

## **How structural reforms of labour markets contribute to a productivity slump.**

### **An essay on neoclassical versus evolutionary efficiency**

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#### **Abstract:**

Structural reforms of labour markets according to 'supply-side' economics receipts are one of the causes of the post-2005 productivity growth slowdown in the Triad (USA, EU, Japan). Structural reforms have removed labour market rigidities that are useful for innovation. Labour markets that work better (in a neoclassical view), are working worse from an evolutionary innovation perspective, especially if innovation requires a highly cumulative knowledge base – which is the case in many knowledge-driven manufacturing and service industries. In the end, lower productivity growth leads to a labour-intensive growth path and hence to tighter labour markets that can improve the bargaining position of labour. Higher wage cost pressure has the potential of enhancing the diffusion of modern process technology which can support a return to higher productivity growth.

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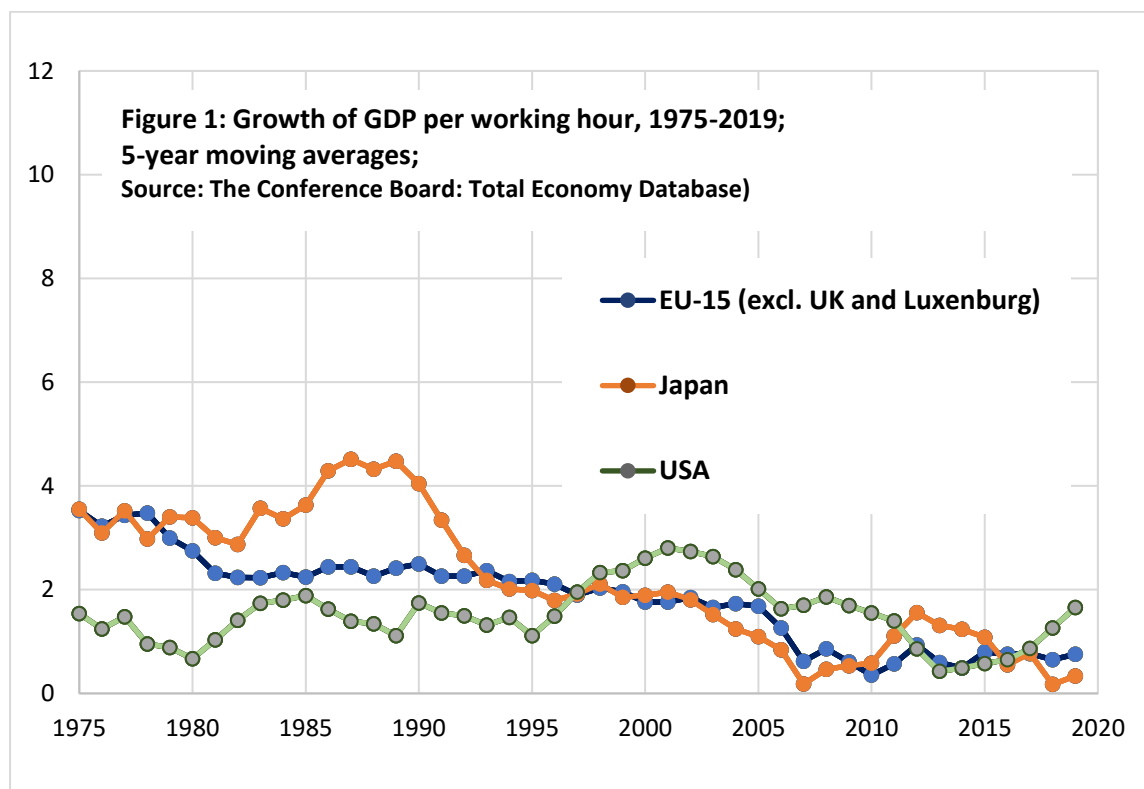
**Key words:** Productivity slump, Supply-side economics, labour market rigidities, innovation regimes.

## 1. Introduction: A slowdown of productivity growth in the Triad

Stories about artificial intelligence suggest that we are currently living in the age of a new technological revolution, sometimes referred to as a *Second Machine Age* (Brynjolfsson & McAfee 2014). With self-learning systems, artificial intelligence creates new opportunities to replace humans by machines. In their highly cited 2017 study, Carl Frey and Michael A. Osborne estimated that 47% of all jobs in the US (and 53% in Europe) might be replaced by intelligent machines in the next two decades. The authors expect that this will primarily involve low-productive work in transport and logistics, but also in offices and in manufacturing.

The only problem is that the new technological revolution is so far not visible in statistically representative productivity figures. Should a new technological revolution unfold, it should be visible in productivity indices. But this is not the case – on the contrary. Figure 1 shows the annual growth rates of GDP per working hour as a measure of labour productivity for the EU-15, Japan, and the US. The figure shows a decline in labour productivity growth around 2005. Labour productivity growth remained solid above 2% in Europe and Japan from the mid-1970s until the turn of the century. In the US it is persistently lower. The US experienced, however, a surge in productivity growth between 1994/95 and 2004/05. This can be attributed to the IT boom in regions like Silicon Valley (Gordon 2016). With the fading of the US ICT boom around 2004/05, growth rates of labour productivity are falling in all three blocks of the triad. Figures for the so-called multi-factor productivity show a similar pattern (Cardarelli & Lusinyan 2015).

We must conclude: Ironically, in the age of AI and robots, and after 40 years of structural reforms of labour markets that aimed at strengthening the supply-side of the economy, we have the lowest growth in productivity since World War-II!



## 2. Attempts at explaining the productivity crisis

For supply-side economists who took over the economics faculties in 1980s and from then on dominated economic policy advisory bodies, the productivity slowdown is hard to understand. Essentially, one of their basic assumptions was that productivity thrives with better functioning markets. And supply-siders have really achieved several things to deregulate labour markets to make them function as real markets. For example, in many countries, a degree of downward wage flexibility was realized with the creation of a low-wage sector. This was made possible by a mix of measures that have been realized at varying degrees across countries. The latter included sobering of social benefits, easier firing (or a greater fringe of flexible workers in insider-outsider labour markets), weakening trade unions, more decentralized bargaining, or weaker coverage by collective bargaining agreements. And, finally, supply-siders succeeded for long periods to realize a level of 'natural' (or NAIRU-)<sup>1</sup> unemployment that was high enough to keep workers disciplined, thus favouring redistribution of income from labour to capital.

And after so many years of struggling to improve supply-side conditions for business, is productivity growth now going down the drain? This would be pretty much the opposite of what supply siders had expected (and promised). When theoretical expectation and empirical measurement are so clearly in conflict with one another, the first question that arises is: is the measurement correct? Or is productivity growth underestimated in the ICT age? Painstaking research has been done on this in the US. The unequivocal answer is: Yes, the productivity slowdown is real (Byrne et al. 2016; Syverson 2017). But how then to explain the productivity slowdown?

A convincing explanation of the slowdown was provided by Cette et al. (2015) and by Gordon (2016). Gordon describes in detail that, in ICT hotspots like Silicon Valley, there are now strongly diminishing returns on technological improvements. For example, numbers of start-ups have fallen sharply. And Moore's Law no longer applies either: doubling the power of a chip no longer takes 2 years (or less), but 6-8 years. Cette et al. (2015) show that the (high) contribution of ICT to total economy productivity growth, after 1994/95, has declined sharply since 2004/05 in major OECD countries. The production of ICT hardware is still the most dynamic sector within US manufacturing (Baily & Bosworth 2014); but ICT no longer triggers high total economy productivity growth.

Concluding, the observed productivity slowdown since about 2004/05 does not mirror statistical measurement problems. It is real. And the exhaustion of the ICT boom appears to be a valid explanation. Let us now come to another hypothesis: The productivity slowdown is not taking place *despite*, but *because* of deregulation of labour markets according to supply-side receipts.

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<sup>1</sup> NAIRU stands for 'Non-Accelerating Inflation Rate of Unemployment'. In its textbook version, NAIRU unemployment should be just high enough to prevent inflation-accelerating wage claims, i.e., it should guarantee a constant inflation rate (Shapiro & Stiglitz 1984). In practice, it has been an instrument for disciplining workers such that a redistribution of National Income in favour capital could be achieved. For a critical assessment of NAIRU theory, see Storm & Naastepad (2012).

### 3. An alternative explanation: better working markets work worse (for innovation)

Supply-siders had one key mission: Make sure that markets work better! If markets work better, everything works better. But unfortunately, as Schumpeter wrote back in 1942, if markets work better from a neoclassical viewpoint, they work worse from an innovation perspective:

*'Perfect competition ... is a condition for optimal allocation of resources ... But ... introduction of new methods of production and new commodities is hardly conceivable with perfect ... competition ... And this means that the bulk of ... economic progress is incompatible with it. As a matter of fact, perfect competition is and always has been temporarily suspended whenever anything new is being introduced ...'* Schumpeter (1942: 104-105).

At the time, in 1942, only few people may have fully understood the meaning of this quote. In the following, let me try to elaborate on it, making use of recent evolutionary research. In short, there is a trade-off between what is 'good' for the efficient allocation of scarce resources in a neoclassical perspective and what is 'good' for dynamic efficiency: innovation that makes resources less scarce.

Trade-offs between static and dynamic efficiency hold for various labour market rigidities that supply-siders were keen to eliminate. For example, in a neoclassical perspective, for fighting unemployment, we need downwardly flexible wages. In a labour market (just as in any other market) downwardly flexible prices (i.e., wages) allow for market clearing if there is more supply than demand. However, wage cuts are also a cause of low productivity growth. Vergeer & Kleinknecht (2011, 2014) show that a 1 percentage point lower real wage growth translates, over the medium term, into 0.32 - 0.46 percentage points lower growth of GDP per working hour. Hence, downwardly flexible wages come at a price: a slower growth of value added that can be distributed (extra) between capital, labour, and government.

The theoretical rationale is that lower wage cost pressure delays the diffusion of new process technology. In The Netherlands, this mechanism is captured in a widely accepted vintage model (Hartog & Tjan 1974). These models assume that the replacement of old vintages of equipment by new and more productive vintages depends on wages. Stronger wage increases make older machines more quickly obsolete and their replacement raises productivity (Hartog & Tjan 1974).

Incidentally, during past periods of high unemployment, this model was used for convincing trade unions to sacrifice wages: if old machines can be used longer due to low wages, there is less productivity growth and this is favourable for employment. Against the background of high unemployment, the objection that such a preservation of jobs is at the cost of problematic delays in modernization of equipment hardly got attention.

Besides delaying the diffusion of advanced process technology, downwardly flexible wages are a survival aid for weaker and poorly managed companies. If their workers are ready to sacrifice wages in exchange for keeping their jobs, such zombie-firms are less likely to be competed away in the Schumpeterian process of 'creative destruction'; and lack of sufficient creative destruction of zombie-firms will result in a weaker entrepreneur's population.

Finally, one can argue that low and downwardly flexible wages will favour the emergence of an industrial structure that makes ample use of low wages. For example, our Italian colleagues identify

a strong growth of the Italian 'cafeteria economy' as one of the causes of poor productivity growth in Italy (Pariboni & Tridico, 2019). The 'cafeteria economy' symbolizes low-productive sectors with poor technological opportunities for future productivity growth. More recently, Erken (2024) showed that there is a similar pattern in the Netherlands: The ongoing slowdown of productivity growth is reinforced by jobs shifting from high-productivity to low-productivity industries. One should note that low-productive industries also suffer from the 'Baumol-Cost-Disease' (Baumol & Bowen 1965). Examples of the Baumol-cost-disease are the hotel or restaurants industry, retail trade or personal services such as hairdressing salons, nail studios or (Baumol's favourite): performing arts. In fact, the productivity of musicians playing Beethoven's 9<sup>th</sup> symphony has not improved since the time of Beethoven. Rapid growth in such sectors is of course good for employment; but it retards productivity growth.

Besides achieving downward wage flexibility, under the banner of supply politics, there have been institutional reforms that varied across countries but had in common that they made, in one way or the other, labour more flexible and hence shifted power relations between employers and employees. From a neoclassical perspective, greater labour market flexibility is, in principle, a good thing for allocative efficiency. Meanwhile, there are, however, a number of empirical studies at company level, showing that more flexible labour relations correlate with four things: (1) with lower wages, (2) with lower productivity growth, (3) with a lower probability that an innovation will be realized or that R&D will be undertaken, and (4) with a significant growth of management bureaucracies.<sup>2</sup> As to the latter, Naastepad & Storm (2006) find that shares of 'managers' in the working population according to ILO definitions are substantially higher in *Liberalized Market Economies* than in *Coordinated Market Economies*.

The main arguments for a negative impact of structural labour market reforms on innovation and productivity growth can be summarized as follows:

- Easier firing leads to more 'dynamism' in labour markets, which is 'good' from a neoclassical perspective. Unfortunately, shorter job tenures also lead to lower commitment and loyalty to the company. Investments in company-specific training are then less worthwhile. Or learning-by-doing effects are poorly used. But lower loyalty can also mean that technological knowledge and trade secrets are more easily leaked to competitors. This can force companies to invest in supervision and control, thus creating larger management bureaucracies. The latter not only increase overhead costs, but can also harm the professional autonomy of creative people.
- With easier firing, (top) management becomes more powerful. Possible consequences are: more autocratic management, more 'me-too' cases, and a culture of fear. Acharya et al. (2010) show that easier firing enhances risk-aversion among the workforce. When looking for solutions to problems, staff then avoid riskier (but potentially more rewarding) options. Besides, people who fear for their jobs have motives for hiding information about how their work could be done more efficiently. This all implies that, once the labour market rigidity of protection against dismissals is abolished, management is likely to make poor use of knowledge from the shop floor. This is at odds with the emphasis in handbooks on innovation management that, for successful innovation, you should mobilize knowledge from all corners of the organization (e.g., Tidd & Bessant 2020).

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<sup>2</sup> For references see the survey in Kleinknecht (2020).

- A key concern of supply-siders is decentralization of wage bargaining. In a neoclassical view, centralized bargaining is a labour market rigidity. From a neo-Schumpeterian perspective, centralized bargaining has the advantage that it enhances the diffusion of advanced process technology: If bargained wage increases are imposed on *all* companies in the industry, this will force technological laggards to modernize equipment and/or their product offerings. In the case of decentralized bargaining at company level, laggards have an alternative to modernization: demanding lower wages in exchange for keeping jobs. If 'natural' (or NAIRU) unemployment is high enough, workers are more likely sacrificing wages.
- Finally, neo-Schumpeterian literature distinguishes two innovation regimes: regimes that require '*low* cumulative' and regimes that require '*highly* cumulative' knowledge for the innovation process (Peneder 2010). Examples of innovators using *low* cumulative knowledge are start-ups, but also several traditional industries and services. The latter use more frequently *general* knowledge that tends to be acquired externally. In contrast, in innovation regimes that require *highly* cumulative knowledge, knowledge is mainly developed and accumulated internally. Such knowledge often comes from the experience when working on improvements of products, processes, or systems. This internal knowledge tends to be poorly documented and is often 'embodied' by workers. It is sometimes referred to as *tacit knowledge* (i.e., 'intangible', or ill-codified knowledge; Polanyi 1966). Empirical research shows that flexible labour relations have a significantly negative impact on productivity growth and innovation among innovators who depend on a *highly* cumulative knowledge base. In *low* cumulative innovation regimes, however, harmful effects are smaller and often insignificant (e.g., Hoxha & Kleinknecht 2020, 2023). To conclude, long-term commitments to the firm in well-protected *insider* positions are a labour market rigidity in neoclassical theory, but are useful for innovation.

As was already indicated in the above Schumpeter quote, various standard concepts of neoclassical theory are problematic (if not irrelevant) in an innovative environment. An ideal market (i.e., *Perfect Competition*) assumes, among others: many buyers and sellers (nobody has market power); free entry and exit; adequate information for all market participants or strong property rights. Some of these assumptions, if ever realized, would even sabotage innovation. Lets us consider some examples.

In real life, successful innovators are mostly oligopolists, if not monopolists. Innovators need (the prospect of) monopoly profits to compensate for the risks and uncertainties of innovation. In other words, (expected) market entry barriers for imitators are a useful innovation incentive. In addition, innovators have a typical cost structure that demands exploiting economies of scale and thereby conquering large market shares: Initially, innovators incur very high fixed (and often sunk) costs for R&D, prototype development or preparation for production and market launch; thereafter, they enjoy rapidly declining marginal costs in the diffusion process. The innovation itself thus creates *imperfect* markets with large players – apart from the fact that innovation also thrives in such markets. Large companies also have the advantage that they can maintain an entire portfolio of innovation projects, thus diversifying risks. To conclude, innovation is incompatible with an atomistic market structure under Perfect Competition.

Or take the assumption of every market participant having adequate information. From a neoclassical perspective, incomplete information can lead to market failure. But a degree of

asymmetric information between innovator and imitator is useful for the innovator, as it delays the erosion of monopoly profits from innovation. And the (expectation of) more persistent monopoly profits increases the willingness to bear the risks of innovation, besides making it easier to absorb losses from failed projects.

Finally, assuming efficient property rights is also problematic. Technological knowledge has strong properties of a public good, with property rights hard to protect. Copyrights, trademarks or patents help to some extent, but they are also deficient in many respects. We could interpret provision of well-protected *insider* jobs as an investment by which companies 'buy' loyalty of workers and thereby limit the leaking of knowledge to competitors. An *insider* position might be interpreted as an implicit contract: you do your best for the company, and in return the company does its best securing your job. This implicit contract is breached with easier firing regulation, and that comes at a price.

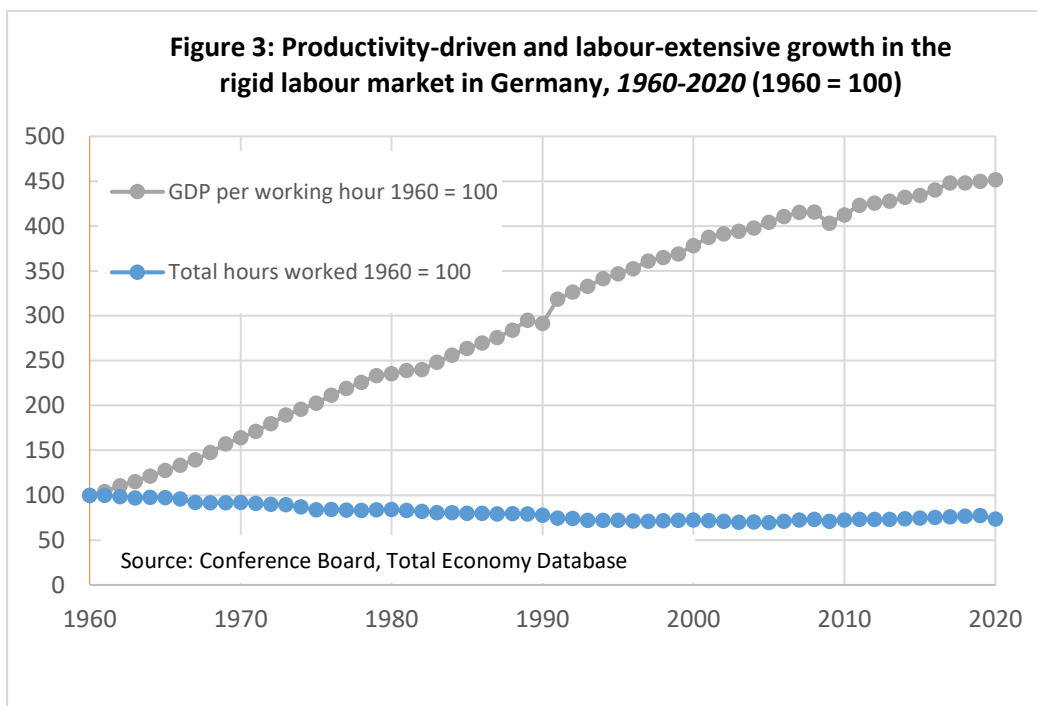
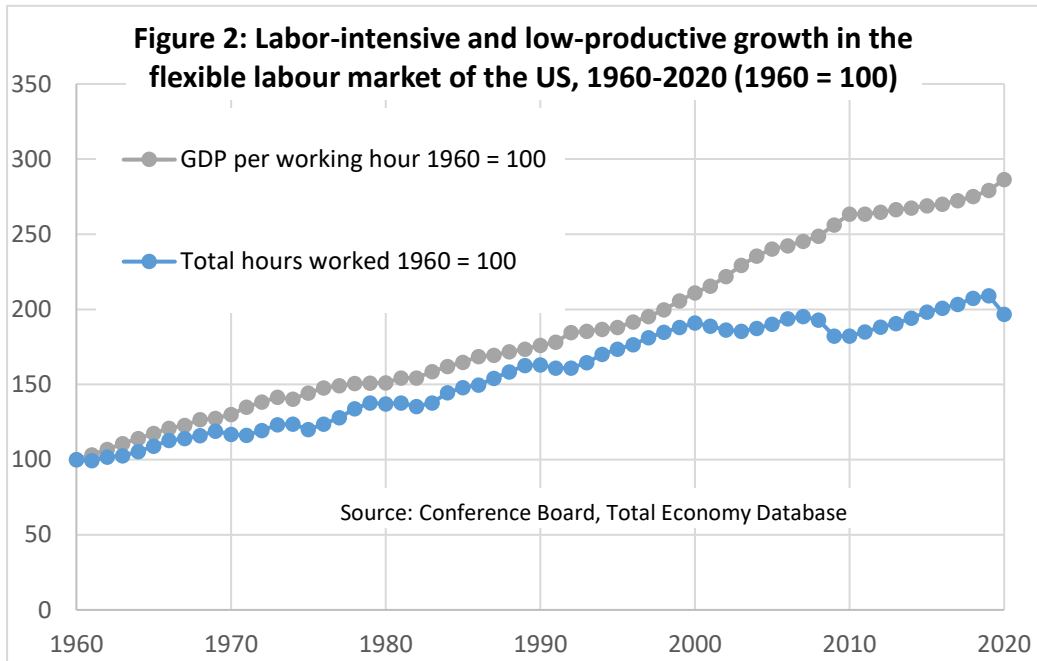
#### **4. Some consequences of the productivity slowdown**

As far as structural reforms of labour markets made labour markets work better from a neoclassical perspective, they made them work worse for innovation, and particularly for the innovation model that requires *highly* cumulative knowledge. A weak functioning of this innovation model will result in lower productivity growth and this means lower growth of income that can be distributed annually between capital, labour, and government; this makes it more difficult solving distributional conflicts, or financing a *Green Deal*, for example. An intensified battle for the division of the pie can increase inflationary pressure, but it may also support pleas for austerity.

The battle about income distribution can be exacerbated by a side-effect of low productivity growth: labour-intensive economic growth. Remember that an economy can only grow in two ways: either with *more* labour hours or with more *productive* hours. With disappointing productivity growth, one must therefore rely more heavily on a higher labour input if economic growth is to be sustained. But sooner or later, labour-intensive growth will tighten the labour market, which increases the negotiation power of labour.

The trade-off between productivity growth on the one hand and the labour-intensity of economic growth on the other can be illustrated in a comparison between the US and Germany. The US is emblematic of what Hall & Soskice (2001) call a *Liberalized Market Economy*, with deregulated and flexible labour markets; Germany (*before* its labour market reforms in 2002-5) is a good representative of Hall's & Soskice's category of *Coordinated Market Economies* with 'rigid' labour markets.

In Figures 2 and 3, all values are set to 1960 = 100. Labour productivity in Germany rises from 100 in 1960 to 450 in 2020, while US labour productivity remains below 300 in the same period. The mirror image of the productivity curves can be seen in labour hours: US economic growth required a doubling of hours between 1960 and 2020 (from 100 to nearly 200). In Germany, labour hours even *declined* from 100 to 78 (Figure 3).



No wonder the booming American 'job machine' has been used as a key selling point for structural reforms of labour markets under the banner of '*supply-side economics*'. In other words: let us strive for flexible firing, for downwardly flexible wages, for lower minimum wages or for poor social benefits. At first sight this is annoying for people, but in the end, it is precisely in the interest of the unemployed – it creates jobs!



Supply-side economists have repeatedly referred to *Euro sclerosis*: Old Europe, with its rigid labour markets, high wages, and strong unions, is unable creating jobs. Remarkably, in their discourse on *Euro sclerosis*, they have always carefully avoided mentioning productivity figures. Still, the productivity-driven German growth model (from before 2005) is preferable: Germans produced more with fewer hours, while Americans had to sacrifice lots of leisure time to achieve growth.

How is it that Germany did not have exorbitant unemployment, even though the total number of hours worked *fell* by almost a quarter after 1960, while, at the same time, many women and immigrant workers entered the German labour market? The answer lies in the reduction of working hours. The average number of working hours per employee per year in 1975 both in Germany and in the US was (coincidentally) equal to 1,813 hours. In 1995 this number had fallen to 1,531 hours in Germany, but has remained virtually unchanged in the US: 1,817 hours. In 2020, the ratio is 1,751 hours in the US versus 1,324 hours in Germany (The Conference Board, Total Economy Database).

Perhaps, it is one of the most important victories of the right, that the left, since the 1980s, has been discussing about unemployment, wage moderation and labour market reforms rather than productivity-driven (and thus labour-extensive) growth, accompanied by an adequate reduction of standard working times. After the labour market reforms of 2002-2005, Germany, under the influence of supply-side economists, abandoned the (intelligent) model of strongly productivity-driven growth in favour of a more labour-input driven growth. This low-productive but labour-intensive growth leaves two things to expect:

Firstly, with lower productivity growth, there is less to be (extra) distributed annually between capital, labour, and government. So, somebody will have to sacrifice income claims. The most plausible outcome is poor income growth (especially for lower incomes) and greater austerity pressure on the government.

Secondly, labour-intensive growth and a growing tightness in the labour market improve the bargaining power of labour. If a tight labour market results in higher wage cost pressures, this can accelerate the diffusion of advanced process technology, which could enable the country to switch back to a more productivity-driven economic growth. But there is still an important 'unless': Switching to faster productivity growth *can* happen, *unless* right-wing economists succeed in time convincing the Central Bank to raise interest rates, with the aim of depressing wages through higher unemployment. In this case, the country will continue a low-productive and more labour-intensive growth path.

Finally, it is a problem in this context that economists are used, for more than 150 years, to assuming innovation and productivity as 'exogenous'. This is now untenable. But, of course, this assumption has also been comfortable: if we know so little about innovation, then it probably is not that important. Given the ignorance about innovation, it is not realized that highly cumulative innovation regimes suffer from structural reforms of labour markets (e.g., Hoxha & Kleinknecht 2020, 2023). This leads to lower productivity growth, which increases the pressure for austerity, but also creates a tighter labour market in which wage demands can easily exceed (low) productivity growth, thus enhancing inflation.

If the latter happens, our *mainstream* economists will probably know nothing better than to revert to primitive methods such as the Volcker Shock of 1979: strangling the economy through high

interest rates (preferably supplemented with tight austerity measures), hoping that higher unemployment will ultimately depress wages. And this should make inflation manageable. There is, however, an extra problem to this: after the interest hikes, a weak wage growth reduces again productivity growth (Vergeer & Kleinknecht 2011, 2014), which makes the pie to be divided even smaller. This, in turn, can create additional inflationary impulses. But it can also increase public budget deficits that then require extra austerity measures. Thus, controlling inflation and government deficits by the anti-inflation hawks may become a lengthy and painful process. It is to be hoped that social-democratic parties in Europe will not (again) take responsibility for such policies. Electoral consequences may be tough.

Fortunately, there are intelligent alternatives. For example, reversing supply-side labour market reforms that frustrate innovation. Gradually tightening labour markets in the OECD offer opportunities for such a switch as they enhance the bargaining power of labour and increase wage cost pressure, thus enhancing the diffusion of process innovations. Higher productivity gains, in turn, can reduce the tightness in the labour market, but, above all, they also make the cake to be distributed larger. A larger cake to be distributed can reduce inflationary pressure and austerity pressure on the government and creates more fiscal space. Such extra fiscal space is urgently required: projects such as a Green Deal, or the rebuilding of the public sector after 40 years of supply-side policies simply cost some money.

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