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IMPACT OF CHANGES IN HUMAN CAPITAL POTENTIAL ON MACROECONOMIC TRENDS

Abstract

A decline in labour force and wage cuts are among the factors that determine macroeconomic trends. Since workers are normally motivated by significantly higher wages in other companies, these factors can reduce labour mobility. Moreover, we are witnessing trends related to the share of labour force, capital and output growth. This paper supports the thesis according to which these trends are rooted in the increase of the market power starting from the 1980s.

Furthermore, this paper analyses the development of the margins using the company-level data in the USA economy from the1950s on. Initially, the margins were stable, or on a slight decline. Average margins had an increase of 18% above the marginal cost in the 1980s compared to the 67% growth that we are witnessing nowadays. There seems to be no clear pattern identifiable across the industries, but the margins tend to be higher in smaller companies in all industries and the higher growth is usually registered as a result of growth within an industry.

Keywords: Margins, macroeconomic trends, market power

1. Introduction

In the following sections we will point to a connection between the market power and a couple of trends observable in the aforementioned period of time.

A market force can be defined in more familiar terms such as margins. Even though the equality of the terms is quite disputable, let us assume they are identical, to facilitate the understanding. Based on company-level data in the period 1950-1980 the level of margins/market power was more or less constant. However, from the 1980s to the present day there has been a steady increase in the market force, from 18% above cost to 67% above cost, which means an increase in the price level in relation to the cost of 1% per annum. Secondly, by studying the macroeconomic implications of an increase in the market power we gain an understanding of its effects and consequences on the overall balance as well (Baily, Bosworth, 2014).

Margins are usually estimated based on assumptions about the consumer behaviour combined with profit maximizing and a projected model of how companies compete, for instance the Bertrand-Nash model of pricing.

The main problem that this approach encounters is the fact that marginal costs of production are not constant, which makes it harder to extract them from the data available. Thus, the optimum pricing connects data on prices observed with the estimated elasticity of the substitute in order to get to the marginal cost of production and margins themselves. The combination of the need for consumer demand data (containing prices, amounts, properties, consumer characteristics etc.) and the need to establish a behavioural model has limited to usage of the so-called access to the demand on specific markets (Baqaee, Farhi, 2017).

This paper follows a radically different approach to margin estimating, the so-called production-oriented approach, taking into account the latest advances in the literature on margin estimating in the work of De Loecker and Warzynski (2012). What makes the De Loecker and Scott approach unique is the fact that it relies on the data on input and output of particular enterprises taking into account an observed group of consumers in a certain time period, and presupposes a cost minimization by the manufacturer. Margins are calculated for each manufacturer in a certain time period, as well as the difference between the share of variable revenue input in revenue (observable in the data) and the elasticity of production. The latter is estimated in association with production functions (Jovanovic, 1982). The advantage of this approach is that it can be referenced to publicly available sources providing the data on production. Even though there are still problems regarding the estimation and the subsequent econometric challenges, there seems to be no alternative way to progress (De Loecker, Scott, 2016). This method makes it possible to discover the main pattern in market power over the course of a longer period and within the global economy.

This analysis is interesting and very significant on its own given the fact that the economic models are allowing for substantial variations of margins in relation to manufacturers and time, and by allowing such variations of company/time it implies a whole range of significant questions on different issues.

After we determine the principal facts, we take them as the assumption on basis of which we then discuss the implications of the growth of the market power forming the latest discussions in macroeconomics/work literature. Margin growth is taken as a given fact and we do not go into the analysis of how it takes place, which is something that could be dealt with in a separate paper, even though we do provide the reader with a couple of promising explanations in the concluding remarks. We are paying special attention to how the margin growth naturally leads to a decrease in the share of the workforce and the share of capital, wage cuts for the low-qualified, and the overall reduction of labour force (Hyatt, Spletzer, 2013), as well as reduction in work flows and interstate migration. Finally, we are able to demonstrate that a valid explanation of marginal growth does not involve a decrease in productivity, but rather the opposite, despite the fact that the output growth is slowed down.

2. Margin estimation

It is a general fact that margin estimation is a difficult task because the data on marginal costs, especially on pricing on a large representative sample is not easily accessible.

We rely on the recently proposed framework by De Loecker and Warzynski (2012), based on Hall's idea (1988) about margin estimation (on a company level) using standard data on companies from balance sheets, which does not require creation of assumptions on demand and mode of market competitiveness. Instead, margins are calculated using minimizing the cost of variable input of production. This approach calls for explicit use of the production function.

2.1 Behaviour of manufacturers

Let us imagine an economy with N number of enterprises, with the index i = 1,...,N. Enterprises are heterogeneous in their productivity and have access to a joint manufacturing technology. In any time period z, enterprise m reduces simultaneous production costs taking into account the production function that transforms inputs in the amount of output Q_{mz} produced by technology O(·):

$$O(\Omega_{mz}, P_{mz}, I_{mz}) = \Omega_{mz}\, F_z\,(P_{mz}, I_{mz})$$

Where $\boldsymbol{P} = (P^M, \ldots, P^J)$ is a set of variable inputs of production (including work, intermediary input, materials...), I_{mz} is the basic capital and Ω_{mz} is Hicks' neutral productive member specific to an enterprise. Since we are about to use information on the set of variable inputs rather than individual inputs, in the exposition, the vector P is treated as scalar P. Following De Loecker and Warzynsky (2012) we observe Lagrange's objective function connected to it:

$$\mathcal{L}(P_{mz}, I_{mz}, \Lambda_{mz}) = C^P_{mz} P_{mz} + t_{mz} I_{mz} - \Lambda_{mz}(o(\cdot) - O_{mz}$$

Where C^P is the price of variable input, t is the cost of ownership of the capital, $O(\,)$ is the technology (1), O_{mz} is scalar, and Λ_{mz} is Lagrange's multiplier. We are considering the first order condition in relation to variable input P, in the following way:

$$\frac{\partial \mathcal{L}_{mz}}{\partial Pmz} = C^P_{mz} - \Lambda_{mz}\frac{\partial O(\cdot)}{\partial P_{mz}} =$$

Multiplying all members with P_{mz}/O_{mz}, by transforming the equation, we get to the form of elasticity of production for input P:

$$\theta^P_{mz} = \frac{\partial O(\cdot)}{\partial P_{mz}} \cdot \frac{P_{mz}}{O_{mz}} = \frac{1}{\Lambda_{mz}} \cdot \frac{C^P_{mz} \cdot P_{mz}}{O_{mz}}$$

Lagrange's parameter Λ is a direct measure of marginal cost, that is, the value of an objective function while we allow the limitations of the output. We define margin as $\mu = \frac{C}{\Lambda}$, whereas the product price is C, which depends on the extent of market power. In further text we come back to that again. By replacing the marginal cost with the relation between margins and prices, we get a simple formula for margin:

$$\mu_{mz} = \theta^P_{mz}\frac{C_{mz}O_{mz}}{C^{Pj}_{mz}P_{mz}}$$

The formula for margin is derived without determining the behaviour and/or particular demand system. It should be noted that with this approach to margin estimation, there are, in theory, several first-order conditions (from each variable input in production) that provide a formula for the margin. Regardless of which variable input is being used, there are two key factors required to estimate the margin: the variable input share $\frac{C^P_{mz} \cdot P_{mz}}{C_{mz} \cdot O_{mz}}$ and elasticity of production of variable input θ^P_{mz} . Even though this approach does not limit the elasticity of production, in the implementation of this procedure consistent estimation of elasticity from the data depends on the specific production function and assumptions on the consumer behaviour. In further text we deal with the implementation.

2.2 Implementation

We observe the sales directly $D_{mz} = C_{mz}O_{mz}$, , as well as total variable costs of production $T_{mz} = \Sigma_j C^{Pj}_{mz} P^j_{mz}$, measured on the basis of the cost of a sold product. Compustat data do not show directly an overview of expenses for variable input such as labour, intermediary input, electricity etc., so we are more inclined to rely on the registered total variable expenses of production. Calculation of margins requires an estimation of elasticity of production of this set of input. We follow the standard practice relying on a group of companies estimating their production functions by industry. We pay special attention to different production function specifications, on the economy level, but also on the industrial level. When it comes to end results, we take into consideration Cobb-Douglas production functions for a specific industry, with variable input and capital.

When it comes to particular industries, the production function is observed in the following way:

$$\mathbb{Q}_{mz} = \beta_p p_{mz} + \beta_i i_{mz} + \omega_{mz} + \epsilon_{mz}$$

Where lowercase represents logarithms and ω_{mz} = *ln* Ω_{mz}, and where q_{mz} is measured as a logarithm of reduced sales of a company. We are considering literature and control of the bias when it comes to selection and simultaneity, which is inherently present in the estimation of the equation above and we rely on the control function approach paired with the AR(1) productivity process in order to estimate the elasticity of production of variable input, marked here as β_p (Antras, 2004). The main characteristic of this kind of approach, in the context of our research, is that the control function approach rests on the equation of optimum input demand; which is an immediate effect in the cost minimization used to formulate margin expression. More importantly, Olley and Pakes (1996) have concluded that the (unobserved) ω_{mz} productive member is obtained by the function of the enterprise input and control variable, which, in our case, corresponds to the set of variable input, making ω_{mz} = h (pmz, imz).

This approach is based on the so-called two-fold access, and during the first phase of measurement errors and unexpected shocks of sales are removed in the following way:

$$\mathbb{Q}_{mz} = \emptyset_z(p_{mz}, i_{mz}) + \epsilon_{mz}$$

where ϕ = $\beta_p$pmz + βiimz + h(p_{mz}, i_{mz}). Process of productivity is obtained in the following way: $\omega_{mz} = \rho\omega_{mz-1} + \varepsilon_{mz}$, and this leads to the following state of the moment of formulating the elasticity of production for a particular industry:

$$\mathbb{E}(\mathcal{E}_{mz}(\beta_p)p_{mz-1}) = 0$$

where ε_{mz} (β_p) is obtained using β_p, projecting productivity $\omega_{mz}(\beta_p)$ to its delay $\omega_{mz-1}(\beta_p)$, where productivity is obtained $\emptyset_{mz} - \beta_p p_{mz} - \beta_i i_{mz}$, using ϕ estimation from the first phase of sale regression on nonparametric function of variable input, capital and annual indicator variables. This approach identifies the elasticity of production of variable input under the assumption that the deployment of variable input responds to shocks of production, but that the lagged values do not correspond, and, more importantly, that deploying the lagged variable of input correlates with deployment of a current input variable, which is guaranteed by productivity persistence.

We measure the margins on an enterprise level using the estimations of elasticity of production.

$$\mu_{mz} = \beta_p \frac{S_{mz}}{T_{mz}}$$

As discussed in the work of De Loecker and Warzyinski (2012), we have corrected margin estimations in relation to the presence of a measurement error in sales ϵ_{mz}, obtained in the first phase of regression.

3. Macroeconomic implications

We analyse the macroeconomic implications of the growth of market power. Some implications call for further data analysis (Barkai, 2017)1, data used in margin calculations, and as far as other implications are concerned we have developed a simple static model of competitiveness in the industry in order to illustrate how market power can generate notable outcomes.

More precisely, we will briefly sum up the heterogeneities observable from the data.

Implication 1. Secular decline of the labour force

In national accounts, the share of the workforce in the income determines the expenditures (wages) divided by total generated income. Even though there is fluctuation in business cycles, the workforce share was notably stable since World War II till the eighties, approximately 62%. From 1980 on there has been a secular decline to 56%. The decline is observable in most industries and in different countries (see Karabarbounis, Neiman, 2014; Gollin, 2002).

Economists did not come up with convincing evidence of a mechanism for reduction of the workforce share (Noe et al., 2014). There are, however, several explanations. Karabarbounis and Neiman (2014) assume that a great deal of decline can be explained by reduction in relative prices of investment goods due to information technology. An alternative explanation would be the composition of production and services. Production usually requires a larger part of the workforce than services (Acemoglu, 2010; Ziliboti, 2001); therefore, it is only natural that the labour force will drop with a shift occurring when industry is switching from production to services. However, this switch does not coincide with the period of decline of the workforce. As a matter of fact, the largest part of the transition from production to services took place before the 1980s (between 1950 and 1987 the share of production in the output has dropped from more than two thirds to less than a half, whereas the service sector has doubled, from 21% to 40%, but that transition has been slowing down since 1987, see Armenter (2015).

Zheng et al. (2017) offer another explanation based on the greater importance of immaterial capital and its incomplete measurements as a part of capital in aggregate data. Enterprises now invest much more into intellectual property products, which leads to lower production cost. However, in their world of perfect competition, this measurement problem should not lead to an increase of the total profit share. As we have stated previously, a fourfold increase of the total profit rate points to the fact that immaterial possessions play an increasingly important role. They have to enable enterprises to use as much market power as possible, which is the central thesis of our paper. Finally, Elsby et al. (2013) provide no evidence that capital is being replaced by workforce, nor that the explanation lies in the decline of the trade union. They do provide evidence for the off-shore hard work as an explanation.

In the context of our thesis, margin change has an immediate implication for the share of the labour force. Having calculated the margins with the help of all variable inputs, we can do the same for the work itself. Therefore, we shall, starting from the first order condition (5) discover that on the enterprise level, the labour force share $\frac{\omega R}{CO}$ satisfies:

$$\frac{\omega R}{CO} = \frac{\theta_R}{\mu}$$

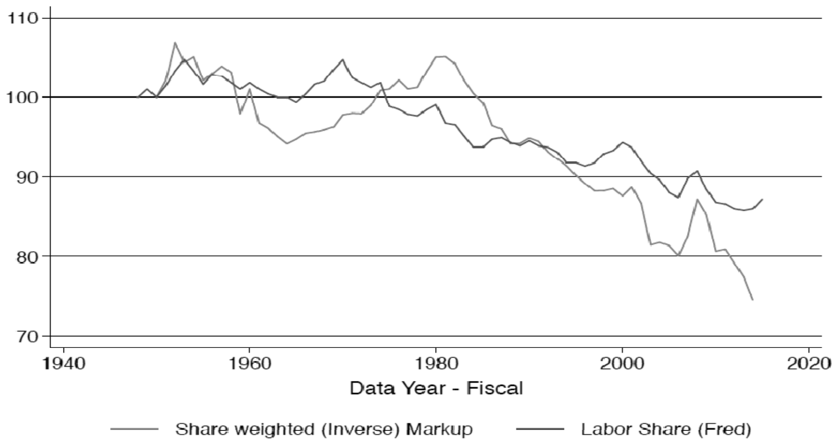
where θ_R is the elasticity of production in relation to labour. Profit maximizing in individual enterprises implies a reverse proportional change of the labour force share. As the margin grows, and on condition that the technology parameter θ remains unchanged over time, we expect a reduction of the workforce share.

Unfortunately, Compustat does not have quality data when it comes to wages. Hence, we cannot directly check the condition on an enterprise level. Instead, we rely on the aggregate data from BLS. They publish the total employee compensation (wage expenditures) as a part of gross domestic income. We compare these BLS measurements with the average population from the right side of the equation (1), assuming that the technology parameter has remained unchanged.

As a margin value we use the one calculated on the basis of total variable costs (COGS), and not the work cost because we lack reliable data on the wages. This is shown in Figure 1, in which we have normalized these values on 100 at the beginning of our data in 1950 (Harberger, 1954).

Our main conclusion is that the labour force share (in green) closely follows the reverse margin, especially since 1980. It seems that the workforce share has been going through a slower decline than the reversed average margin, but the trend is very similar. The fact that this aggregate measurement of the workforce follows the reversed margin is quite outstanding because we are implicitly making these assumptions, due to a lack of data on the wages on an enterprise level (Thompson et al., 2008).

Figure 1 Evolution of the workforce share (BLS) and reversed margin (1960-2014)



Notes: Data on the labour force from BLS. Share in the gross domestic income: Employee benefits, paid: Salary calculation. Payments, people. 1950 = 100.

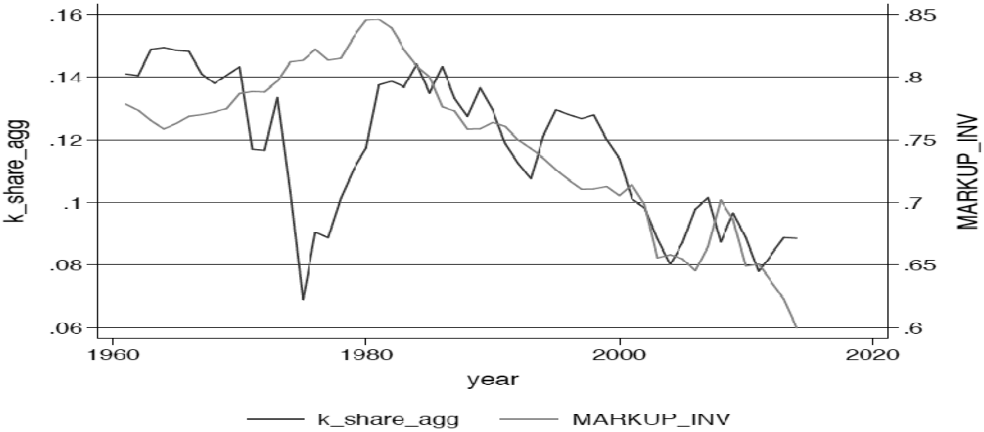
Source: De Locker, J. (2017), "The Rise of Market Power and the Macroeconomic Implications"

In theory, all workers were treated as equals in a company given the fact that we only had one margin measurement per company and that our model assumes that workload is adjusted only to the number of employees, and not the composition (Higgins, 2014; Higgins, 2007; Higgins, Cohen, 2007). Moreover, margin μ_m in each company is calculated on the basis of all variable inputs (work inputs R and material inputs U) where the first order condition (18) should apply to margin calculated only in relation to work. The bond between reduction of the workforce and the growth of (aggregate) market power is robust according to specific weights used to formulate aggregate margin index (Moll, 2014).

Implication 2 Secular decline of capital

The logic for the decline of the workforce applies to material U, that is, variable inputs used in production. These are included into our measurement of the variable cost of COGS. By taking into account the evolution of capital investments, which is not included in our measurements of variable expenses and which is adjusted on a lower and longer-term frequency than the margin growth, there are implications for the capital share. While there is a lot of discussion on the reduction of the labour force share, the reduction of capital has been paid much less attention. Using a simple accounting rule, we can formulate the sales of a company as: $\mathbf{CO = C^{P}P + tI + A}$, where t is the cost of ownership of fixed capital and A is the total profit.

Figure 2 Evolution of capital (our calculations) and the reversed margin (weighted by sales share) (1980-2014)



Notes: Data on equity, personal calculations (from Compustat). Gross capital (PPEGT) adjusted to the Input Price Deflator (PIRIC from FRED), federal funds rate and exogenous deprecation rate of 12%. 1980=100

Source: De Locker, J. (2017), "The Rise of Market Power and the Macroeconomic Implications"

Even if the equity is not adjusted on an annual basis, on average, over a long period of time, the cost of capital ownership tI as a part of the output will develop. If the market power and profit grow, companies not only reduce the labour force share but, over a long period of time, reduce the capital too $\frac{tI}{CO}$. Whenever the capital is adjustable, maybe over a span of a couple of years only, it will be done in accordance with the first order condition $\frac{tI}{CO} = \frac{\theta_I}{\mu}$. Then we can formulate the following:

$$(\theta_P + \theta_C)\frac{1}{\mu} = 1 - a$$

where we bring together all variable inputs into P and, using our Cobb-Douglas type of technology, and θ_P and θ_I are the cost shares and, where $\theta_P + \theta_I = 1$ and where $a = \frac{A}{CO}$ stands for a total profit rate.

Implication 3 Secular decline of the low-qualified labour force

For the following four implications – decline in wages of low-qualified labour force, decline of the labour force share as well as reduction in the work and migration flows – we later describe the model used in order to estimate margins. In other words, margin estimation and the key facts related to it and its implications are founded only on cost minimization, whereas additional assumptions on the market structure, consumer behaviour and demand only reflect that (Arrow et al., 1961).

Let's assume there is a measure l of the market, and each includes N companies. Each market is marked as Ω, which points to a level of productivity of each company on the market. Companies are equally productive within each market. In the general economy, the distribution Ω is *F*(Ω). In the general economy there is a measure M for unskilled workers. Workers are indexed by qualification z expressed in the units of efficiency and allocated according to *G(z).* All workers share a common external ability U. Labour market is competitive and a balanced wage is marked as w.

Due to a final number of companies on a particular market, each company has a certain market power, hence, according to Bresnahan (1982) we formulate the behaviour in determining the price of limit cost in terms of "behaviour parameter". With regard to marginal cost c, the decision on pricing on the market Ω is:

$$C(O) = t + \lambda h(0)$$

Where *Om* output of a company m, O = Σ_m, *Om* functions as market output, and $h(o) = -\frac{\partial C(O)}{\partial (O)} O$ displays some of the characteristics of the elasticity of production. In the case of linear demand *C (O) = a – bO*, for instance, *h(O) = bO.* Term λ is the behaviour parameter, which measures the market structure. For instance, in Cournot's model, *λ* equals the reverse number of companies N on the market. In perfect competitiveness, as N proceeds to infinity, so λ drops to zero, and in monopoly, if *N* = 1, then λ = 1. It can also measure the extent of consumers' loyalty (Burdett, Judd, 1983).

Our margin $\mu = \frac{C}{t}$ measure can be formulated as:

$$\mu = 1 + \lambda \frac{h(O)}{t}$$

This makes the possible reason of margin growth highly transparent. Firstly, if a company increases its productivity (reducing the marginal cost t), and other companies do not do the same, then margins increase due to higher efficiency. This cannot be a long-term outcome, however, because the other companies will adapt to the technology. Secondly, if the elasticity of demand decreases, this is formulated by an increase in g(O). Thirdly, if the behaviour parameter λ increases, market power of a company grows, and the margins follow. Although factors listed could all be the cause of margin growth, we will be focusing on the change in parameter λ in order to reflect the noted growth of parameter *μ*. Reduction of parameter t in any given company should lead to the same trend in other companies, either because they are also embracing new, cheaper technology or because they are being pushed out of the market. Naturally, preferences (and with them even h) can transform and change, but it is quite unimaginable that they would change so dramatically as to match the growth of the market power in a period of a couple of decades.

The company goal is to select an amount of work R_i to maximize the profit:

$$\max_{R_m} C(O) O_m - \omega R_m$$

where $O_m = \Omega_m R_m^{\theta}$. Then the first order condition reflects the market structure, and, in accordance with the rules of conduct satisfies *C(O) — λh(O) = t* where $t = \omega \frac{\partial R_m}{\partial O_m} = \frac{\omega}{\Omega\theta} R_m^{1-\theta}$ is a marginal cost. Then

$$C = \frac{\omega}{\Omega\theta} R_m^{1-\theta} + \lambda h(O)$$

where $h(O) = -\frac{\partial C}{\partial O} \cdot O$. In the case of Cournot's model of linear demand *P = a — bO*, and, when it comes to similar companies, the first order condition (FOC) (24) can be formulated as:

$$a - (1+\lambda) bO = \frac{\omega}{\Omega\theta} R_m^{1-\theta}$$

Consider the case in which *θ* = 1. Then $O_m = \Omega R_m$ *and* $O = \frac{\Omega R_m}{\lambda}$, and the condition of balance is:

$$a - (1-\lambda) b\Omega R = \frac{\omega}{\Omega} \Rightarrow R = \frac{a - \frac{\omega}{\Omega}}{(1+\lambda) b\Omega} \quad R_m = \frac{\lambda}{1+\lambda} \cdot \frac{a - \frac{\omega}{\Omega}}{b\Omega}$$

which implies that R is decreasing into λ, and Rm is increasing into λ:

$$\frac{\partial R}{\partial \lambda} = \frac{a - \frac{\omega}{\Omega}}{b\Omega} \frac{-1}{(1+\lambda)^2} < 0 \;\; i \;\; \frac{\partial R_m}{\partial \lambda} = \frac{a - \frac{\omega}{\Omega}}{b\Omega} \frac{1}{(1+\lambda)^2} > 0$$

This brings us to the following scheme:

Scheme 1: For a certain salary and a certain market Ω, the demand for labour force on market R decreases in market power λ; demand for labour force in the individual company Rm grows in market power λ.

This result points to the fact that the demand for labour force is turning inwards as λ grows.

Because of market power, total demand for labour force R is lower as the company limits the production. However, the market power lies in the fact that there are fewer companies $N = \frac{1}{X}$ out there. Thus, even though the labour force demand is smaller (just like the output), each company has a higher stake at the market and has a higher output, and requires a larger labour force (Wright et al., 2014).

Total labour force demand RD is shown by labour force demand in each market Ω:

Scheme 1

$$R^D(\omega;\lambda) = \int_{\underline{\Omega}}^{\overline{\Omega}} R(\Omega;\omega;\lambda)dF\ (\Omega) = \frac{1}{(1+\lambda)^b}\int_{\underline{\Omega}}^{\overline{\Omega}}(\frac{a}{\Omega} - \frac{\omega}{\Omega^2})dF(\Omega)$$

where the labour force demand is in decline $\frac{\partial R^D}{\partial \omega} < 0$. Scheme 1 implies that the increase of parameter λ leads to a change in labour force demand RD inwards.

Now we turn to the available labour force. Since the external possibility is fixed, any qualified worker č will want to work as long as čw > Š. Thus, the marginal low-qualified worker z* is indifferent whether he works or not: $č^* = \frac{Š}{\omega}$

Total available workforce RS(w) is then:

$$R^S = \int_{\frac{Š}{\omega}}^{1} čdG(č) \quad \underset{=}{G(č) = č} \quad \frac{1-(\frac{Š}{\omega})^2}{2}$$

where the latter equality follows in the case where G is equal. It should be noted that the available labour force grows upwardly in w, as long as G is unregenerated:

$$\frac{\partial R^S}{\partial \omega} = g(\frac{Š}{\omega})\frac{Š^2}{\omega^3} \geq 0$$

where g(č) is the density G(č).

Balance on this competitive labour market equals the available workforce and demand for a labour force:

$$\int_{\underline{\Omega}}^{\overline{\Omega}} R(\Omega)dF(\Omega) = \int_{\frac{Š}{\omega}}^{1} čdG(č)$$

With the available labour force growing upwardly and a shift in labour force demand declining as λ grows, we can occlude the following.

Proposition 1

Let us consider an economy with a constant proportional return. Than the balanced (nominal and real) wages w* and a balanced labour force R* are declining in market power λ.

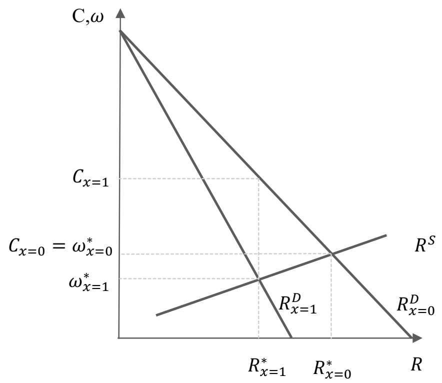
We graphically illustrate the result in Figure 3 in case in which λ = 0 i λ = 1. The general case is shown in the Appendix.

It should be noted that the nominal wage w* is lower for higher market power λ. However, the real wages are even lower, with regard to the fact that the actual wages are represented by s $\frac{\omega^*}{C^*}$. In a perfect competitiveness real wages are 1 (w* = C*) where under the market power we have e $\frac{\omega^*}{C^*} < 1$.

Even with a perfectly elastic labour force, where the nominal wages are constant, the real wages are in decline in market power. In order to observe the trend, take a look at the case of a perfectly elastic labour force. When w = Š, and s θ = 1 i Ω = 1, real wages are displayed as:

$$\frac{\omega}{C} = \frac{Š}{\frac{1}{1+\lambda} + (\frac{Š}{\Omega} + \lambda a)}$$

Figure 3 Workforce demand, workforce available and balance for λ = 0 (perfect competitiveness) and λ = 1 (monopoly). Parameters Ω = 1, θ = 1 meaning that Q = R



Source: Liu, X., Van Jaarsveld, D. D., Batt, R., Frost, A. C. (2014), "The influence of capital structure on strategic human capital"

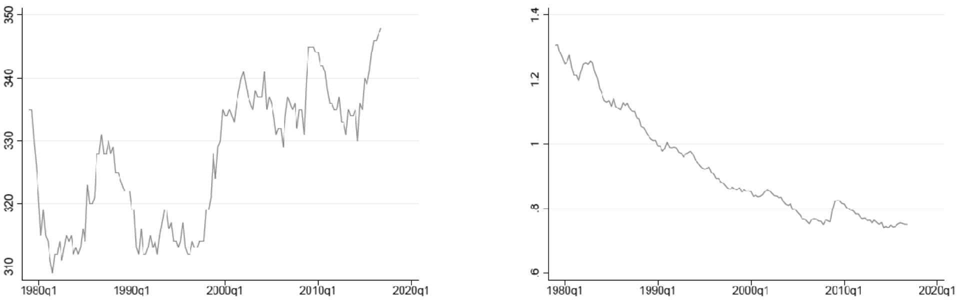
Trivially, real wages are in decline in market power λ. Wage is constant and the prices are growing:

$$\frac{\partial \omega}{\partial \lambda C} = \frac{\check{S}(\frac{\check{s}}{\Omega} - a)}{\frac{\check{s}}{\Omega} + \lambda a} < 0$$

Now we can connect these theoretical discoveries with empirical evidence of the next two implications of the market power growth (Decker et al., 2014)2 There is vast evidence on stagnation of low wages in the last couple of decades consistent with the findings in result 1. Figure 4a graphically illustrates the median of weekly wages in unchanged price values from 1982. There was little or no change of the median of wages from 1980s. In the presence of economic growth, it means that the share of the median of wages in GDP per capita has decreased. Figure 4b illustrates the relation of wage medians to GDP per capita. There has been a secular decline in ratio of 1.3 in 1980 to 0.75 at present day.

This is not just a matter of how distribution of earnings spreads during a life cycle (Guvenen et al., 2017).

Figure 4 Evolution of the wages' median (1980-2016) Data from FRED, CPS. (a) median of wages (on a weekly basis, prices from 1982) (b) the ratio of median wages and GDP per capita

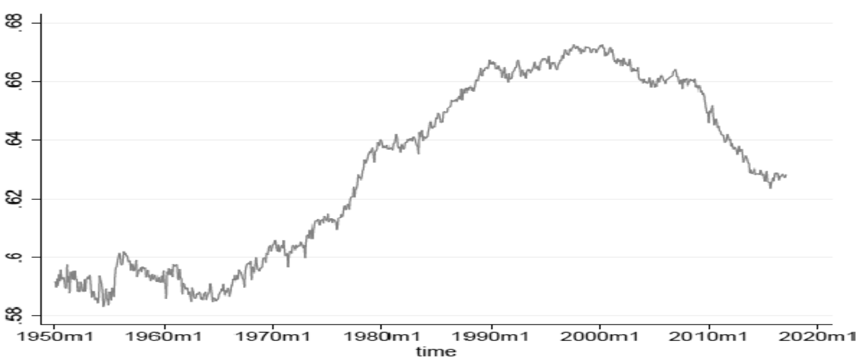


Source: De Locker, J. (2017), "The Rise of Market Power and the Macroeconomic Implications"

Implication 4 Secular decline of the labour force share

Figure 5 illustrates the rate of the workforce share in the economy of the USA since 1950. We witness a strong decline from the mid-1990s. It seems that the trend does not coincide with the moment of market power growth. However, a sudden upheaval of the labour force from the sixties on was caused by a greater share of women on the labour market, which brought about a change in the available labour force. This trend was stabilized in the mid-nineties, which is consistent with the fact that we only start noticing the decline of a total share of the labour force due to growth in market power.

Figure 5 Total labour force share, (1950-2016) Data from FRED, CPS



Source: De Locker, J. (2017), "The Rise of Market Power and the Macroeconomic Implications"

4. Conclusion

Using micro data on the US public limited liability companies since 1980 we have demonstrated that the margins were relatively constant, around 20% above the marginal cost. From 1980 to 2014 there were significant changes of the pattern, with margins displaying a steady growth, from 18% to almost 67% in 2014, which is an increase of three and a half times.

We have documented the properties of this growth, which is a consequence of changes within the industry easily brought down to margin growth of companies with the highest margins. Margins are usually higher in smaller companies, but it seems to be a result of the effects of composition in all industries because it disappears when we deconstruct the margin on a specific-industry level (Bernard et al., 2003).

We use this growth to study implications it had on secular macroeconomic trends over the last decades: 1) reduction of workforce share, 2) reduction of equity, 3) wage cuts for the low-qualified workforce, 4) reduction of labour force, 5) reduction of labour force flows, 6) reduction of the migration rate, 7) slower output and GDP (Eeckhout, Weng, 2017; Foster et al., 2008).

Naturally, there are other secular trends coinciding with the market power growth: 1) reduction of the rate of new companies due to major obstacles that have been raised by existing companies; 2) reduction of long-term interest rates due to a decline of the demand for capital (as a result of reduced amounts for companies with market power) and increased capital supply (due to higher profit); 3) increased wage inequality, wage cuts for the low-qualified workers, as stated above, together with an increase in wages of the qualified workforce due to profit sharing; 4) great moderation, or a belief that the output fluctuation has fallen since 1980 (Guvenen et al., 2017), has lost its appeal following the great recession, but continues to be highly prominent in data, especially in the last decade, naturally, with the exception of the year 2008.

There are two exceptional political consequences stemming from the market power growth (De Locker, 2011; De Locker et al., 2016). The first one is inflation. Compared to a scenario without market power growth and with the same technology development, prices would be going up by 1% on an annual basis (42% over 35 years, from 1.18 to 1.67). This implies that the inflation was higher than it would have been without the market power growth. This is really surprising, taking into consideration the low rates of inflation in a couple of last decades, and especially low rates since the great recession. Of course, monetary policy is not an appropriate tool to remove inflation. That would be the exclusive right of antitrust policy.

Another consequence is connected to the value of the stock market. Stock prices reflect a disrupted flow of dividends and profits. Thus, the stock market under market power is overestimated in relation to a competitive economy. If investors believe that the current profit rate, which is four times higher than the one in 1980, is permanent, than it could be expected that the capitalization of the stock market would be four times higher than the one under perfect competitiveness (Colard-Wexler, De Locker, 2016; Davis, Kahn, 2008).

That would place the Dow Jones index on the 5,500 point level instead of its present value of almost 22,000. It is a naive calculation because market capitalization also reflects a great margin, total value of sold goods, which decreases with the market power. How great the effect of market power is on the stock market value depends on the elasticity of demand.

We should keep in mind that even the stock market can grow if the output is gone, for instance, when productivity growth is zero, and the market power and with it the profit increases. In the presence of market power, the stock market is not a valid indicator of economic output (Wooldridge, 2009).

Margins are multiplying faster than ever, at least since World War II when our data begins. The question to be answered is if the trend will continue, but for now, we have no indications that margins might start declining soon.

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UTJECAJ LJUDSKOG KAPITALA I PROMJENE TRŽIŠNE SNAGE NA TRENDOVE U EKONOMIJI

Sažetak

Činjenice koje određuju makroekonomske trendove su smanjenje radne snage i smanjenje plaća, a neki trendovi rezultiraju smanjenom mobilnošću radne snage, obično motiviranim znatno višim plaćama u drugim poduzećima. Nadalje, svjedoci smo trendova koji se odnose na udio radne snage, kapitala i rasta proizvodnje. Ovaj rad podupire tezu prema kojoj su ti trendovi ukorijenjeni u povećanju tržišne snage počevši od 1980.

Nadalje, ovaj rad analizira razvoj marži korištenjem podataka na razini poduzeća u gospodarstvu SAD-a od 1950. godine. U početku, marže su bile stabilne ili u laganom padu. Prosječne su marže prošle porast od 18% iznad graničnih troškova u osamdesetim godinama do 67% rasta koji danas vidimo. Čini se da nema jasnog uzorka koji se može identificirati u svim industrijama, ali marže imaju tendenciju da budu više u manjim poduzećima u svim industrijama, a veći rast obično se bilježi kao rezultat rasta unutar industrije.

Ključne riječi: marže, makroekonomska kretanja, tržišna snaga