core of the debate when one examines the role of technology in the evolution of the labor share. Greenwood et al. (1997) study the role of investment-specific technological change for economic growth in the U.S. and find that capital-embodied technological change is a key determinant of long-run productivity movements. Specifically, the remarkable decline of the relative price of equipment (see Figure 1) amidst a rising equipment-to-GNP ratio during 1950-1990 suggests that investment-specific technical change may be a contributing factor to economic growth.

Figure 1 Investment in Equipment



Source: Greenwood et al. (1997)

Greenwood et al. (1997) identify a negative correlation between equipment prices and equipment investment or GNP. This, in turn, indicates that investment-specific technologies may serve as a driving force behind economic fluctuations. According to the authors, approximately 60 percent of postwar productivity growth can be attributed to technological change. Karabarbounis and Neiman (2012, 2013) relate the lower labor share to the global decline of the cost of capital beginning around 1980, which induced firms to shift away from labor and toward capital. The greater investment is realized thanks to both the rise of corporate savings and the fall of interest rates. Thus, both studies justify the fall in the labor share as a market price phenomenon, where the lower capital price pushes the capital share up and consequently the wage share down.

But technological progress need not always be capital-biased (see Giovannoni 2013a). Dupuy and Marey (2004), and Catro and Coen-Pirani (2008), for instance, show that the production function has shifted in a non-neutral way over the last few decades, in large part due to the impact of technological change on the marginal rate of substitution. Dupuy (2006) investigates the dual nature of technological progress in the US using structural parameters allowing technical progress to be simultaneously both neutral and non-neutral, in the Hicksian sense. He finds that (1) both neutral and non-neutral technological changes occurred in the US in the period of 1948 to 1999, and (2) that three-fourths of the productivity slowdown observed in the 70s and 80s was due to the deceleration of non-neutral technical changes. Put differently,

Dupuy underlines that over the last few decades, technology has increasingly become less neutral. He also points out that the major investments in computer and information-processing equipment in the post–1973 period changed the marginal rate of substitution between factors of production and resulted in lower productivity.

In all, empirical evidence supports the assertion that technological change in the US is not purely neutral and points to the fact that the Solow residual may capture the effect of technological change on the marginal rate of substitution.

## **1.2 Capital-augmenting Technology and the Labor Share**

Several empirical studies support the claim that technological change became increasingly capital-augmenting rather than labor-augmenting (Jacobson and Occhino, 2012a,b; Berman et al., 1994; IMF 2007a). This hypothesis of capital-augmenting technological change in turn motivated a substantial number of empirical studies to investigate the relationship between technological change and the labor share (IMF 2007a; European Commission, 2007).

The IMF (2007a) World Economic Outlook finds that technological progress is the largest contributor to the fall in the aggregate labor share of income. In particular, this study examines to what extent the recent trend in labor shares in advanced economies may be explained by the changing global labor supply relative to other factors such as technological change and/or labor market reform.

On theoretical grounds, the reduction of barriers to cross-border trade and capital flows—combined with technological progress—has made it easier for firms to produce merchandise in foreign locations that exhibit lower costs of production. Due to offshore outsourcing, firms are able to boost their profits by lowering costs. Thus, because capital equipment and foreign workers are increasingly substituted for domestic workers, the wage income of domestic workers is likely to drop.

In order to find empirical evidence, the IMF uses a basic international trade model (Feenstra, 2003; Harrigan, 2000; and Kohli, 1991) to analyze the relationship between labor compensation and labor globalization. The model is then taken to the data with controls for technological progress and changes in labor market policies (but not financialization and not welfare retrenchment policies). This model is estimated on a panel of 18 advanced OECD economies over the period 1982–2002. The result shows that both the globalization of labor and technological progress contributed to the fall in the labor share. The IMF (2007a) concludes that

the effect of technological progress on the labor share is considerably large, while changes in labor market policies have a relatively smaller but positive impact on the labor share.

Empirical results in IMF (2007b) show that technological change reduced the labor share in both Anglo-Saxon and European countries, but less so in Anglo-Saxon countries. This may explain why the labor share in Anglo-Saxon countries are more stable than its continental Europe (Giovannoni 2013b). Of note, IMF (2007b) finds that ICT (information and communication technologies) capital contributed to raising the labor share in the US as it is the most advanced country in ICT use. Thus, technological change need not be unfavorable to labor. The authors of the World Economic Outlook report also find that, at the early stages, the adverse labor demand effects of ICT appear to be stronger; this can be explained by the fact that ICT adoption takes place prior to the needed adjustments in workers' education level (IMF, 2007a). However, and contrary to the conclusions of IMF (2007a), Stockhammer (2013) finds that technological change has a positive effect on wage shares in developing countries and a negative effect in developed countries.<sup>2</sup>

Two additional features stand out in the IMF (2007b). First, the WEO model is estimated separately for the income shares of labor in skilled and in unskilled sectors. It is found that the main factor that affects the income share of unskilled labor over the sample period is technological progress. This result is consistent with the belief that ICT equipment and computers complement skilled labor, while acting as substitutes for unskilled labor. Second, the IMF (2007b) finds that labor globalization contributed to the fall in the labor share in the skilled sector, which is congruent with the conclusions of earlier findings that most of the increase in offshoring was driven by the offshoring of skilled rather than unskilled inputs (IMF, 2007a).

Bental and Demougin (2010) propose an alternative channel through which ICT could affect the labor share in the majority of OECD countries. The authors advance a model in which firms are assumed to face two problems. First: a moral hazard problem. Generally, firms and workers bargain over wage contracts and, since the workers' effort is not contractible, firms need to incentivize the agreements. In the actual situation, workers get paid regularly regardless of their productivity since their wages have already been contracted. However, it is possible that there exists deficient incentive for workers to contribute their best effort, so the extra incentive

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<sup>2</sup> One reason for the result discordance may be that Stockhammer (2013) controls for financialization (see section 3) whereas the IMF does not, and that the IMF study purports to the case of the US alone while Stockhammer's results are for the group of developed countries.



is needed, which will cost firms extra money and cut their budgets for investment. Second is the investment irreversibility issue. Firms have to meticulously assign their limited budget, deciding whether to provide incentives to labor or to invest in capital.

The emergence of ICT technologies during the past two or three decades affects the two abovementioned assumptions presented by Bental and Demougin (2010). First, now that the workers can be better monitored, the need for incentivized contracts is reduced. Consequently, with higher monitoring precision coming from ICT advances, a certain level of effort can be achieved by lowering workers' bargaining power. Second, with greater bargaining position of firms, investment decisions are more efficient and firms receive a higher share of quasi-rents.

In addition, Bental and Demougin (2010) find that labor market reforms during the same period—including reduced unemployment benefits and the introduction of stricter eligibility criteria—reduced the bargaining power of labor in many countries. As a result, the labor share, as well as wage income, decrease relative to productivity. And more profitable capital investments divert firms to invest in more capital stock rather than labor.

Schneider (2011) provides an empirical assessment of Bental and Demougin's (2010) claim that the downward trend of the labor share was caused by improved monitoring precision allowed by the advances in ICT. Allowing the user cost of capital to change over time, Schneider (2011) concludes that the model by Bental and Demougin (2010) is also consistent with the observed trends in the US, Norway, Spain, and Japan.

Autor et al. (2003) argue that computer capital both substitutes for workers (in performing cognitive and manual tasks that can be accomplished by explicit rules) and complements workers (in performing non-routine problem-solving and complex communications tasks). The routine tasks become easier to monitor through ICT for several reasons: they are easily replaced by a computer, easier to learn, and more mobile. Thus, given improved monitoring precision brought by ICT, Oldenski (2010) finds that firms relocate rather routine tasks through foreign direct investments while non-routine tasks are performed within firms since communication is more important for these tasks.

This implies two possible effects of improved monitoring technology on the declining labor share. First, improved monitoring precision leads to a reduction in bargaining power of labor, and thereby implies a decline in wages. Second, it increases the offshoring possibilities of firms as a result of improved supervision of the production process abroad (Schneider, 2011).

### 1.3 Criticisms of the Capital-augmenting Theories

So far, the works presented in this paper embrace the capital-augmenting argument and conclude that technical progress has a negative impact on wage shares, except, perhaps, in the US. Corroborating this story are Elsby et al. (2013) who find limited support for the “neoclassical explanations based on the substitution of capital for labor.”

ILO (2013) shares this circumspection about the capital-augmenting hypothesis and denotes that technology has a limited effect on labor shares. Unlike other studies that consider solely the relationship between technological progress and the labor share, Stockhammer, the author of the study, also controls for other variables such as globalization, financialization, and welfare state retrenchment. Stockhammer finds that the impact of financialization on the wage share is much greater than the partial effects of other variables, including technological progress.

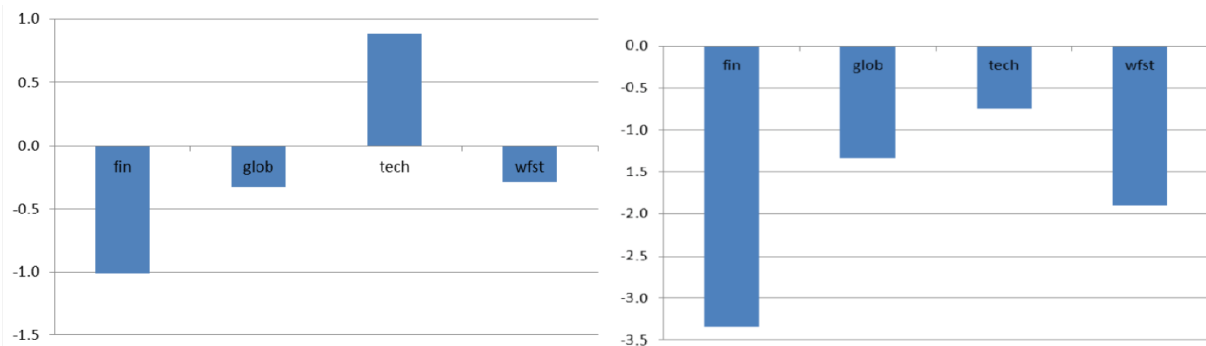
The ILO (2013) inquiry is based on a panel of 71 countries (28 advanced and 43 developing and emerging economies) during the period 1970–2007. The endogenous variable is chosen to be the wage share in the private sector (adjusted for self-employment), and alternative specifications of the labor share are considered, using different data sources. Independent variables in the model include growth, financial globalization, trade openness, government consumption as percentage of GDP, the logarithm of the PPP (purchasing power parity)-converted GDP per worker at constant prices (as a measure of technological change), the share of agriculture, and the share of industry (included to operationalize structural change in developing countries). The results for technological change show that all of the capital-labor ratio variables have statistically significant negative effects. This implies that either technology does not follow the features of the Cobb-Douglas model or that there has been biased technological change (ILO, 2013).

All in all, the ILO (2013) finds econometric evidence that challenges the widely-held view that the functional distribution of income in advanced economies has mainly been driven by technological change. Instead, Stockhammer (2013) finds that income distribution depends mostly on financialization—and this is regardless of the estimation method. Furthermore, by splitting the panel into developed and developing countries, Stockhammer finds that the effects of technological change is unequal: technological progress has positive effects on the labor share in developing countries but negative effects on advanced economies (see Figure 2).

A number of studies which investigate the effect of technological change on labor share confirm the negative correlation. The value of the elasticity of substitution between capital and labor motivated many studies (Acemoglu 2002; Acemoglu 2003; Klump et al., 2007; Chirinko, 2002). This is due to the central importance of the question in both the Cobb-Douglas and CES production functions framework (Giovannoni 2013a).

Vilmunen (2001), for instance, finds evidence in the Finnish economy that the elasticity of substitution between capital and labor is less than 1. This suggests that capital-augmentation is essentially labor-biased (Giovannoni 2013a). To be consistent with a constant factor share in the long-term, either the production function has to be of the Cobb-Douglas type or technology needs to be labor augmenting (Klump et al., 2007). Based on the argument that the long-run elasticity of substitution equals 1 because capital and labor can be easily replaced with each other in the long-run, Jones (2003) states that the direction of technical change is irrelevant for income distribution in the long-term Cobb-Douglas framework.

*Figure 2* Contribution to the Change in the Wage Share for Advanced Countries and Developing Countries



Source: Stockhammer (2013) for ILO.

Notes: Top: Developed countries, 1980/84 - 2000/04; Bottom: Developing and emerging countries, 1990/94 to 2000/04. The graphs to the right present the variability of the estimates to the left for different estimation methods.

Some literature from the 1960s tries to identify the economic forces that lead technological change to being entirely labor-augmenting in the long-term. This approach was initiated by Kennedy (1964), Samuelson (1965), Drandakis and Phelps (1966), and recently re-examined by Acemoglu (2002) using new growth theory.

Acemoglu (2003) underlines the coexistence of labor- and capital-augmenting technological change, but with asymmetric long-term properties. Based on the model proposed

by Acemoglu (2002), the direction of the bias of technological change is determined by the factor that is more profitable. There are two competing forces that determine the relative profitability of different types of innovation: (1) the price effect, which creates incentives for the development of technologies used in the production of more expensive goods (technology improvements that favor scarce resources), (2) the market size effect, which encourages the technologies that have a larger market; more specifically, technologies that use the more abundant factor. Since the elasticity of substitution between the factors of production determines the relative strengths of these two effects, an estimation of the elasticity of substitution is central in determining the direction of technological change.

Acemoglu (2002) notes that the rough stability of the labor share in the US while the capital-labor ratio has been increasing steadily suggests that technological change has been mostly labor-augmenting—unless the elasticity of substitution between capital and labor happens to be exactly equal to 1, but this has not been found to be the case. In a subsequent work, Acemoglu (2003) confirms that, along the long-run balanced growth path, the economy will have a steadily increasing wage rate and a constant interest rate. Long-run technical change will be purely labor-augmenting (Giovannoni 2013a). Only under the circumstance when the economy goes astray from the balanced growth path, will there be capital-augmenting technological change.

Klump et al. (2007) provide empirical evidence for Acemoglu's theoretical view. The authors apply a normalized CES production function with factor-augmenting technical progress, and estimate a supply-side system for the U.S. economy during the period 1953–1998. They found the elasticity of substitution to be significantly below 1, typically between 0.5 and 0.7. This result confirms previous results summarized in many places in the literature (see survey in Klump et al. (2011), and for details refer to Nadiri (1970), Nerlove (1967), Hamermesh (1993), David and Van de Klundert (1965), Griffin and Gregory (1976), Eisner and Nadiri (1968), Krusell et al. (2000) and Antras (2001), Chirinko, Fazzari, and Mayer (1999, 2001), and Klump et al. (2007).

In the case when the production function is not Cobb-Douglas and the elasticity of substitution is non-unity, to generate perpetual growth, the Solow model introduces labor augmentation. The production function has the form  $Y = F(K, AL)$ , where  $A$  is labor-augmenting technology that grows at an exogenous rate. Perpetual growth is feasible because

the endowment of effective labor  $AL$  grows over time and drives up the marginal product of capital, sustaining incentives for accumulation. Another solution has been proposed recently by Peretto and Seater (2013): rather than augmenting the non-reproducible factors (e.g., unskilled labor), firms learn to produce efficiently by eliminating some of the non-reproducible factors. In this model, firms “eliminate” the use of non-reproducible factors by devoting resources to R&D and changing the factor output elasticities ( $\alpha$  in the case of a Cobb-Douglas production function).

Figure 3 Technology and the Wage Share: Summary Diagram

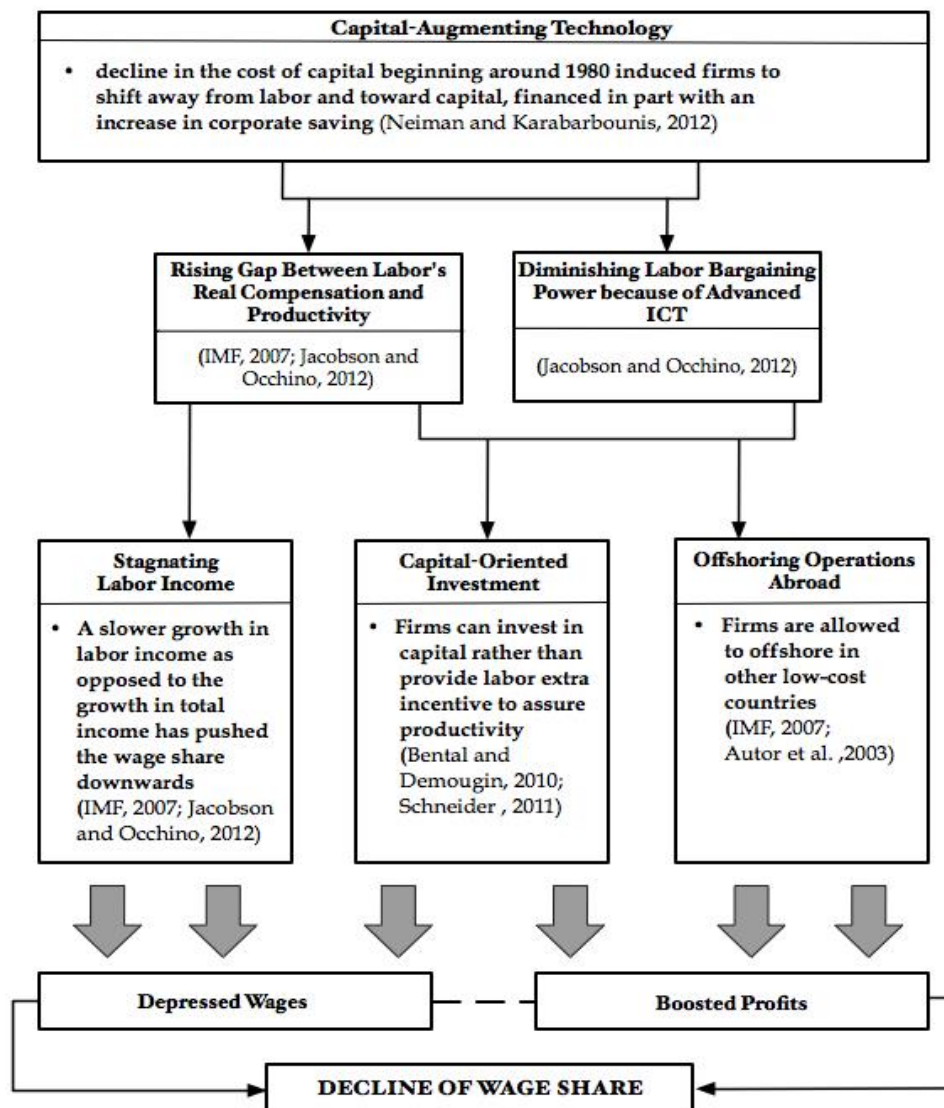
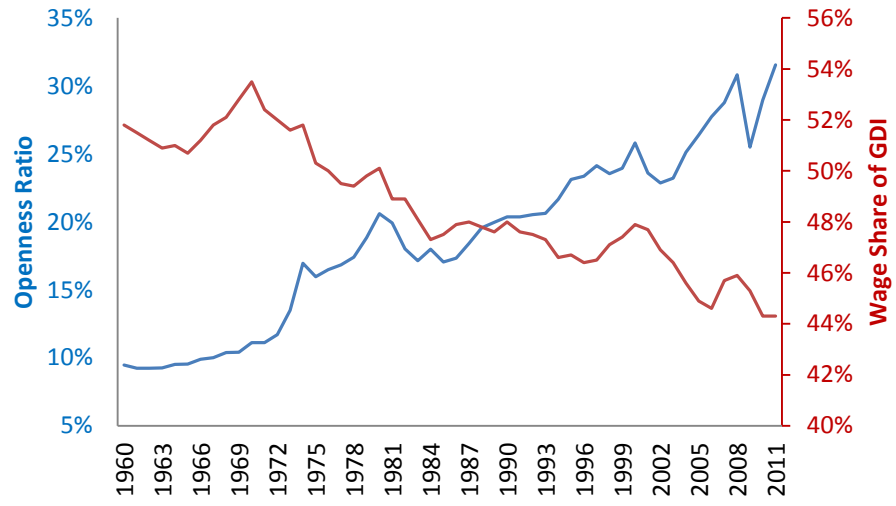


Figure 4 Openness Ratio and the Wage Share



Source: Krugman (2008)

## 2 INTERNATIONAL TRADE DID IT

The literature studying the effects of international trade on income distribution is vast; however much of it addresses the personal distribution of income, not the functional distribution (Harrison, 2002). Yet several facts point toward a possible trade effect on the functional distribution of income.

First, the classic trade models predict such an effect. Both the comparative advantage model and factor proportions model predict that wages in developed countries will be depressed, *ceteris paribus*, when those countries trade with lower wages, developing, countries. Second, the past 30 years have seen a tremendous increase in trade volumes between developed and developing countries, while at the same time, the labor share in developed countries has declined; the negative correlation is striking (see Figure 4). Are we to believe, following theoretical guidelines and empirical evidence, that international trade has dragged down developed countries' labor shares? Does correlation imply causality?

### 2.1 Rising Trade

The past three decades have been marked by significant changes to the international trade landscape. The US exposure to international trade, as measured by the openness ratio, has tripled (see Figure 4). The combination of barriers to trade declining (both natural and political), accelerating US aggregate labor productivity growth, and surging global GDP growth, have led to a significant increase in flows of international trade and investment, and a change in the composition of trading partners of the US (Haskel, et al., 2012).

During the same period, the global labor supply has increased fourfold (Jaumotte and Tytell, 2007). Developing countries have transformed from being primary product exporters before the late 1970s to becoming, increasingly, major exporters of manufactured goods, and more recently, exporters of selected services (Krugman, 2008).

By 2005, the value of US imports from non-oil developing countries surpassed that of developed countries (Haskel et al., 2012). Trade with developing countries, measured as the average of exports and imports, has grown at a slightly less dramatic rate, but like imports, by 2006 the US's total trade in manufactured goods with developing countries has become greater than in developed countries (Krugman, 2008). The trend of rising average hourly compensation in the US's 10 largest trading partners was commonly cited in the 1990s to allay fears about the

effect of trade on wages. However this trend has reversed recently, as the trade volume between the US and developing countries increases (see Table 1).

How has this changing landscape affected the U.S. distribution of income?

## 2.2 The HOSS Model: Implications and Limitations

The vast majority of studies on the effects of international trade on factor shares has been built within the classic Heckscher-Ohlin framework (Stockhammer, 2013).

The original Heckscher-Ohlin trade model (Heckscher and Ohlin, 1933) states that a country's comparative advantage is determined, among other things, by its factor endowment. The model predicts that countries will specialize in producing the good that uses their abundant factor intensively. Thus, capital-abundant (usually developed) countries are expected to specialize in producing and exporting capital-intensive goods, while labor abundant (usually developing) countries will specialize in the production and export of labor-intensive goods (Guscina, 2006).

*Table 1* Average Hourly Compensation in the Top Ten U.S. Trading Partners, 1975, 1990, and 2005

Year	Top ten trading partners (largest first)	Average Hourly Compensation (percent of U.S. average)
1975	Canada, Japan, Germany, United Kingdom, Mexico, France, Italy, Brazil, the Netherlands, Belgium	76
1990	Canada, Japan, Mexico, Germany, United Kingdom, Taiwan, South Korea, France, Italy, China	81
2005	Canada, Mexico, China, Japan, Germany, United Kingdom, South Korea, Taiwan, France, Malaysia	65

Source: Krugman (2008)

The Stolper-Samuelson theorem (Stolper and Samuelson, 1941) further predicts that the owners of the abundant factor will gain from trade while the owners of the scarce factor will lose. The HOSS model therefore predicts that the relative reward of labor compared to that of capital should go up ( $\Delta \frac{w}{r} > 1$ ) in labor-abundant countries and down in relatively labor-scarce countries.



If labor grows at the same rate as capital such that the capital stock per worker is constant in steady-state (Solow, 1957), international trade leads to  $\Delta \frac{wL}{rK} > 1$ . Assuming perfect competition and full employment ( $L = N$ ), as both Solow and Heckscher-Ohlin models do, the last expression implies that along the long-run equilibrium path, labor-abundant countries experience  $\Delta W > \Delta \Pi$ . Thus, classical international trade models imply that the labor share grows in labor-intensive countries and shrinks in capital-intensive countries. Part of this result rests on the price elasticity of the labor supply curve, which is an issue addressed elsewhere (see section 1 above). So from a theoretical point of view, greater international trade is expected to lead to factor price equalization (Samuelson 1948, 1949) but arguably as well to factor *share* equalization. But how do those theoretical claims hold up in practice?

The answer is: not very well. First comes the observation that the relative price of labor is not equal, nor does it tend to be equal (see Table 1). Then comes the evidence provided by empirical studies. Stockhammer (2013) finds that globalization had the *same* effect on the wage share in developed and developing countries. Indeed wage shares have followed the same downward pattern worldwide, in developed and developing countries, and among net exporters and net importers. Moreover, a number of studies based on the Stolper-Samuelson trade logic have been unable to find a relationship between trade and the recent trend of labor's declining share in the US (Haskel et al., 2012). Finally, Krugman (2008) acknowledges that trade with developing countries has probably depressed wages in the U.S. but with a magnitude hard to quantify.

The only channel through which international trade could explain worldwide falling shares is through a beggar-thy-neighbor, or race-to-the-bottom, phenomenon, whereby every country tries to out-export every other by boosting export competitiveness through internal devaluation and productivity exhortation. This channel may be at work, and would probably be even more important in trade-intensive regions whose currency cannot adjust, i.e. in the eurozone. Regardless of the channel, the effect of international trade on labor shares is ultimately an empirical question, and on that matter, Stockhammer (2013) provides estimates indicating that the effect is significant, but limited.

The legitimacy of classical trade theories rests on the limitations of their assumptions. The assumption of full employment is at odds with the popular perception that unemployment is created by the export of jobs abroad (Stockhammer, 2013). The assumption of perfect

competition has also become increasingly discordant with empirical evidence as the share of US national income going to owners of capital through corporate profits has surged (Harrison, 2002), which points more in the direction of increasing returns and imperfect competition (Krugman, 2008). The assumption of identical technology across borders does not hold in practice.

The increase in capital mobility relative to labor mobility that has characterized the most recent period of trade (Haskel, et al., 2012) confronts the classic trade models' assumption that factors are immobile. This, in itself, weakens the implications of the Stolper-Samuelson model substantially, making it unclear whether this approach is an effective guide to the current situation (European Commission 2007, Stockhammer 2013). On the other hand, Guscina (2006) argues that greater factor mobility would only amplify the equalization of factor returns implied by the Heckscher-Ohlin model. Yet even if it is the case, the previous limitations of full employment and perfect competition remain.

As a result of those limitations, a number of heterodox frameworks and numerous extensions of the Heckscher-Ohlin model have been developed to account for the recent developments in international trade. The introduction of heterogeneous firms and workers, and the allowance of intermediate goods have been major features of these extensions (Stockhammer, 2013). But the applications for such extensions are primarily focused on illustrating the influence of trade on the personal distribution of income within factors, rather than across factors (Harrison, 2002). Therefore, progress in expanding existing models based on factor endowment and relative prices have limited interest for our purpose. However, some studies have focused on the functional distribution of income. Progress has been made by outlining the effects trade has on factor mobility and its effect on the bargaining power of labor and capital.<sup>3</sup>

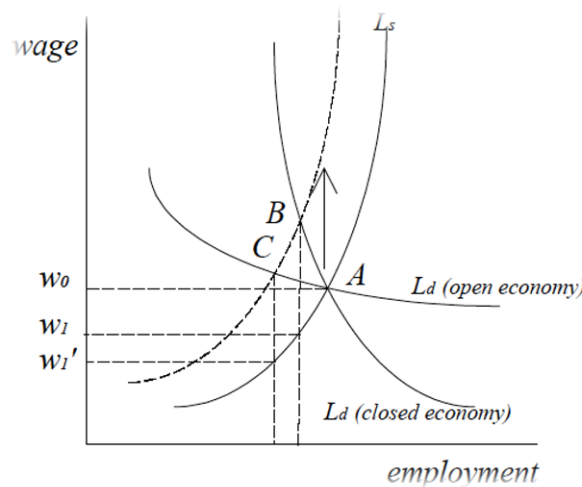
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<sup>3</sup> Models for factor mobility and bargaining power also overcome another classic limitation. A natural consequence of studying trade and its effect on functional distribution of income is the tendency to focus solely on trade between developed and developing countries, but the majority of trade conducted by most developed countries is with other developed countries (Rodrik, 1998).

### 2.3 Labor Mobility and Bargaining Power

Labor is either seen as (1) mobile, at least in the long-run, or (2) relatively immobile compared to capital, or compared to previous waves of immigration. In the case of (1) we have factor price equalization, and assuming full employment and falling wages in developed countries, the wage share should fall. In case (2) labor is losing bargaining power to capital and one expects the labor share to fall. So from a theoretical perspective, the labor share falls in both cases.

Figure 5 Capital Mobility Incidence



Source: Rodrick (1998)

#### **Labor Mobility**

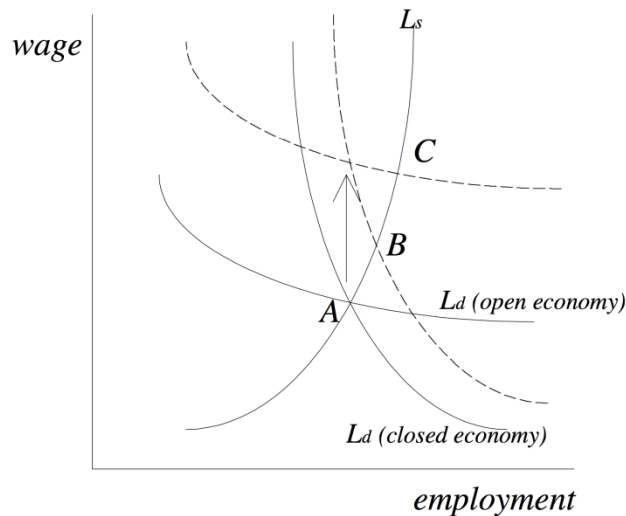
The economics of labor mobility are well understood. Rodrik (1998) for instance notes that the globalization of the 1990s bears a striking resemblance to the globalization of the early 20th century: trade flows in relation to national output are at similar levels, and capital flows are smaller than they were during the height of the gold standard. The notable difference between the two periods of globalization is the mobility of factors. While the mobility of capital has increased, the mobility of labor has declined significantly with increasing regulation of immigration. This trend has led to the cross-border mobility of capital, and the relative immobility of labor being a critical characterization of recent globalization, with the consequences of increased elasticity of demand for labor, and decreased labor bargaining power (Rodrik, 1998).

Capital mobility means that there are more trade and investment opportunities for employers (capital owners). This makes achieving high labor standards and benefits more costly

for workers as the elasticity of demand for labor increases. The implications of a more elastic demand for labor can be represented on a graph such as Figure 5.

The original equilibrium is at point  $A$ , with wages being  $w_0$ . An increase in employment standards can be viewed as a leftward shift of the labor supply curve. In a closed economy where the demand for labor is relatively inelastic, the burden of the increase in employment standards is shared relatively equally between employers and workers, with workers bearing  $w_1$  to  $w_0$ . In an open economy the demand for labor is relatively elastic, the same rise in employment standards sees workers taking on  $w'_1$  to  $w_0$ . Therefore, in an open economy, increases in employment standards lead to greater decreases in wages compared to a closed economy. Note also that another implication of Figure 5 is that a more elastic labor demand (open economy) will result in greater employment loss (Rodrik, 1998). Lower wages and lower employment lead to an expected lower wage share.

*Figure 6 Capital Mobility and Labor Market Volatility*



### ***International Trade and Bargaining Power***

Another implication of greater capital mobility in an open economy is that labor becomes easier to substitute, and hence a decline in the bargaining power of labor (Rodrik, 1998). In this scenario it is easier for capital to travel across borders toward countries with the cheapest labor. In order to retain capital and employers, workers may have to accept lower wages. When there is a decline in labor's bargaining power it becomes harder for workers to fight for higher wages while maintaining employment levels. Guscina (2006) finds evidence of increased openness to

trade, decreasing the power of labor unions. Harrison (2002) finds that greater capital controls benefit labor share while greater foreign direct investment (FDI) flows reduce the labor share (see below). Kristal (2013) finds that the decline in the labor share came mostly from sectors that were once more unionized.

Yet, more interestingly, Diwan (2001) finds that bargaining systematically causes a decline in the labor share during financial crises. Diwan considers financial crises as periods of intense bargaining and redistribution; and while physical capital is relatively immobile, financial capital will flee abroad if the country's short-term returns fall below international rates. Thus, labor is forced to bear a larger share of the losses during these intense bargaining periods.

### ***The Political Economy of Trade Approach***

A heterodox approach to trade's effect on the functional distribution of income through the political economy angle has been developed from Rodrik's notion of factor mobility and bargaining power (Rodrik 1998, Onaran 2011, Stockhammer 2013). This approach abandons the factor endowment model and uses factor bargaining power and factor mobility instead. Set in a bargaining framework, this approach argues that trade liberalization will benefit the more mobile factor by increasing its bargaining power. This implies that trade leads to a redistribution of *rents* instead of the equalization of factor costs (Rodrik 1998, Stockhammer 2013). The political economy of trade approach also finds that a redistribution of income could take place due to threat effects (Epstein and Burke 2001, Stockhammer 2013), as well as trade among similar countries.

Since the current wave of globalization is marked by an increasing mobility of capital and a relative labor immobility (Diwan 2001), the political economy of trade approach predicts a decline in labor's bargaining power and therefore predicts a decline in labor's share of income. When capital has a higher mobility, there is an implication that labor will have to compete harder to attract capital. Guscina (2006) finds that European employment protection policies, a proxy for labor's bargaining power, have become less effective following globalization, thus representing a decline in the bargaining power of labor. Guscina's (2006) regression results show that for the post-globalization era, the employment share increases with employment protection by about 0.08–0.10 percentage points. While the results do not show globalization having a dampening effect on the bargaining power of labor, as the pre-globalization results showed a 0.03–0.06 percentage point increase, the post-globalization results are not always

significant, whereas pre-globalization results were. The same conclusion can be reached from the perspective that the European Union has been built on the idea of free trade and greater labor market flexibility.

#### **2.4 Offshoring, FDI's and Income Distribution**

International trade theory predicts that reduced international barriers that allow workers' services to be more easily substitutable internationally. The greater ease of outsourcing and offshoring affects the bargaining position of labor adversely. Elsby, Hobijn, and Sahin (2013) find indeed that the offshoring of labor-intensive components is the leading explanation for the decline in the labor share in the US. However, the authors do not control for financialization (see below) or welfare retrenchment, so those channels may be more powerful than the outsourcing channel.

The linkage between capital account openness and the labor share can be understood in the same vein—an increase in capital mobility materializes the threat of relocating production abroad, causing labor to have a weaker bargaining power and an increase in the profit rate-wage rate ratio. This is supported by Jayadev's (2007) finding that a negative correlation exists between the degree of openness and the labor share, although the effect is not present for low-income countries.

Another measure that can be used to measure the effects of globalization on the labor share would be the intensity of FDI's in an economy. FDI's can generate two opposite effects: a positive force from spillover effects, and a negative influence due to the lower bargaining power of labor and depreciating exchange rates. The positive expectation for FDI is that following a rise in the ratio of FDI to GDP, it will not only increase labor demand but also improve the labor share through the transfer of more productive technology. However, if FDI's were to happen only mostly through mergers and acquisitions instead of long-term investments, spillover benefits would be limited and there would not be any major positive effects on economy-wide competitiveness, employment, and wages (Mencinger, 2003; Gallagher and Zarsky, 2004).

Small capital may suffer the most from FDI as it destroys jobs in the small domestic firms which are generally less competitive, further dampening the bargaining power of labor in these firms. Onaran's (2007) study of the wage share in Turkey, Mexico, and Korea revealed that an increased export intensity led to a decline in the manufacturing wage share in both Turkey and Mexico, but no significant effect in Korea. Similarly, FDI's and levels of economic

development have negative effects on the labor share in China; this is believed to have resulted from the regional competition for FDI which has significantly lowered the bargaining power of the labor force (Luo and Zhang 2010).

Another study by Maarek and Decreuse (2011) found a U-shaped relationship between the labor share in the manufacturing sector and the ratio of FDI stock to GDP. Most developing countries are trapped in the decreasing part of the curve. The fall of the labor share may indicate that the overall benefits from FDI did not improve the population's living standards, but have been captured by foreign investors instead. On the other hand, the effects of FDI and international trade on wages in the manufacturing industry in Central and Eastern European Countries yield different results for different time frames. In the short run, international trade shows no effect while FDI has a positive effect that is driven mostly by the capital-intensive and skilled sectors. In the medium run, the effect of FDI becomes negative; meanwhile, exports affect wages negatively but imports provide a positive effect (Onaran and Stockhammer 2007).

## **2.5 Overview of Recent Studies**

Harrison (2002) combined national account data from the United Nations with measures of trade openness, capital account restrictions, and capital flows, and found that globalization places negative pressure on labor shares in both poor and rich countries. Unlike the classical models of trade, her results indicate that changes in relative factor endowments, represented by the ratio of labor to capital, have a prominent impact on changes in the labor share, having found a significant negative coefficient for relative factor endowments.

This implies that the elasticity of factor substitution is relatively low. Therefore, a rise in the labor supply would lead to a more-than-proportional decrease in the return to labor relative to capital, and consequently reflect a fall in the labor share. If true, the quadrupling of the effective global labor supply between 1980 and 2005 (Jaumotte and Tytell 2007) may have an even greater importance than is currently believed. However, it is unknown whether the implications of Harrison's finding are confined to the within border labor force or if they could be expanded to encompass the effective global labor supply presented by Jaumotte and Tytell (2007).

Harrison's (2002) analysis also asserts that, in addition to relative factor endowments, flow of foreign direct investment (FDI), relative GDP per capita, large exchange rate depreciations, and increasing trade shares impact the labor share negatively. She assumes that

FDI flows indicate the ease with which capital is able to enter and leave a country; the more freely capital is able to cross borders, the lower the laborers' bargaining power will be. A higher relative GDP per capita would therefore decrease laborers' bargaining power as well, because capital is expected to flow toward regions where unit labor costs are lower (Diwan 2001). On the other hand, Harrison (2002) finds that capital controls and government spending have positive effects on labor's share. By using capital controls as a proxy for higher fixed costs of relocating capital, the significant positive result indicates that greater capital controls decrease the bargaining power of capital, and consequently raise the labor share.

Guscina (2006) studies the question of how trade has impacted the functional distribution through the classic Heckscher-Ohlin framework using the following equation:

$$Y_{it} = \beta_{0i} + \beta_1 X_{it} + \mu_{it}$$

$$i = 1, \dots, N, \text{ and } t = 1, \dots, T$$

where  $Y$  is a measure of labor's share,  $X$  is a matrix of explanatory variables and  $\mu_i$  is the error term.

Guscina (2006) looks at three dependent variables: the compensation share in national income, employment share in national income, and the Gini coefficient. She uses labor productivity for the whole economy and productivity per worker as proxies for productivity and technology; ratio of trade to GDP, trade share with developing countries, FDI to GDP ratio, ratio of capital flows to GDP, and ratio of capital flows to GDP as proxies for openness to trade; and union density, and employment protection as proxies for labor bargaining power.

Focusing on two periods, pre-globalization / pre-IT revolution and post-globalization / post-IT revolution, Guscina's study finds that both compensation and the employment share decrease with trade openness, but the effect is not as significant during the pre-globalization era for the compensation share. Guscina's results also show that a higher degree of employment protection benefits labor more than capital, but in the post-globalization era the degree of significance of employment protection fell. For every percentage point increase in openness, the compensation share falls by 0.13–0.15 of a percentage point, while the employment share falls by about 0.16 of a percentage point (the results are significant at the 99 percent confidence level and are robust to alternative specifications). Also, while a regression of the labor share on trade



share with developing countries showed a positive relation to compensation in the pre-globalization era, the same regression showed a negative relation to the compensation share in the post-globalization era.

Guscina (2006) theorizes that high trade barriers, high trade costs, and big differences in technology between countries caused the implications of the HOSS model to be weakened. When using FDI to GDP ratio as a proxy for openness and international capital mobility, results show that there is again a variation between the results for pre- and post-globalization. In the post-globalization period employment share fell by 0.10 to 0.15 percentage points for every percentage point increase in the ratio, implying that globalization seems to have heightened the effect of the ratio on inequality. This suggests that higher capital mobility tends to raise the average standard of living but is biased towards benefiting skilled labor.

Based on her findings, Guscina (2006) suggests that the decline in OECD member countries may have been mostly an equilibrium, rather than a cyclical, phenomenon. This implication is based on her finding that while technology in the pre-globalization era appears to be labor-augmenting, with labor's share increasing with faster productivity, technology after the IT revolution has been capital-augmenting. This finding, along with her other results, has led her to believe that the decline in the labor's share in OECD member countries may have been mostly at equilibrium rather than a cyclical phenomenon. Therefore, the declining labor share is in the process of adjusting to capital-augmenting technological progress and a more globalized world economy. Guscina further suggests that, despite declining wages and salaries, the effect on wealth may be smaller as increasing direct and indirect ownership of equities holding by households may be counterbalancing the effects of falling wages and salaries on wealth. For example, Jaumotte and Tytell (2007) used a microfounded model:

$$R_L = \beta_L + Y_{EL} \ln \frac{P_E}{P_A} + Y_{ML} \ln \frac{P_M}{P_A} + \beta_{LL} \ln \frac{L}{K} + \phi_{LK} X$$

$$+ \phi_{LM} \frac{L_M}{L} + \phi_{LC} \frac{K_{ICT}}{K} + \phi_{LC2} \left( \frac{K_{ICT}}{K} \right)^2 + \phi_{LP} LMP + \varepsilon_L$$

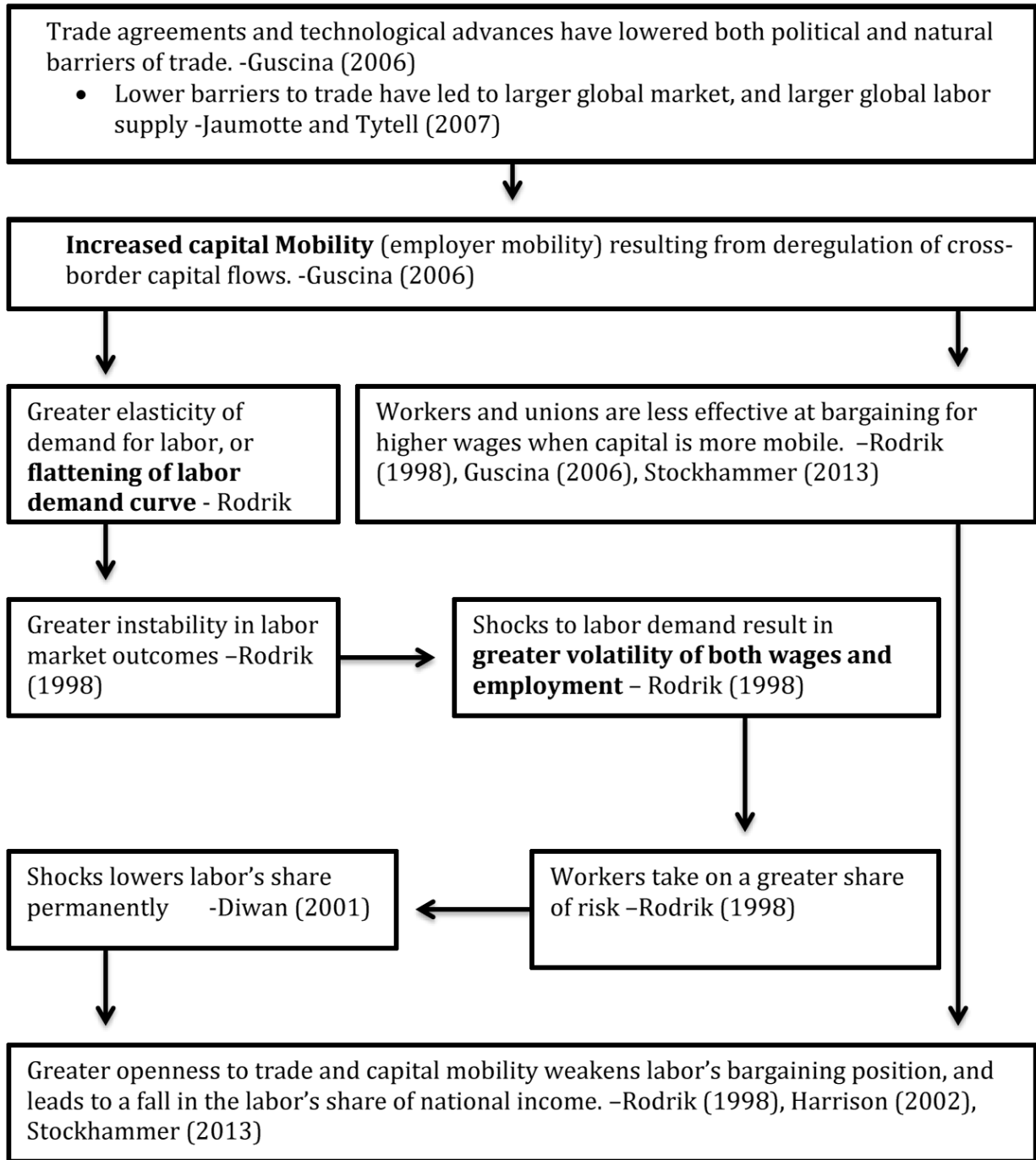
where  $R_L$  is labor share  $P_E$ ,  $P_M$ , and  $P_A$  are prices of exports, imports, and absorption, respectively  $L$  is labor,  $K$  is capital  $X$  is the intensity of offshoring  $L_M$  is immigrant

employment  $K_{ICT}$  is information-and-communication technology capital and  $LMP$  are labor market policies.

They estimated that, on an imbalanced panel of 18 advanced OECD economies over 1982–2002, higher relative export prices and lower relative import prices are associated with lower labor share (consistent with advanced countries exports being capital intensive and exports being labor intensive). More specifically, they find that offshoring and immigration are negatively related to the labor share, technology appears to have a nonlinear effect on the labor share, and that higher tax wedges and unemployment benefit replacement rates are associated with a lower labor share. From their study, Jaumotte and Tytell conclude that both globalization and technological progress have acted to reduce the labor share but argue that technology has played a larger role than globalization in reducing labor's share in developed countries. One criticism for Jaumotte and Tytell's study is that they only consider physical capital and do not include financial globalization in their analysis, reasoning that while the regression between financial globalization and labor shows significance, it is not as significant as the other variables. Furthermore Stockhammer (2013) argues that studies, such as the one by Jaumotte and Tytell (2007), that conclude that technological change has been the main driver of changes in income distribution are not correct. While technological changes have presented a negative effect on wage shares in developed economies, the effect is smaller and less robust compared to that of other factors.

Other empirical studies have also found a statistically significant relationship between globalization and functional income distribution. Jayadev (2007) found that for a pool of developed and developing countries, increased trade has a negative effect on the wage share. The IMF (2007a) offers several measurements of globalization such as trade openness, terms of trade, and measures of offshoring and immigration. Furceri et al. (2014) find that one important channel through which globalization affects inequality is the functional distribution of income. Using a panel of 149 countries the authors found that capital account liberalizations lead to persistent increases in inequality and persistent decreases in labor shares, changes which are particularly strong in advanced countries. Both Jayadev (2007) and Furceri et al. (2014) found that current account liberalization decreases the labor share by at least 0.7 percentage points, which is statistically significant, but not very.

Figure 6 International Trade and the Wage Share: Summary Diagram



### 3 FINANCIALIZATION DID IT

A burgeoning piece of literature has recently linked the decline of the labor share to a process loosely coined as “financialization” (Stockhammer, 2013; ILO-ILLS, 2012; Duenhaupt, 2011; Lee and Jayadev, 2005; Diwan, 2001; Lübker, 2007, Hein, 2013). The term chiefly denotes the weight of the financial sector, which has been increasing worldwide, particularly in the US, since the 1980s (Epstein, 2001, 2005, Palley 2007). This accelerated shift towards finance in the last three decades can be seen, among other things, through:

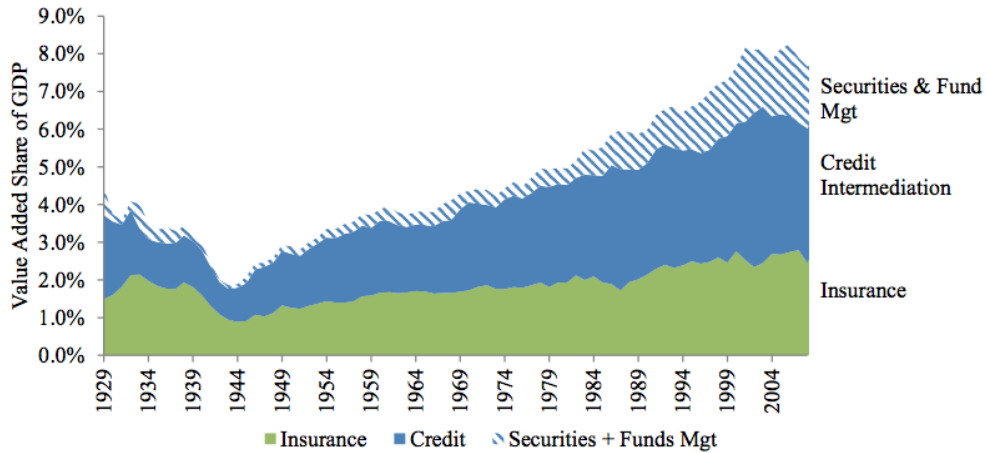
- the prominence of financial markets and financial institutions (Epstein, 2001, 2005)
- the greater participation of non-financial businesses in financial activities (Stockhammer, 2005)
- the increased level of household debt, the higher volatility of asset prices and exchange rates, and a bias towards short-term goals and shareholder value (Erturk et al., 2008; Stockhammer, 2010)
- the growth of mergers and acquisitions, globalization of trade and international finance, the rise of dividend and interest payments, and increased top management compensation (Hein, 2013)

Such changes affect the functional distribution of income through a number of channels, with the common effect of depressing wages and boosting profits. Thus, financialization leads to a fall in the wage share mostly, but not only by profits pushing it down. Before we get into the channels through which this happens it may be good to present evidence allowing us to grasp the extraordinary financial developments of the last thirty years.

#### 3.1 Stylized Facts: The Development of Finance

Financial services—consisting of insurance, securities and funds management, and credit intermediation—have nearly doubled as a proportion of US GDP over the last three decades, increasing from 4.9 percent in 1980 to 8.3 percent in 2006 (see Figure 7). On a global scale, Greenwood and Scharfstein (2013) identify the rise of financial services in a number of other countries (Belgium, Denmark, Switzerland Great Britain, Japan, Korea, Netherlands) in the period 1990–2006 (see Figure 8).

Figure 7 The Growth of Financial Services

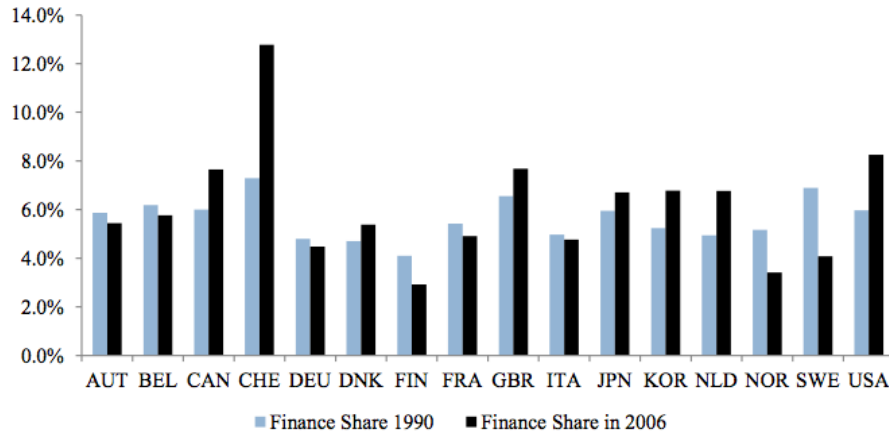


Source: Greenwood and Scharfstein (2013).  
 Notes: Data from the National Income and Product Accounts (1947-2009) and the National Economic Accounts (1929-1947)

Moreover, in the period between 1980 and 2006, compensation in the financial services industry rose by 70 percent, an increase partly driven by a greater use of highly specialized skilled workers (Phillipon and Reschef, 2009) but is out of line with the rest of the economy. As of 2013 the average wage in the financial services sector is about twice that in the rest of the economy (see Figure 9), a ratio only last seen in the 1930s in the US. This increase is tightly linked to the growth of IPOs, credit risk activities and greater financial deregulation (Phillipon and Reschef, 2009).

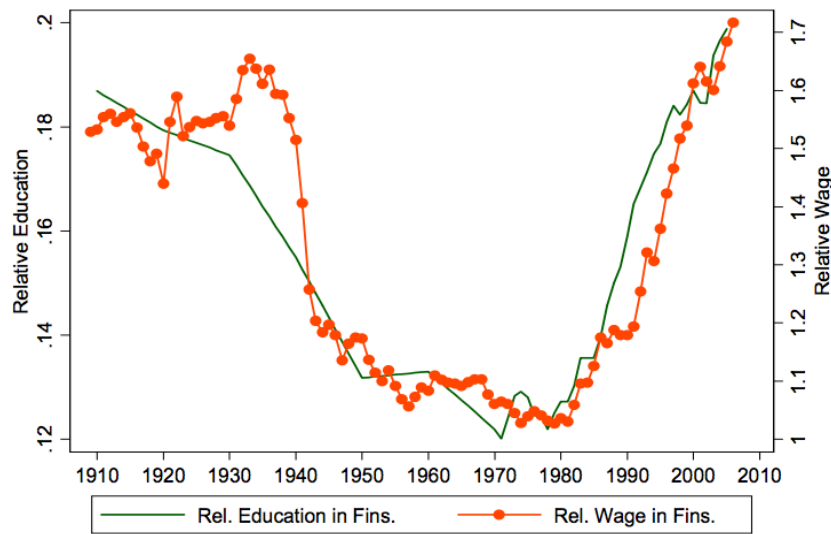
This surge in financial incomes and profits has been widely reported (Hein and Schoder, 2011; Onaran et al., 2011; DeAngelo and Skinner, 2002; Duenhaupt, 2011). The trend is primarily identified for interest payments, dividend payout and stock buybacks; however, rapid hikes in capital gains must also be added for certain periods (Power et al., 2003). DeAngelo and Skinner (2002), for example, point to the increase in aggregate dividends since 1978 due to a greater concentration of market power in a few large corporations.

Figure 8 The Growth of Financial Services as a Share of the GDP by Selected Countries



Source: Greenwood and Scharfstein (2013) using OECD data

Figure 9 Relative Wages and Education in the US Financial Sector



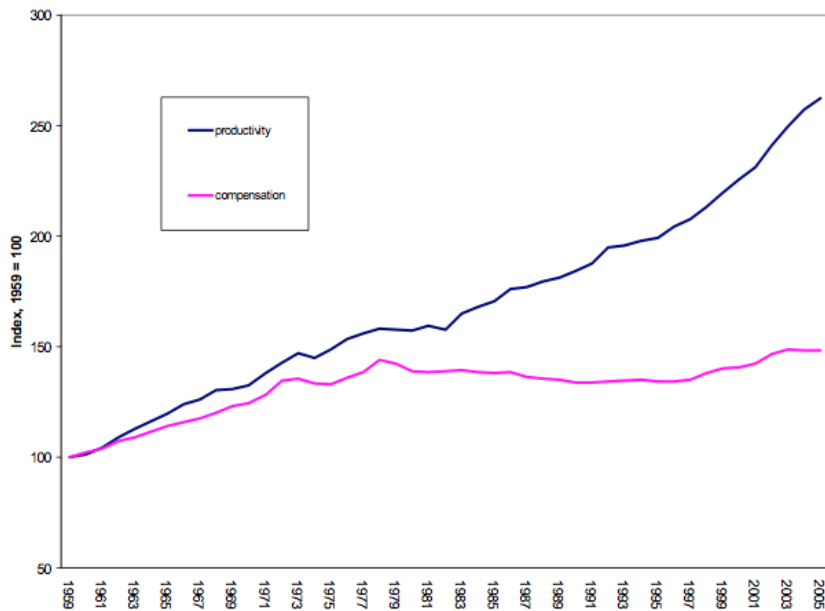
Source: Phillipon and Reschef (2009)

Alternatively, Duenhaupt (2011) draws attention to the growth in stock buyouts. The author cites the work of Jensen et al., (2004), who investigate the level and composition of CEO pay in S&P 500 firms in the period 1992-2002. Jensen, Murphy and Wruck (2004) find that, in 1992, base CEO salaries accounted for 38 percent of total CEO compensation, while stock options contributed 24 percent to the total income. By 2000, the share of base salary declined to 17 percent, while stock buyouts increased to 50 percent of the total CEO income. Despite a general fall of income in 2002, they find that stock options still represented 50 percent of CEO

salaries. Duenhaupt (2011) further cites Holmstrom and Kaplan (2011), who trace the source of the rise of interest payments. Homstrom and Kaplan (2011) find that the trend of increasing interest payments is due to the aforementioned growth in stock options, leveraged acquisitions and takeovers.

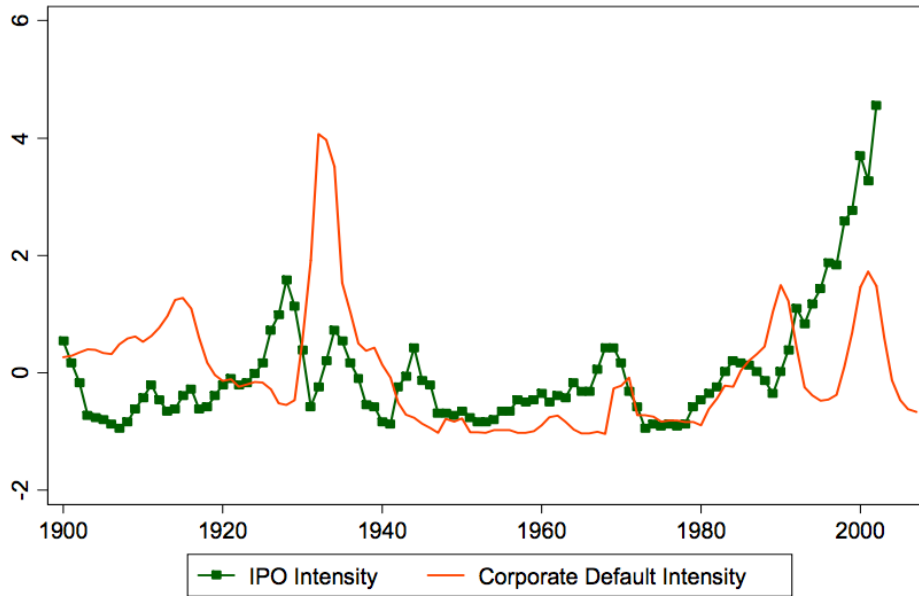
This spike in financial income and profits took place amidst faltering wages (Palley, 2007). Building on data published by the Economic Policy Institute, Palley (2007) observes that in the period 1959–1979, the growth in median wages followed the trend of rising labor productivity. However, in the post-1980 period, Palley (2007) underlines the divergence of the two: with wages stagnating and productivity continuing to rise (see Figure 10). The divergence would have been even greater, and therefore the wage share would have fallen even more, if one excludes the compensation of the top 1 percent, which is mostly due to skyrocketing financial incomes (Giovannoni 2013b).

*Figure 10* Index of Productivity and Median Hourly Compensation of Production and Non-supervisory Workers in the US, 1959–2005.



Source: Palley (2007) from Economic Policy Institute data.

Figure 11 Non-Financial Corporate Activities



Notes: IPO is IPO value over Market Capitalization. Defaults is the 3-year moving average default rate on all corporations. Both series are normalized (mean 0, std dev 1) over the sample. Data from Jovanovic and Rousseau (2005).

Source: Phillipon and Reschef (2009)

A number of economists have also called attention to an increased focus of non-financial corporations on financial investments (see Figure 11; Phillipon and Reschef, 2009; Krippner, 2005; Stockhammer, 2004). According to the World of Work Report (ILO-ILLS, 2011), non-financial firms in advanced economies increased their total financial assets from 81.2 percent of GDP to 132.2 percent of GDP in 2007. This can be partly explained by the extraordinary profitability of the financial sector, which increased from 14.2 percent in 1990 to 36 percent in 2006. A similar trend is identified in emerging economies where non-financial firms increased their total financial assets from 56.4 percent of GDP in 2000 to 87.4 percent in 2007, with a profitability of 32.1 percent that year (ILO-ILLS, 2011).

This increase in profitability may be partly explained by deregulation, financial innovations, and financial bubbles during the 1990s and 2000s. Financial returns should ultimately mirror the (expected, real) returns in the economy. However, much of those returns are now made in financial sectors, with the creation of bubbles over the past 15 years. In addition, it is difficult to find real investment projects providing rates of return greater than those provided by the financial sector, which makes the case of financial investment over real investment that much stronger. Thus, the development of finance has diverted investment flows



from the real economy in to financial markets.

In all, statistical evidence suggests a simultaneous slowdown of wages and accelerated growth in profits and financial incomes (Giovannoni, 2013b). The combination of the two puts greater pressure on the wage share and drives the profit share upwards.

### **3.2 Theoretical Inquiries**

Financialization could affect the wage share through several theoretical channels.

First, the deregulation and globalization of financial activities has altered the bargaining power of labor (Stockhammer, 2013; ILO, 2012). Stockhammer (2013) finds that due to a greater access to financial markets, firms face many investment options: investment in real or financial assets and domestic or foreign investment. As a direct effect of the widened capital- and geographic-investment scope, domestic firms are less dependent on real national investment and domestic hiring. Consequently, while companies attain larger investment and employment flexibility, workers face a weakening of their bargaining power; hence, a greater bargaining position of firms relative to that of labor.

Second, financialization coupled with a general stagnation of wages and the growth in income inequality has likely amplified the erosion of the wage share (Palley, 2007). The effect of structural changes over the last few decades—trade, globalization, deunionization, minimum wage stagnation, immigration, skill-biased technological change and higher CEO compensation—highly contributed both to the wage growth slowdown and the widening of the income gap (Palley, 1998a; Gordon and Dew-Becker, 2007; Levy and Temin, 2007). According to Palley (2007), the process of financialization intensifies the deterioration in labor power further modifies the functional distribution of income, primarily by shifting the focus from wage payments (workers' and managers' wages) to capital income (profit and interest payments).

Third, the rise of the shareholder-oriented corporate governance has aligned management interests with shareholder interests, thereby turning firms' objectives away from the fundamental goal of growth creation, and toward the goals of shareholder satisfaction and profit-maximization (Lazonick and O'Sullivan, 2000; Stockhammer, 2005). In order to present the impact of this new orientation, Stockhammer (2005) underlines the differing interest of firms' social groups; in particular, the separation of control (management) and ownership (shareholders) based on a nonaxiomatic (but institutional) post-Keynesian model. According to this model, shareholders, workers and managers follow contrasting utility functions:

shareholders are primarily occupied by profits, workers are concerned with higher wages and employment, and managers hold an intermediate position. Based on the simple model adopted by Stockhammer (2004) that assumes sole preoccupation of managers with growth and exclusive concern of shareholders on profits, the utility functions of management ( $U_M$ ) and shareholders ( $U_o$ ) are:

$$U_M = U(g) \quad (1)$$

$$U_o = U(r) \quad (2)$$

where  $g$  is investment or growth of the firm and  $r$  is the profit rate. Hence the firm's objective function  $u(\cdot)$ , expressed as Nash bargaining event:

$$u = u(g, r) = I^{1-\beta} R^\beta \quad (3)$$

where:  $I$  is investment,  $R$  is profit and  $\beta$  is an index of shareholder power.

Next, Stockhammer (2005) expands the model by considering the growth-profit trade-off that firms face in the post-Keynesian model. This trade-off is implied by default from the separation of ownership argument, and, an inverse relationship between current distributed profits (paid-out earnings) and current investment expenditures (retained earnings). According to the model, since, by assumption, both growth and profits are components of the objective function of a firm, then the firm will tend to "overinvest" beyond the profit-maximizing level of investment. Assuming a simplified linear growth-profit trade-off, profit is determined by:

$$R = I_R - tI \quad (4)$$

where  $I_R$  is the profit-maximizing investment level and  $t$  is a constant.

Next, maximizing Equation (3) subject (4), Stockhammer (2005) arrives at the optimal investment and profit levels:

$$\begin{cases} I^* = \frac{(1-\beta)I_R(Y)}{t} \\ R^* = \beta I_R \end{cases}$$

and concludes that the effect of an increase in shareholder empowerment on real investment is negative at the microeconomic level:

$$\frac{\partial I^*}{\partial \beta} = -\frac{I_R}{t} < 0 \quad (5)$$

Translating these findings to the macroeconomic level, Stockhammer (2005) finds that the development of a shareholder-oriented corporate governance has shifted firms' priorities toward profits at the cost of "real economy" investment. The rise of profits as a result of institutional changes further implies the suppression of wages and, hence, a drop in wage share.

The ILO (2012) examines the means through which these new institutional changes have likely led to the depletion of real, productive investment. The two primary channels are: increased dividend payments that lift stock prices (increase in shareholder value) and risky financial investment (delivery of short-term returns). The combined effect of increased financial activities on the real economy's capital stock in advanced economies is assumed to be negative. The macroeconomic result: a rise in financial investment and a relative drop in real investment.

Fourth, based on the Kaleckian theory of functional income distribution, Hein (Hein and Mundt, 2012; Hein, 2012, 2013) distinguishes between three determinants of the price mark-up—the degree of competition in the goods market, the bargaining power of trade unions, and the overhead costs and gross profit targets—which indirectly influence the wage and profit shares of income as follows:

$$\omega = \frac{W}{W + \Pi} = \frac{1}{(1+z)\mu + 1} \quad (6)$$

$$h = \frac{\Pi}{W + \Pi} = \frac{(1+z)\mu}{(1+z)\mu + 1} \quad (7)$$

and by definition:  $\omega = 1 - h$ .

where  $\omega$ : wage share,  $h$ : gross profit share,  $\Pi$ : gross profits,  $W$ : wages for direct labor,  $\mu$ : mark-up,  $z$ : relationship between unit material costs and unit labor costs, defined as,  $z_j = \frac{p_f e \mu_j}{w a_j}$ ,  $p_f$ : unit price of imported material or semi-finished products in foreign currency,  $\mu_j$ : imported materials or semi-finished inputs per unit of output,  $e$ : exchange rate,  $a$ : labor-output ratio,  $w$ : nominal wage rate.

In the Kaleckian framework adopted by Hein (2012, 2013) and Hein and Mundt (2012), financialization alters the wage share through the mark-up  $\mu$ . The shift in sectorial composition away from public and non-financial business sectors toward the financial business sector is associated with an increased concentration and monopoly power of the corporate financial industry. To put it differently, higher labor income share of the financial sector causes a rise in the mark-up  $\mu$ . This happens through tacit agreements, implicit cartels, and growth of other forms of competition such as marketing or product differentiation relative to price competition. The aggregate microeconomic result of financialization leads to an increase in the mark-up and causes an overall drop in the labor share of income for the whole economy, at the macroeconomic level.

Hein and Mundt (ILO, 2012) also consider the theoretical effect of the level of unionization and labor-bargaining power on the wage share in the context of the Kaleckian equations 7 and 8. The authors acknowledge the deterioration of labor power as a significant factor leading to a decline of the labor share (caused by weakened bargaining power of trade unions); this confirms the argument in Kristal (2013). Building on the model of strategic behavior between firms and workers, the authors note that stronger trade unions imply higher wages demanded for the purpose of offsetting the effects of the excesses of market power determined by the mark-up. This property, in turn, creates incentives for firms to constrain their

mark-ups. Based on these theoretical assumptions of the Kaleckian model, the recent de-uniozation trend has weakened the bargaining position of labor, thereby allowing firms to sustain mark-ups with a depressed wage share.

Last, Hein and Mundt (ILO, 2012) emphasize the role of increased management compensation and the growth of overhead costs—including depreciation of fixed capital, salaries of overhead labor, and profit claims of the rentiers in the form of dividend and interest payments of the corporate sector—in influencing the degree of monopolization; hence, the labor share. According to Kalecki’s equation (1954), the growth in overhead costs reduces gross profits.

$$\Pi = \mu(W + M) - S \quad (8)$$

where  $\Pi$  : gross profits,  $W$  : wages (variable),  $S$  : salaries (fixed),  $M$  : cost of raw materials (fixed),  $\mu$  : average mark-up for the whole economy.

This, in turn, potentially leads to the emergence of tacit collusive agreements with the purpose of preserving favorable profit margins. Building on the idea of interest rate (or interest payments) and dividend payments elastic to the mark-up adopted in the Kaleckian framework, Hein and Mundt (ILO, 2012) assert that prolonged period of increased interest rates (or payments) triggers firms, on average, to raise their mark-up prices in order to remain operational, thereby lower the wage share. In addition, the authors argue that the sustained increase in dividend payments (a type of overhead obligation that emerged alongside recent financial developments) creates incentive for managers to transfer the opportunity cost of refraining from real investment (through retained earnings) into higher mark-up. This is achieved by means of raising prices or pushing down unit labor costs. Financialization has made this process more feasible due to the aforementioned effects of reduced bargaining power of labor.

In summary, the theoretical models above promote the idea that financialization leads to a slump in wages (weakening of workers’ bargaining position, shift away from labor toward capital) and a leap in profits (empowerment of shareholder interests, greater stress on financial activities). Both trends individually and jointly participate in the deterioration of the wage share and the rise in the profit share.

### 3.3 Recent Empirical Studies

What can be learned from empirical investigations? The empirical literature on the labor share has flourished in recent years. This is despite the scarcity of theoretical contributions and the difficulty in measuring “financialization” other than by recourse to proxy variables.

The proxy variables used in the literature include, but are not limited to: capital controls and capital mobility (Rodrik, 1998; Harrison, 2002); foreign direct investment inflows (FDI, Onaran, 2009); FDI stocks (IMF, 2007b); dummy variables that isolate exchange rate crises (ILO, 2011); rentier income of non-financial business as a measure of shareholder value orientation (Stockhammer, 2004); financial globalization, measured as the sum of foreign assets and liabilities as a share of GDP; and financial reform variables such as credit controls, interest rate controls, entry barriers, privatization, international capital flows, security markets, and financial reform indices (ILO and ILLS, 2011; ILO, 2013).

Regardless of the variable or combination of variables chosen, the empirical literature overwhelmingly finds that the primary force behind the decline in the wage share has been financialization, even after controlling for changing institutions and increased international trade.

For instance, the ILO and the International Institute for Labour Studies (ILO-ILLS, 2011) find that the global integration of financial markets is the main contributor to the decrease in the wage share. The study takes AMECO wage share data for European countries, uses a generalized least squares technique in a panel regression and finds that the effect of financial globalization on the wage share is significantly negative for the majority of the examined high-, middle- and low-income countries.

Likewise, Lee and Jayadev (2005) use capital account openness to show that financial openness depressed the labor share in developed and developing countries during the period 1973–95. Applying a simple OLS cross-section regression (with the labor share estimated by the United Nations’ system of national accounts, Table 103) and more advanced robustness tests (Jayadev, 2003, 2007), the authors conclude with the unambiguous, negative effect of capital account openness on the labor share. Put differently, financial liberalization is related to a lowered share of productive income passed on to labor. Lee and Jayadev (2005) explain their empirical outcome by singling out one argument: the liberalization of the capital account leads to a weakening of labor’s bargaining power with the consequence of a declining labor share—both in developing and developed countries.

Similarly, Diwan (2001) applies simple least squares panel-data techniques and finds that the labor share falls by 5.0 percent points of GDP during each financial crisis, with a partial rebound afterwards. The author notes that the estimated decline in the labor share during a crisis may be explained by a country's leverage, its financial structure, trade openness, and capital openness and control regimes. Altogether, Diwan (2001) estimates that the cumulative effect of financial crises during the last three decades led to an overall fall in the labor share by 4.1 percent of GDP.

Lübker (2007) summarizes the conclusions of critical literature by emphasizing an empirical consistency of the negative effect of financial openness and financial crises on the labor share.

Other studies focus on the influence of the institutional changes that emerged along, or perhaps caused, the rise of financialization, such as shareholder-oriented corporate governance, intensified short-term profit-driven practices, and hedge funds (Lazonick and O'Sullivan, 2002; Stockhammer, 2002; Hein and Schoder, 2011; Argitis and Pitelis, 2001).

Stockhammer (2004) provides empirical support for the effects of the “shareholder revolution”—emergence of a market for corporate control that realigned management interests with shareholder interests—on real investment. The results of the study, based on a time series analysis of aggregate business investment, show evidence that financialization resulted in a slowdown of real capital goods accumulation in the US, the UK and France.

Similarly, Orhangazi (2008) presents additional empirical affirmation to the claim that the orientation toward profit maximization of financial institutions has a negative effect on capital accumulation. This is based on the results of a dynamic Arellano-Bond Generalized Method of Moments (GMM) model applied to US firm-level data during the period 1973–2003. To explain the connection, Orhangazi notes that the process of financialization alters the behavior of non-financial corporations (NFC) by placing a greater focus on financial investment over real investment; thus, lifting up financial profits. This new trend in the behavior of NFCs—in the face of greater pressures from financial markets to deliver short-term returns—triggers additional transfers to financial markets such as dividends, interest payments and stock buybacks. In short, rising financial profit opportunities and higher financial payments result in a decline (or slowdown) in real sector investment and capital accumulation. Thus, building on the theoretical claims, a greater focus on financial profit may explain the decline in the wage share.

Lin and Tomaskovic-Devey (2013), too, present empirical results for the negative

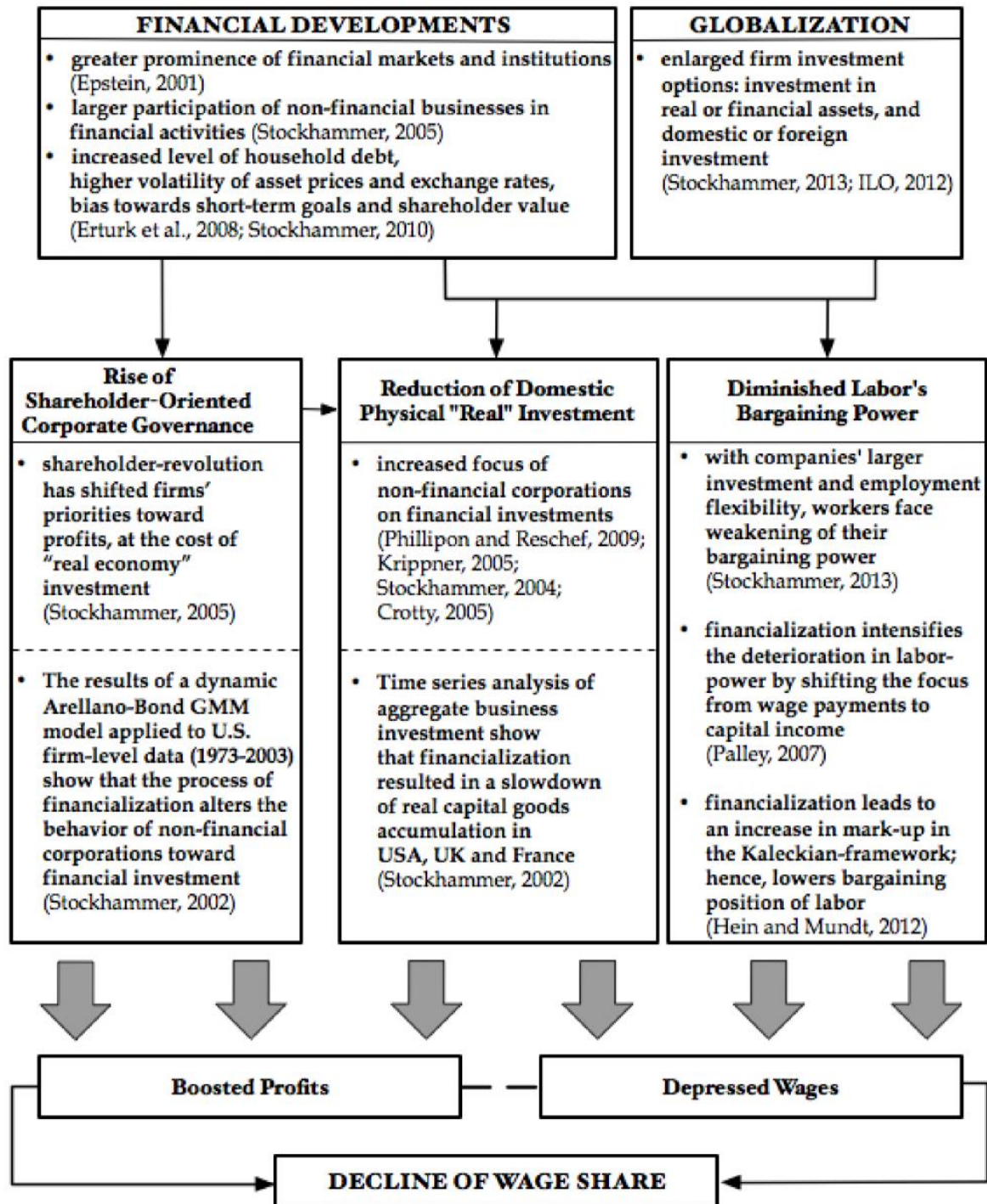
relationship between financialization and labor's share of income. Using cross-section data of the US non-financial sector, the authors find that, in the long-run, increased reliance on financial income is related to a decline in labor share, higher top executives' share of compensation and greater polarization of workers' earnings. Drawing on the outcome of their counterfactual analysis, Lin and Tomaskovic-Devey (2013) conclude that financialization may have contributed to more than half of the fall in the labor share of income.

The most recent study conducted by the ILO (ILO, 2013) adopts four econometric methods—Parks estimator (cross-section fixed effects), first-difference (FE) estimator, non-overlapping 5-year average data methods, and GMM estimator—to measure the effect of technology, globalization, welfare state retrenchment and financialization on the wage share. The sample size consists of 71 countries (28 of which are OECD high-income economies). The results of the ILO's (2013) study consolidate the conclusions of the primary economic literature by ascribing 46 percent of the global fall in the wage share to financialization alone, 25 percent to institutional factors, 19 percent to globalization, and 10 percent to technological change.

Overall, empirical investigations tend to agree with those theoretical and statistical insights: in most of the countries studied, there exists a negative relationship between financialization and the wage share (see Figure 12). This result has been strongly confirmed in advanced economies while the relationship for emerging and developing countries is less robust. The difficulty empirical studies face, as well as possibly the weak results for developing countries, lies in the choice of variable to represent the development of finance.



Figure 12 Financialization and the Wage Share: Summary Diagram



#### 4 CONCLUDING REMARKS: FACTOR SHARES AND INEQUITABLE GROWTH

The quartet of causes frequently mentioned for factor shares' behavior are: technology, international trade, financialization and welfare retrenchment (i.e., policy). We have detailed the literature on each one except for the last, which we leave for a subsequent and more detailed study. A few stylized facts have emerged:

- Technology or capital-for-labor substitution appears to have played a relatively minor role in the evolution of labor shares. If anything, technology has actually raised the labor share in the US, and many studies have found that capital and labor are complements, not substitutes, at least over the long run. According to the IMF (2007b) and Stockhammer (2013), technology has had a positive impact on the US's labor share. Only continental Europe can be isolated as a place where technology may have had a significantly depressing effect on wage shares. There are many studies confirming this overall picture, and little dissent.
- Market liberalizations and welfare state retrenchment have had more negative effects, especially in Europe. In particular, de-unionization seems to receive weak- to moderate support. There is a limited number of studies of those phenomena and more are needed.
- International trade, capital mobility, FDIs and "globalization" all have had negative effects on the labor share both in developed and developing countries, taken as groups. Whether some individual countries have been "winners from trade" in the Heckscher-Ohlin sense, is left to another inquiry. It is important to note, however, that even net exporting countries like Japan, Germany, and China have experienced declining, not rising, labor shares, so that the HOSS model might not be the most appropriate. Many studies confirm this fact, and often place trade and globalization as the number one reason labor shares have fallen (Elsby et al. 2013).<sup>4</sup> Those studies, however, do not control for financialization.

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<sup>4</sup> This is mostly true over the past two decades, not so much before that (see Krugman 1995)

- Financialization is found to be the single most depressing force underlying the fall in labor shares worldwide. This is true in a fair amount of studies which account for the phenomenon—which they often fail to do. The evidence appears convincing; however, given the predominance of financialization over all other determinants of the labor share, more studies would be welcome.

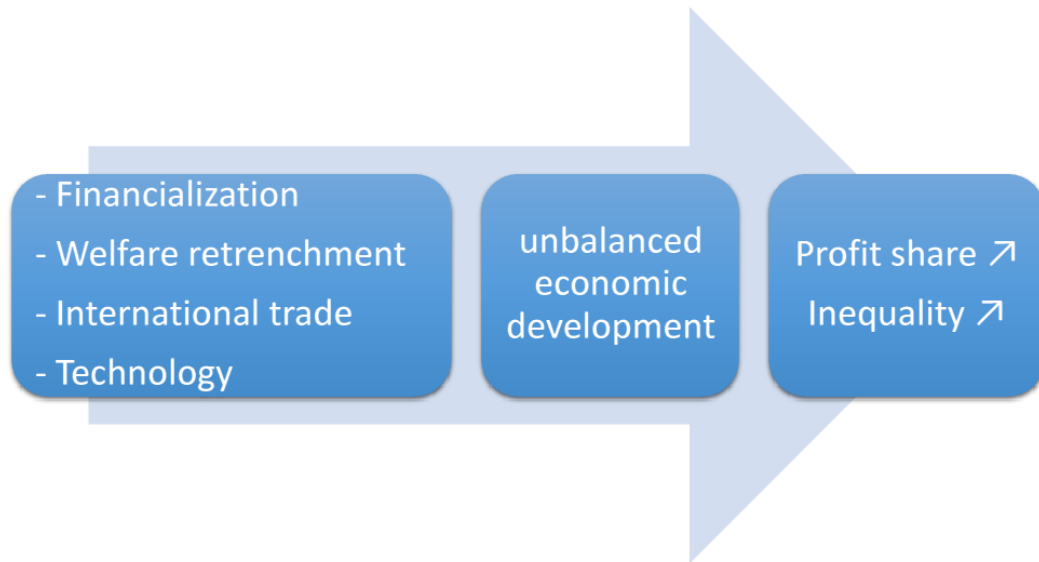
All in all, it seems that labor shares have fallen as much because they are dragged down by globalization and welfare retrenchment, as they are pushed down by the rise of financialization and the rise of the profits / property share.

### ***Top Incomes, Factor Shares and Inequality***

Finally, one may go a step further by noting that technology, trade, welfare retrenchment and financialization not only affect the labor shares. They all have in common to lead to biased growth in the sense that they will not affect the whole population *equally*. Welfare retrenchment hurts the poor the most; technological change hurts the unskilled; international trade creates winners and losers; and financialization benefits those who are finance-savvy, connected, and already wealthy. Because of this, technology, trade, welfare retrenchment, and financialization are at the root of another phenomenon: inequality. The link between the relative factor shares and inequality has been suggested recently in ILO (2012), Elsby et al.(2013) as well as in Furceri et al. (2014).

On one hand we have the poor, the unlucky, the welfare-dependent and the unskilled, whose relative positions have worsened; on the other hand we have the skilled, wealthy, lucky and independent individuals, whose relative positions have improved. In practice the middle class falls in the former group, with only top incomes gaining ground recently. The income gap between those two groups has widened and inequality has risen. Thus, the fall of the labor shares and the rise of inequality are but two manifestations of one and the same cause: unbalanced economic growth. The process is described in Figure 13; if this hypothesis is correct, one should see a parallel increase in the property share and inequality. Figure 14 presents the evolution of those two series using the Census Gini for the US and a measure of the property share including the top 1 percent incomes. Implicitly this means that we treat the top 1 percent as economic rents.

Figure 13 The Unbalanced Growth Process

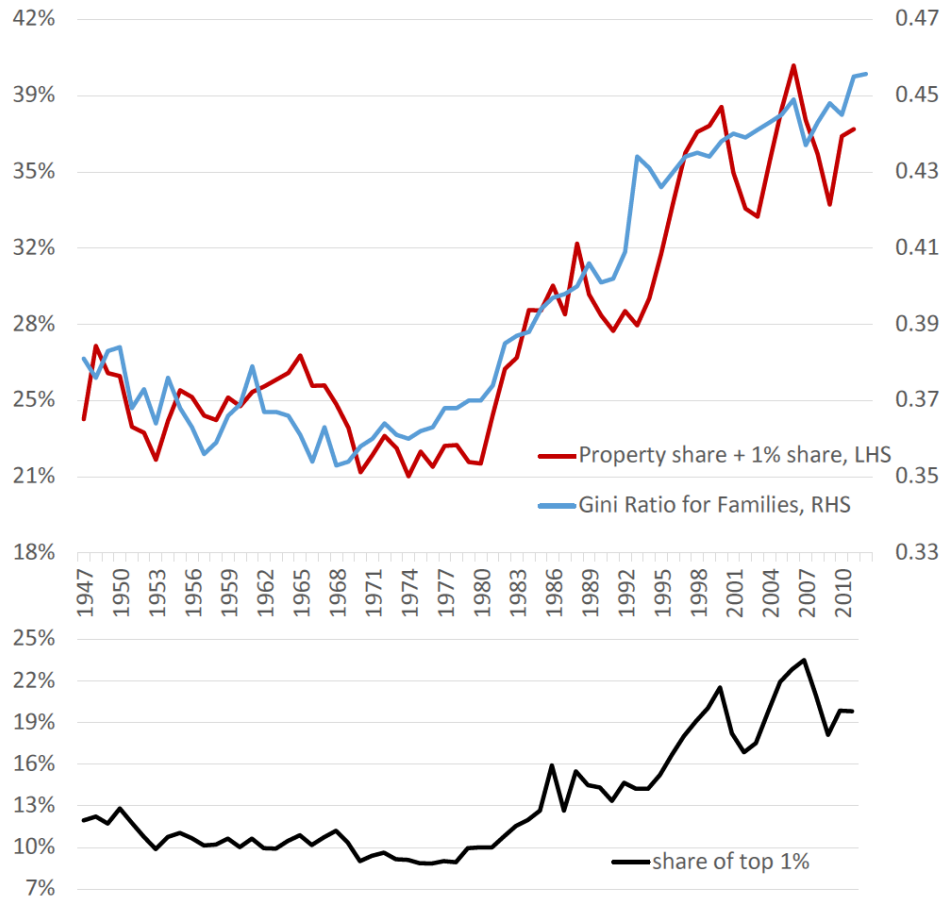


The evolution of the property share and inequality is remarkably parallel. This evolution is best described as period of relative stability from 1947 until the early 1980s, followed by a constant rise thereafter. This is a very peculiar evolution and such cointegration is unlikely to be due to chance. It must be that there is a common driving force, or a set of driving forces. We know what they are:

1. On the one hand, we have the divergence of the top incomes, materialized both in the Gini ratio as well as the property share in Figutr 14; this is the common denominator
2. On the other hand, this study has illustrated the quartet of factors causing inequality and deteriorating factor shares: technology, trade, finance, and welfare retrenchment.

Thus (1) and (2) are the two sides of the same coin. Unbalanced economic growth is mostly manifested through the rise of top incomes, with rising property shares on one side and increasing inequality on the flip-side.

Figure 14 Inequality and the Property Share



Source: Giovannoni (2013b) and Census Bureau Table F4.  
 Note: a break appears in the inequality series in 1993 due to a change of definitions.

Finally, the finding of the correlation between inequality and property shares allows us to clarify the debate about which channel of inequality is the most potent or likely. The rise of the top 1 percent (and consequently the rise of inequality and the rise of the property share) can be clearly dated to the early 1980s. This date is at odds with the “trade did it” and “technology did it” explanations of inequality, as there is no such corresponding clear-cut date in the evolution of trade and technology. What seems more likely to explain the rise of the property share, the rise of top incomes and the rise of inequality are the other two factors—financialization and welfare retrenchment (the policy channel). And to the extent that financialization was helped, if not created by liberalization policies, it seems that unbalanced economic growth was at least partly the result of a policy choice.

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