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## Technological Change and Wage Polarization – The Illiberal Populist Response

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## Abstract

The purpose of this paper is to discuss populist actions that are expected follow technological change on the labor market.<sup>1</sup> The causes and consequences of possible technological unemployment will be addressed and to what extent it could be expected that the rapid technological change leads to unemployment (or that the labor market adapts in a similar way to previous technological changes as has been seen in history so far). A transforming labor market will constitute challenges for the future – possible wage polarization and heterogeneous distribution of unemployment in the labor force might create a demand for policy solutions that have an illiberal direction. In the paper it will be argued that the threat of populism will come from a disgruntled middle class rather than as commonly believed the poorer strata of the wage distribution.

*Keywords:* Technological change, unemployment, labor markets.

*JEL classification:* J20, J21, O10.

## 1 Introduction

In *No Ordinary Disruption*, [Dobbs et al., 2016] the industrial revolution is described as *a dance on roses* in comparison to the transformation phase the world economy is experiencing currently. Compared with the industrial revolution, today’s development is estimated to be ten times faster, the scale is 300 times larger and it gives roughly 3000 times greater effect. Even if these estimates are in the upper end of the ball-park the estimates does not change the fact that the labor market undergoes a rapid transformation when it comes to skill requirements, return on human capital and wage differences.

The aim if this paper is to shed light on what kind of changes on the labor market that has so far been seen in terms of wage polarization and structural changes. Furthermore, comments on possible responses from populists will be presented. In the paper it is showed that the economic explanation about why populism occur have some merit, even though some researchers have to some extent rejected it.

The structure of the labor market is always in turmoil, and economists are constantly trying to explain the current state of the labor market. Since the late 1980s, the labor market in most developed countries have become increasingly polarized in terms of wages [Acemoglu and Autor, 2011, Adermon and Gustavsson, 2015, Cortes, 2016]. The share of employment in high-skill, high wage jobs and in low-skill, low wage jobs has grown in comparison to the job share in the middle of the distribution [Goos et al., 2009, Goos et al., 2010]. At the same time there have been a larger increase in wages in the upper and lower part of the wage distribution compared to the middle with an ongoing debate about the consequences of a vanishing middle class (see e.g. [Temin, 2017], [Blanchard and Willmann, 2016] or [Mühlau, 2014]).

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There is a vast literature that has documented a noticeable rise in wage dispersion in the United States and in other countries commencing in the 1980s. Skill-biased technological change has been proposed as the primary cause [Autor and Dorn, 2013]. In [Autor and Dorn, 2013] it is hypothesized that job polarization will stem from the interaction between several different factors: consumer preferences, which favor variety over specialization, and the falling cost of automating routine, codifiable job tasks.

The remainder of the paper is organized as follows. In Section 2 present data and literature on the subject. Section 3 presents possible populist responses. Section 4 synthesizes the findings and discusses the results and summaries the key conclusions and outlines suggestions for future research.

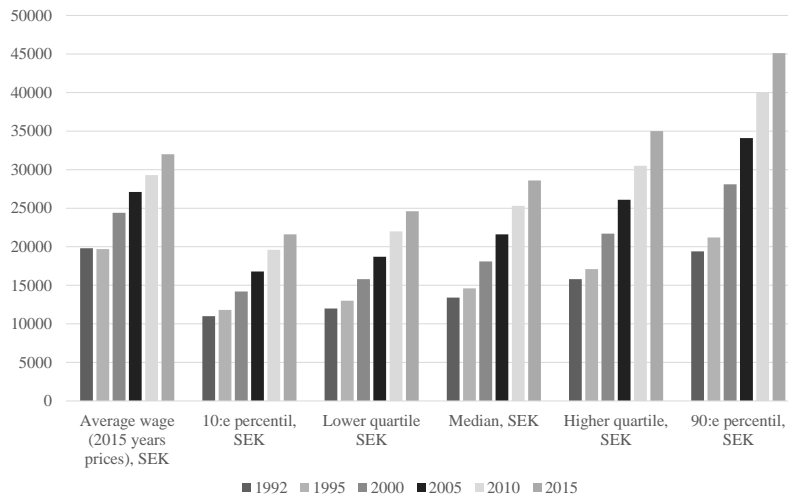
## 2 The State of the Economy

### 2.1 New Wage distribution

The explanation for changing wage distribution patterns has evolved over time. Earlier hypothesis focused on task-biased technological change (TBTC) - where long run technological progress reduced the demand for routine middle-wage jobs but increases the demand for non-routine jobs located at the tails of the job-wage distribution. The effects was seen on both low- and high-paying non-routine jobs. However, these predictions have not hold for all time periods (see e.g., [Adermon and Gustavsson, 2015] who found robust support for task-biased technological change, for the 1990s and 2000s but less so for other time periods). While there is significant growth of non-routine jobs and a decline of routine jobs, results for wages are mixed.

Looking at data from, for example, Statistics Sweden (SCB) the pattern that have appeared in most country are reveled (figure 1). We see wage development over time in all categories but a faster increase in the higher categories.

Figure 1: Source: SCB



The middle income occupations is losing-out relative to high and low paying jobs. Using harmonized European Union Labour Force Survey Data, [Goos et al., 2009, Goos et al., 2010] raised two important points with regard to a wage gap development. Firstly; in a majority, 15 of 16 European countries, for which data are available, high-paying occupations expand (with regard to persons in the work force) relative to middle- wage occupations in both the 1990s and 2000s. Second; *in all* 16 countries, middle-wage occupations contracted relative to low-paying occupations. These findings are also supported by for example [Adermon and Gustavsson, 2015] who studied job patterns in Sweden between 1975 and 2005. In [Goos et al., 2009] three hypothesis about the causes of wage polarization is presented:

1. The "routinization hypothesizes" (first presented by [Autor et al., 2003]) which suggest that technological progress tend to make it possible to replace "routine" jobs such as clerics and craftsmen, jobs in the middle of the income distribution.
2. Globalization and off shoring is changing the job structure in rich countries.
3. Job polarization might be linked to an increasing wage inequality. The rise in the share of income going to the rich have led to an increase in demand for low skilled jobs that revolve around providing services [Mazzolari and Ragusa, 2013].

As computerization erodes the wage paid to middle skilled worker (due to a fall of demand of them), middle-skill workers reallocate to the lower paying service sector. The output of low-skill service occupations carries some properties that have effect on the ability to charge money for them. Their output are non-storable (time not spent on giving service to someone is not creating any money) and non-tradable. Hence, suppliers and demanders of in person services must collocate to the same geographical location at the same time. For example, a report on an economic issue can be sold to several companies, and at different points in time, while a bus driver can only drive passengers once from point A to B at a given time-period.

In this paper no stance of whether or not a polarizing wage distribution is a normative good or bad is made. However, economists have identified some possible downsides with an increasing widening in income distribution. One such issue that has been raised is the possibility of a decreasing phase of economic growth (see e.g., [Atkinson and Piketty, 2007]). For a summary of the negative consequences of an increasing income distribution see for example [Franzini and Pianta, 2015], who found: i) a decline in marginal propensity to consumption and the accumulation of financial capital; ii) relevant socioeconomic aspects in terms of inequality of opportunities; and iii) reduction in happiness.

The literature on the causes and consequences of income inequality has been growing steadily over an extended period of time (see e.g., contributions by [Aghion et al., 1999] and [Piketty, 2014]). With empirical evidence revealing increasing income inequality both in advanced and industrializing countries dating back since the end of the 20th century.

The differences in what people earn every month can be separated into several different dimensions of income inequality. There is a distinction to be made between functional inequality (i.e. the division of income between capital rents and labor remuneration in an economy) and personal inequality (i.e. the income differences across households, regardless of the nature of their assets/holdings) [Antonelli and Gehringer, 2017]. The concept of personal inequality can be further refined into income inequality – where income refers both to wage income and to other income sources such as rents – and wage inequality (for a more precise discussion of the typology see e.g., the typology elaborated by [Aghion et al., 1999]).

## 2.2 Technology and Wage Polarization

According to [Antonelli and Gehringer, 2017] the Schumpeterian legacy shows that technological change affects income dispersion in several different ways. Technological change can theoretically lead to both a reduction in wage dispersion, but also have an effect rent dispersion. Innovations is expected to reduce wealth dispersion via the Schumpeterian concept of creative destruction where a large portions of the existing capital stock will lose its value when new innovations make it useless. A firm can have a “Kodak moment” where a new technology tumble an old market ([Sandstrom, 2011]).<sup>2</sup>

Simon Kuznets ([Kuznets, 1955] and [Kuznets, 1963]) path breaking work remains the basic reference in the economics of income distribution. In economics, a Kuznets curve graphs (among other applications) the hypothesis that as an economy develops market forces first increase and then decrease economic inequality. One example put forth by Kuznets: as a nation undergoes industrialization – and especially the mechanization of agriculture – the center of the nation’s economy will shift to the cities. There will be labor force migration where workers move to better paying jobs driving an income gap. Firm is expected to make profits in a faster rate than incomes are going up for an average worker. There were radical structural change on the labor market

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<sup>2</sup>In 1976 Kodak had 90 percent of the film market and 85 percent of camera sales in the US. They missed the digitalization wave an on 19th of January 2012 the filed for chapter 11 bankruptcy protection. Chapter 11 is a chapter of Title 11 of the United States Bankruptcy Code, which permits reorganization under the bankruptcy laws of the United States.

which lead to income asymmetry. Income inequality, however, eventually declines with completion of the industrial transformation.

When the industrial transformation is completed, the standard dynamics of economic growth will start a process leading to a reduction in income inequality. [Antonelli and Gehringer, 2017] illustrated the chain of events as following:

1. Savings increase as income moves upward leading to an increase in the supply of capital;
2. The excess savings decrease interest rate levels through abundance of capital;
3. Capital intensity increases as more per capita can be purchased;
4. Labour productivity increases (with the appropriate supply of complementary skilled workforce) and a need to man the new capital;
5. The higher productivity is then leading to higher wages that make a larger supply of savings possible.

Following this chain; as the economy get more advanced competition for manufacturing will drive away monopolistic profits due to competition. Moreover, in an advanced industrial economy (as studied by Kuznets), there will be tighter competition in product and factor markets. Following these factors, the standard mechanism of economic growth should reduce inequality (both income and wage) by means of a decrease in interest rates, a reduction in monopoly profits and an increase in wages. However, the relationship finds only partial support in the research literature and seems to be sensitive to the countries and time periods analyzed.<sup>2</sup>

Economic growth does not take place only via the traditional mechanisms that relate savings to capital intensity, labour productivity and wages (it traces its heritage to the classical Solow Growth Model ([Solow, 1956]), but also, and above all, via an increase in the general efficiency of economic activities stemming from the introduction of new technologies (e.g., [Barro and Sala-i Martin, 1992]; [Islam, 2003]; [Lucas, 1998]; [Romer, 1986]).

From the Schumpeterian view- point, a fast rate of introduced innovations make technological change magnified and empowers the negative relationship between economic growth and income inequalities identified by Kuznets. Schumpeter contributes to the Kuznets' hypothesis by confirming that economic growth, driven by technological change and disruption, exerts a positive effect on the reduction in income asymmetry in the long run.

[Antonelli and Gehringer, 2017] introduces four ways of how the rate of technological change affects the rent component of income (where the rent income from previous skills or capital creates inequality) distribution via four distinct mechanisms: A) the destruction of existing capital stock; B) the entry of new firms; C) the reduction in mark-ups and monopolistic rents paid as dividend to shareholders of incumbents; D) the increase in savings with a consequent reduction in the rates of interest paid to bond holders. Below the mechanisms will be further elaborated:

- A) The introduction of new technology creates disruption where old products and skills become obsolete or lose its value. With a wipe-out of large portions of the existing capital new entrants can move in and the value of skillsets is redefined. Owners of firms on the product market are forced out when their firms cannot compete with new entrants that erodes their customer base. Hence, the rate of technological change is thus likely to reduce (or reshape) the income asymmetries stemming from an initial uneven distribution of wealth.
- B) It has been showed that a large portion of radical innovations are generated mainly by newcomers rather than by incumbents. Considerable evidence confirms that radical innovations are generated mainly by newcomers rather than by incumbents. It has been showed that the emergence of new information and communication technologies and biotechnologies in the second part of the 20th century has principally been driven by entrepreneurship (as in the early [Schumpeter, 1934], rather than corporations, as in [Schumpeter, 1947]). A fast phase

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<sup>2</sup>The growth literature so far has shown that the rate of technological change is a key determinant of economic growth. This paper draw on an intellectual foundation from seminal contributions by [Schumpeter, 1947]. In Schumpeter's work ideas about an economy's creative response to changes in external conditions were presented. Furthermore, several analytical approaches have been applied historically to analyze the process of technological change, and a lot of inspiration from past works has been drawn from the extensive literature on induced innovation (primarily originating from, for instance, [Hicks, 1932], and [Arrow, 1962]), which later has come to play an important role for the analysis of technological development.

of technological innovation have been accompanying opportunity for the creation of new firms leading to economical upward mobility ([Aghion et al., 2015] and [Llopis et al., 2015]).

- C) With a high rate of innovation an increased market rivalry should occur and entry barriers can be expected to be lowered. Hence, excess profits are reduced and monopolistic rents that an incumbent can extract is falling ([Aghion et al., 2013]). Consequently, shareholder of old incumbent firms will get lower rents in terms of dividends. The entrepreneurs do earn extra profits when they are establishing themselves on the market and if their disruption is big enough can gain monopolistic profits. It has been noted that these entrepreneurs are seldom the offspring of wealthy families with old capital: they are rather rising from the middle class. Consequently, newcomers disrupts the existing economic structure and create a new stocks of wealth, decreasing the general levels of wealth inequality ([Link and Siegel, 2007]).
- D) Finally, new technology will change working conditions for the broad masses. Technological change increase total factor productivity and hence labor productivity. It also to some extent change the demand for skill and what skills are valued. Following increase in labor productivity wages increases, for those who maintain a job, increases. Higher levels wages, affect the absolute levels of savings and capital supply: with an increase of available capital interest rates gradually fall. The fall in interest should create a more symmetric distribution of income where the previous holders of bonds would lose due to a weakening share of income obtained by bonds.

### 2.3 Heterogeneous Job Distribution

In a paper from 2003 [Autor et al., 2003] (ALM) argued that technology is suitable to replace human labor in routine tasks – tasks characterized by step-by-step procedures or rules – but cannot replace human labor in non-routine tasks (at least not at that point in time they concluded). The rate (absolute) of technological change has developed rapidly the last 15 years in many fields which raises concerns about old truths. The routinization hypothesis could have accurately explained the situation at that given point in time it is not necessary the case anymore.

At the time when (ALM) put forth their hypothesis, *routine tasks* industries were dominating and those saw the highest adoption level of computers, resulting in a reduction of labor input. ALM also noted that many low skilled non-routine jobs were not affected by technological change to any large extent. Examples were housekeeping, hotel and catering and personal care, which are non-routine in nature but affected by technological change. The result was that the distribution of jobs is ‘*polarizing*’ with faster employment growth in the highest and lowest-paying jobs and growth in the middling jobs but not at the same speed and in some cases even shrinking rate.

In a paper [Adermon and Gustavsson, 2015] show that between 1975 and 2005, Sweden exhibited a pattern of job polarization with expansions of the highest- and lowest-paid jobs compared to middle-wage jobs.

There are several considerations when switching jobs, there is a wage cost associated of an occupational switch. Several studies have found that an important component of human capital is occupation specific. If the worker choose a different line of work a valuable human capital part can be lost [Kambourov and Manovskii, 2009, Sullivan, 2010]. For a more nuanced view see e.g, [Gathmann and Schönberg, 2010, Robinson, 2017] who suggest that human capital has an important task specific component and that the amount of human capital lost due to a switch of work is dependent on how similar the occupations were. According to [Gibbons et al., 2005]: workers select into occupations based on their comparative advantage. If their competitive advantage is weakened then they will have to move to another occupation where they probably have less of an advantage.

Over the last two decades there have been different lines of thought regarding the drivers of changing wages and employment. In the 1990s skilled-biased technological change (SBTC) was used to explain the shift towards more human capital intensive workers (see e.g., [Katz et al., 1999], for an overview). However, the development in recent years have cast some doubt about a uniform retreat from low skilled jobs. Instead there are signs of job growth in both ends of the skill spectrum. There has been a growth in high skilled jobs (e.g., professionals and managers) and in the low skilled part of the distribution (e.g., personal service), the decline have been in middle skilled jobs (e.g., manufacturing and routine office jobs) [David et al., 2006].

Top-paying jobs, usually, consist of tasks that require non-routine cognitive skills (e.g., engineers, economists), which should be complementary to computers or other capital goods. Adding and improving capital such as computers increases productivity. The lower end of the wage distribution usually, but not exclusively, consists of jobs with a high degree of non-routine manual tasks (e.g., cleaners, waiters, janitors), which cannot be made more productive with adding of computers or other capital since they are neither complements nor substitutes to computers.

## 2.4 Unemployment or adaption?

The expression technological unemployment refers to jobs that are disappearing due to improvements in technology. The expression was popularized by the economist John Maynard Keynes around 1930 but Aristotle also talked about people being displaced due to technologies. Technological unemployment can also be due to that new markets and demand for goods changes when new technologies are presented. Year 1920 there were 1,2 million coal-miners in Great Britain, in 2012 there were less than 5000 left. Productivity gains and new competing energy technologies reduced the demand for coal.

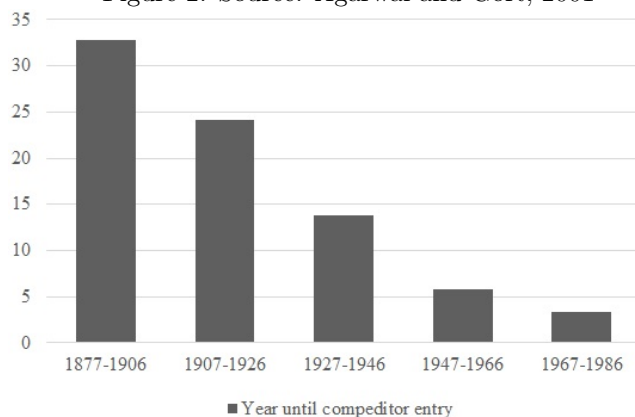
Table 1: 75% Adoption time. Source: Putnam (2001)

Invention	Private ownership (>1%)	Number of years until 75% household
Telephone	1890	67
Car	1908	52
Vacuum cleaner	1913	48
Refrigerator	1925	23
Radio	1923	14
Video	1980	12
TV	1948	7

When the story of the 20th century is being told most of the story will revolve around the new technologies that was introduced and the phase they penetrated the market. The phase was accelerating over time. While it took 67 years ( from the year 1890 >1% of consumers had it) for the telephone to reach more than 75% of the households the television needed only 7 years when it was introduced (>1% of consumers had it) in 1948 [Putnam, 2001].

For two hundred years, scholars have warned and worried about that the jobs will disappear faster than new ones are created. The scholars have been wrong, so far, but now that technological progress is faster than ever before, there is reason to believe that the prediction can actually fall into. Let's assume that this time it is different. This paper will not be first paper that raises the possibility that technological change will have profound effect on the labor market in several instances (and probably not the last that does). We know that horses with carriages was replaced

Figure 2: Source: Agarwal and Gort, 2001



by cars. The support infrastructure of the horse industry, e.g., blacksmiths, breeders, stable boys lost their jobs. However, a new supporting industry grew up with the rise of the automobile.

The blacksmiths and the stable boys become line workers at Ford or service personnel at gasoline stations. The time it took to introduce the car was not overnight, it was a long process with plenty of re-schooling time. For a long time there were both horses and cars on the streets.

In a study (see figure 2) covering the 46 biggest innovative products on the consumer market that has been introduced and later meet competition [Agarwal and Gort, 2001] found that the time before competition had arrived at the market has gone down rapidly. In the period 1877-1906 the average time was 32 years while in more modern days, 1967-1986 the time from innovation until a competitor made an entrance had shrunk to 3.4 years.

## 3 Who and how will the response be?

### 3.1 Who will respond

There are several hypothesis (not mutually exclusive) about the causes of populism<sup>2</sup>, one prevalent theory revolve around the economic factors – the economic insecurity perspective– which emphasize the profound and rather evident changes in the economy that are transforming the workforce and society in our post-industrial economies.<sup>3</sup>

In this section I will discuss some previous assumptions about populism pointing towards that they might be inaccurate with regard to the economic consequences. It is argued by for example by [Inglehart and Norris, 2016] that the economic hypothesis about populism is wrong since it has been showed that the lower strata of the labor population (and the very poor) are not supporting populist parties to any unusual extent. I will argue that; following the changes in the labor market it is not unexpected that the middle class is going towards populism.

It has been argued that economic variables are not strongly associated with the rise of populism (see e.g. [Ivarsflaten, 2005] [Inglehart and Norris, 2016]), hence reforms concentrated at appeasing and mitigating changing labor market situations (e.g., increasing employment and wages) might not appease the populist demands in either Europe or the United States. Furthermore, the two occupational groups most likely to vote for populist right parties in Western Europe in the 1990s had rather different opinions about the economic dimension of politics. The two groups were: blue-collar workers – who was prone to extensive state intervention – and small businesses owners who was rather unfavorable to state intervention in the economy [Ivarsflaten, 2005].

With respect to the economic hypothesis, [Inglehart and Norris, 2016] shows that the strongest populist support did not come from low-income individuals in the time period 2000-2014. Rather, the middle class tended to a larger extent be swayed by populists, people such as small business owners and self-employed technicians. It was showed that people who depend on social benefits were less likely to back populist parties (which might at a first glance be unexpected but I will later argue that it is not). Analysis of the European Social Survey 1-6 (2002-2014) showed that populist parties did indeed gather significantly greater support among the less well-off (reporting difficulties in making ends meet). However, in terms of occupational class, populist voting was strongest among the petty bourgeoisie, not unskilled manual workers. Looking at the really poor, people who received welfare to sustain their living, populists gathered significantly less support (not more). One explanation could be derived by considering how a risk averse individual might act.

If we consider a basic gamble with fair odds, it should not matter for an individual to take it or not but several individuals will not take the gamble. For example: a gamble with an expected pay-off of zero, consider a gamble that involves winning £2 with probability 1/3 and losing £1 with probability 2/3. The expected pay-off is  $(1/3)2 - (2/3)1 = 0$ . A fair gamble is said to have actuarially fair odds. A strictly risk averse person will not accept the gamble.

To further drive the point, if you play "heads or tails" the chance of winning is 50:50. If your original wealth level is 1000, then if 400 is at stake you end up with \$1400 when you win and \$600 when the coin falls on the wrong side. In a repeated game, on average your wins and losses are equal, and you're expected no change in your wealth level i.e. it stays at \$1000. Complicating this is that we don't care about money (think a billion Zimbabwe dollars) - we care about its purchasing power, something theoretically measured by utility. Since diminishing marginal utility

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<sup>2</sup>Populist party average share of the total vote in national and European parliamentary elections has increased since the 1960s, from around 5.1% to 13.2%, at the expense of center parties

<sup>3</sup>Alternatively, the cultural backlash thesis suggests that populist support can be explained as a reaction in the population to progressive value change.



is an assumption we make here and the consequence is that we assume that an increase in wealth gives us less additional utility, then the win in the gamble would not give us enough utility to offset the loss.

To calculate a consumers expected value of a gamble as in equation (1) we just look at equation (2) presented below (for a more in depth discussion see [Varian, 1978]).

$$p * X \oplus (1 - p) * y \tag{1}$$

$$pu * X \oplus (1 - p)uy \tag{2}$$

If graphing these we see that a risk averse individual would prefer to get the expected value of the gamble. That is, the utility if the gamble  $u(X \oplus (1 - p) * y)$  which is less than the utility of the expected value of the gamble,  $pu * X \oplus (1 - p)uy$ . If we, as seen previously have two types of workers. Type *A* is a mid-income worker who is in fear of losing income but have a chance at winning the lottery and obtaining a high paying job. The worker of type *B* will be in a low paying job where the prospect of going down any more is not big and the likely outcome is that they will climb to some extent if their pool of job is increasing due to some previous on the job experience. To illustrate that worker *A* is more risk averse we can formalize some notions about their respective utility functions. Assume utility function  $A(w)$  is more risk averse than an agent with utility function  $B(w)$  then it is required that

$$-\frac{A''(w)}{A'(w)} > -\frac{B''(w)}{B'(w)} \tag{3}$$

For all levels of wealth then type *A* will have a higher degree of risk aversion than type *B*. Type *A* will even be willing to pay an insurance premium. I.e. incur a loss in order to avoid taking a bigger loss. Hence, one might vote against what is in ones interest (but it could be somewhat informed decision) in order to not loose more.

As seen in section 2, the lower end of the wage distribution is increasing in jobs and the demand for that kind of service are also increasing hence putting a small pressure upwards on wages. Considering this the lower stratas of the distribution are not at risk of loosing anything (or much).

### 3.2 A parallel to history

There are long historical roots for the argument that populism reflects rising or changing socioeconomic situations within affluent societies. E.g. [Lipset, 1960], associates it with the rise of fascism in Weimar Germany, Poujadism in France, and McCarthyism in the United States.

Each of these movements found support mainly among the petite bourgeoisie - - small entrepreneurs, shopkeepers, merchants, self-employed artisans, and independent farmers - these traditional middle class people was seeing their place in society deteriorate. They face competition from the growing dominance in economic affairs by big business and the rising organized labor.

Hence, in Weimar Germany one explanation for the rise and takeover of Nazism can be people stimulated by fears of downward mobility and loss of social status who acted to lose as little of it as possible. Furthermore, fascist parties and extremist movements were thought to tap fears and insecurities among those who lost out to industrialization. As argued by Lipset and Bell: "Extremist movements have much in common. They appeal to the disgruntled and psychologically homeless, to the personal failures, the socially isolated, the economically insecure, the uneducated, unsophisticated, and the authoritarian persons." (p. 175) [Lipset, 1960]

Hence, as previously mentioned [Inglehart and Norris, 2016] reject the economic insecurity thesis (to some extent) as explanation and mean that populism is not a product of growing income inequality and dissatisfaction among the losers from global markets.

Arguing that:

"If the economic insecurity thesis is correct, the logic predicts that mass support for populism should be observed to be concentrated among economically marginalized sectors who are the main losers from global markets, technological advances, and knowledge societies. Thus populist votes should be strongest among unskilled workers, the unemployed, those lacking college degrees, house-holds dependent on welfare benefits as their main source of income, and those living in inner-city urban areas, such as in

London, Paris, Amsterdam and Munich, which typically attract some of the highest concentrations of foreign-born residents.” (p. 12)

Furthermore, they argue that:

“Populist support should also be predicted by subjective feelings of economic insecurity, such as among those reporting difficulties in making ends meet.” (p. 12)

Drawing historical parallels is always dangerous (and in a more developed paper some empirical part will be added). But if we allow our self to draw a parallel to another (temporary) successful populist movement, if it should be called populist is the NSDAP’s (the Nazis in Germany). They struggled to get votes in large urban centers. In July 1932, the support in the Grosstadte (over 100,000 inhabitants) was 10 per cent lower than the national average. The support among workers was growing but was not significant and among the workers that supported them a large part came from villages with under 5,000 inhabitants [Geary, 1998].

The party were able to gain followers and support in small provincial towns and rural areas more effectively than in the large cities. Beside the urban/rural divide the Nazis were relatively unsuccessful in gaining support from the unemployed, who were also concentrated in Germany’s largest cities.

The German Mittelstand (lower middle class) of small businessmen, independent artisans, small shopkeepers and the self-employed, to the threats coming from big business and large retail stores, from the trade unions, other political parties, and from perceived government interference and taxes to pay for Weimar’s spending.

The vanishing middle class debate is ongoing (see e.g. [Temin, 2017], [Blanchard and Willmann, 2016] or [Mühlau, 2014]). If the middle class is shrinking is a debatable subject but there is not a lack of academic work pointing on a weakening of the middle class in recent years. Technological change might once again affect the lives of the lower middle class and we should not be surprised if there is some reaction.

## 4 Conclusion

The objective of this was to investigate the presence of a changing labor market and identify who is going to bear the brunt of the forces of change. The evidence points at that the middle class of the distribution are those who are most in danger of losing jobs and status due to technological change.

Some responses that might occur is discussed and some historical parallels are drawn (that have to be retested and thought about more in a later version of this paper).

The results of this study also point to the need for further research on the driving forces behind divergence wages and job distribution due to technological development efforts. Without such knowledge, it will be hard to identify suitable strategies to ensure an efficient transition to a new labor market.

When data and empirical tests are performed then more conclusions can be drawn.

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## 5 Appendix

In figure 2 the changes in European labor force is showed.

Figure 3: Source: The European Union Labour Force Survey (EU LFS)

Education level	Percentage point change over 2000-2016
Tertiary education (levels 5-8)	0,7
Upper secondary and post-secondary non-tertiary education (levels 3 and 4)	1,1
Less than primary, primary and lower secondary education (levels 0-2)	-4,9
Total	3,8