Changing Business Dynamism and Productivity: Evidence from Italy

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Abstract

The goal of this paper is to study the evolution of Job Reallocation in Italy over the 2005-2018 period and to illuminate the underlying reasons for the observed trend. Following the empirical framework laid out in Decker et al (2020, AER), I show that the decline in Job Realllocation is driven by a reduction in firms' labor force adjustments to productivity realizations. Further, I discuss possible reasons for the responsiveness decline and I find some evidence that a decline in the degree of competition is a valid candidate to explain the more muted employment response to productivity realizations observed in recent years.

1 Introduction

Business Dynamism can be defined as the ensemble of mechanics characterizing business birth, expansion, decline and exit. The main reason why business dynamism will be the subject of this study is that it is a crucial driver of the productivity-enhancing allocative process. The main aspect of business dynamism that will be investigated in this paper is job reallocation. I will show that this variable has declined in Italy over the recent years. The empirical strategy that I will follow to explain the job reallocation decline is best understood thinking at this problem through the lens of a simple model of firm dynamics. In standard models, job reallocation arises from the growth and survival response of businesses to their exogeneous productivity draws. Hence declining reallocation arises from either of two forces. Either a decline in the volatility of the productivity process, leading to a more predictable business environment which reduces reallocation by lowering firms' needs to alter their workforce. Or increased frictions on labor adjustments, which weaken the "responsiveness" of businesses to their productivity realization, since they make any labor adjustment more expensive. These two possible explanations refer to the "Shocks" and "Responsiveness" hypothesis.

The empirical strategy that I will follow allows me to tell apart the two hypotheses by looking at several moments of interest which can reflect changes in the Total Factor Productivity (i.e. TFP from here onward) process or in the degree of frictions to labor adjustments. The main moments are: dispersion of firms' TFP, dispersion of firms' labor productivity and business growth and survival responsiveness to productivity realizations. I will show that the empirical evidence drawn from these moments is consistent with an increase in adjustment frictions. This conclusion mirrors the findings of (Decker 2020, AER), this is my reference paper which

conducts the analysis that I have just laid out for the United States economy over the 1980-2010 period.

After completing the first part of my thesis following the footsteps of my reference paper, I try to offer a novel contribution to the literature in the form of an explanation of the responsiveness decline. Because of data constraint, the only potential driver of the responsiveness decline that I am able to test is a potential change in the degree of competition. To show that decreasing competition may have led to dwindling responsiveness, I proceed in two steps. Firstly, I verify that competition has decreased over the period under study. Secondly, I check that there is a reduced-form relationship between a lower degree of competition and a more muted response of employment to a TFP realization. Stringing these two findings together, I am able to provide some evidence in favor of declining competition as a driver of lower responsiveness.

The remainder of this paper is organized as follows. Section 2 explains the data, main variable and some results. Section 3 comprises the core empirical analysis to explain the job reallocation decline. Section 4 discusses potential drivers of the decline in responsiveness, testing whether declining competition may be a candidate. Section 5 shows that the results are robust to an alternative estimate of TFP. Finally Section 6 concludes.

2 Data and Main variables

Descriptives

The main data source is the CERVED dataset. A comprehensive dataset of small and medium-sized Italian firms. The dataset comprises information on accounting

data, number of firms' employees and the firm's ATECO code (i.e. its industry classification). This dataset is a panel where firms are the unit of reference and observations are recorded once per year. The period 2005-2018 will be the focus of this study. In this paper I will focus on the whole economy, except for the financial and insurance sector. Since for these sectors the estimation of productivity is less reliable and of more difficult interpretation

	Full sample				
	No. of Observations	Mean	SD	Min	Max
Firms	1,047,710	-	-	-	-
Employees	-	12.10	20.38	1	112
Exit	-	0.18	0.38	0.00	1.00
Span	-	8.99	4.28	1.00	14.00
Investment Rate	-	0.26	0.31	0.00	1.00
N	5,962,576				

The above table provides a snapshot of they main variables winsorized at 3%. It can be seen that over a million firms are in the panel in the 2005-2018 period. The average firm has 12 employees, an 18% chance of exiting the panel in any given year and it will remain 9 years in the panel.

Main Variables

The starting point of this analysis is to look at the evolution of job reallocation over the period under study. Job reallocation refers to the sum of jobs created and destroyed in a year and it is a powerful indicator of the economy's degree of business dynamism. Indeed, a high job reallocation implies that productive firms manage to grow bigger and unproductive firms downsize. Leading to an efficient allocation

of labor across the economy. For each firm, I will measure the rate of change in number of employees using the Davis – Haltiwanger – Schuh (DHS) growth measure, in modulus. Then my measure of job reallocation is just the weighted mean of this growth rate. Where the weights are the firms' number of employees $E_{i,t}$ over the yearly mean number of employees $\overline{E_t}$. Moreover, the average number of employees is constant at around 19 throughout the years. Hence changes in the firm distribution over the years are not a concern (for more details on this refer to the Appendix).

$$JR_t = \frac{1}{N_t} \sum_{i=1}^{N_t} \frac{E_{i,t}}{\overline{E_t}} \frac{|E_{i,t+1} - E_{i,t}|}{E_{i,t}/2 + E_{i,t+1}/2} \tag{1}$$

A second crucial variable is TFP. I estimate it imposing the inputs' elasticities equal to the industry-mean cost shares. Where the industry classifications corresponds to the 2-digit ATECO code. Further I assume a Cobb-Douglas production function with constant returns to scale, so that the TFP is found according to the following formula:

$$ln(TFP_{i,t}) = ln(Y_{i,t}) - ln(L_{i,t}) - ln(K_{i,t}) \tag{2}$$

where Y is value added, L is cost of labor and K is capital. Having obtained the TFP of each firm, it will be very important in this study to look at its dispersion. TFP dispersion is calculated as the standard deviation of log TFP, deviated from the industry mean. This is a revenue-based, since output Y is a function both of real quantity and price. This measure of TFP is increasingly referred to as TFPR. TFPR is defined by Foster, Haltiwanger, and Syverson (2008) as P*TFPQ, where P is the firm-level price and TFPQ is the typical measure of firm-level technical efficiency. Under perfect competition, firms are price takers and hence TFPR will equal TFPQ. In case of lack of perfect competition the two measures will differ, but still there is evidence that that the two measures are highly correlated, as showed

in Foster, Haltiwanger, and Syverson (2008, 2016). Hence a TFPR-based inference should not invalidate the conclusions of this study.

Another variable that must be introduced is Labor Productivity. This is defined as the firm's value added over its number of employees.

$$LaborProductivity_{i,t} = \frac{Y_{i,t}}{E_{i,t}} \tag{3}$$

Defining this variable will allow me to see how the labor productivity dispersion has evolved throughout the years. The latter is again defined as the standard deviation of log labor productivity deviated from the industry mean. The CERVED dataset also provides the 6-digits ateco code for each firm. This is a very granular industry classifications, whereby the whole economy is divided into 1524 sectors. This variable will be crucial in the second part of this thesis when computing the Herfindhal-Hirshman Index, as it will be used to split the Italian economy in different markets.

Preliminary Results

Having described the data and introduced the main variables, it is time to dive into the first results of the thesis. The first question that this study intends to answer is how job reallocation has evolved over the years. The figure below shows a marked decrease in the DHS job reallocation for the whole economy.

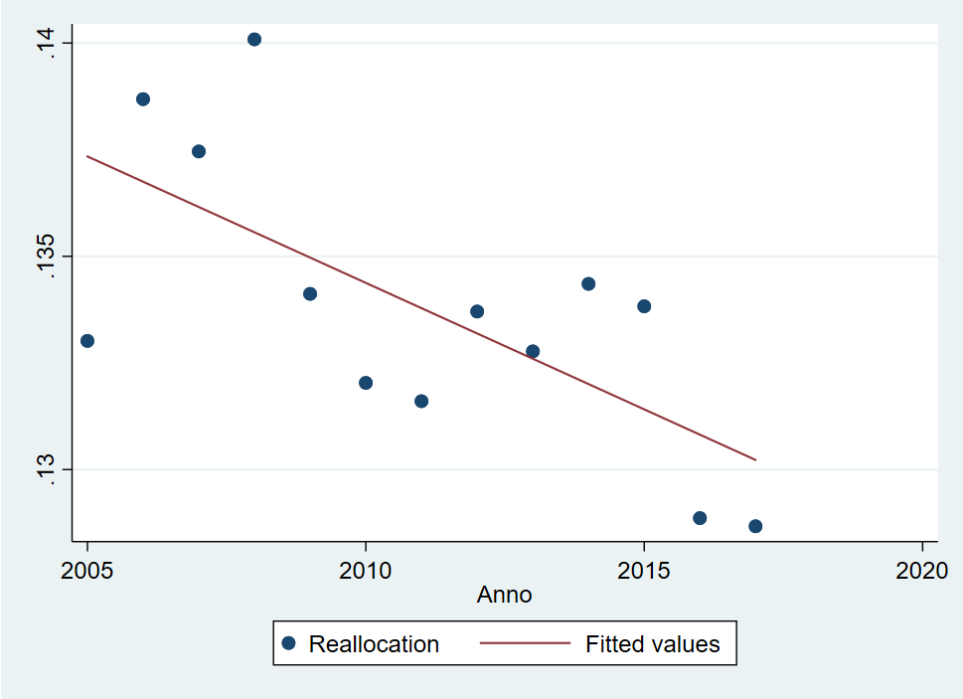

Figure 1: Job Reallocation

3 Shocks vs Responsiveness

Theoretical Underpinnings

The contribution of this thesis lies entirely in the empirical results that will be discussed later on, however before proceeding it is crucial to clarify the economic intuition behind my empirical strategy. The rationale to explain the reallocation decline with two hypotheses is best understood keeping in mind the large family of models of firm dynamics in which firms face exogeneous productivity shocks and in each period they choose whether to remain or exit the market and they adjust their inputs accordingly. In these models the productivity realization is drawn from a persistent AR(1) process and it is observed before the firms make any of their choices. Further labor and capital adjustments require an adjustment cost.

This quick sketch of the model is needed to show that the firm's hiring and firing decision only depends on the productivity realization, on the parameters of the productivity AR(1) process and on labor adjustment costs. Indeed, this cursory description of the model is sufficient to lay out two hypotheses for the decline in job reallocation: the Shocks and the Responsiveness hypothesis. Indeed both a decrease in the magnitude of the TFP innovations and a rise in labor adjustment costs will lead to more modest labor adjustments.

Following the reference paper, I will exploit some empirical moments to tell the two hypotheses apart. Indeed, the alleged increase in labor adjustments costs can be investigated looking at whether firms' employment responsiveness to TFP shocks has varied over the years; by regressing firms' employment change on TFP, interacted with a time trend. Instead, the decrease in the magnitude of the TFP innovations can be interpreted examining the cross-sectional TFP dispersion. The rationale being, that a change in the TFP stochastic process, will lead to a change in the cross-sectional variance of TFP. Lastly, another moment that I will consider is the evolution of labor productivity dispersion throughout the years. Where dispersion again refers to the log labor productivity standard deviation, deviated from the industry mean. This moment is particularly important because it should behave in different ways according to which of the two hypotheses holds true. In fact, the labor productivity dispersion is expected to increase if a decline in responsiveness occurred and decrease if a fall in TFP dispersion drove the job reallocation decline. The intuition behind these two predictions is straightforward: if an increase in labor adjustment costs were the main driver, we would expect that the less frequent labor adjustment increased the labor misallocation; bringing about higher labor productivity dispersion. Conversely if a decrease in TFP volatility was the driver behind the job reallocation decline, we should see a decreased labor misallocation (i.e. lower

labor productivity dispersion).

Notice that the attempt to explain the job reallocation decline either with "Shocks" or a "Responsiveness" hypothesis inevitably leads to a very broad interpretation of these two concepts. For instance, the "Responsiveness" hypothesis encompasses a plethora of possible factors. As anticipated above the most immediate interpretation is a rise in labor adjustment costs. However, more recent models offer alternative interpretations such as a weaker relationship of firm growth (and survival) with fundamentals or a fall in the degree of competition. Moreover, it will be interesting to see if the evolution of the moments of interest has an effect on entry and exit. Indeed, a rise in adjustment may reduce the lower bound of productivity necessary for survival as shown in Hopenhayn and Rogerson (1993). The empirical prediction, then, is that not only will firm growth for continuers become less responsive to productivity, but so will exit.

Empirical Analysis

In this subsection I will describe the evolution of the moments of interest to shed light on the drivers behind the job reallocation decline. I will consider the whole economy except for the financial and insurance sector, as for those sector the estimation of productivity is less reliable and of more difficult interpretation.

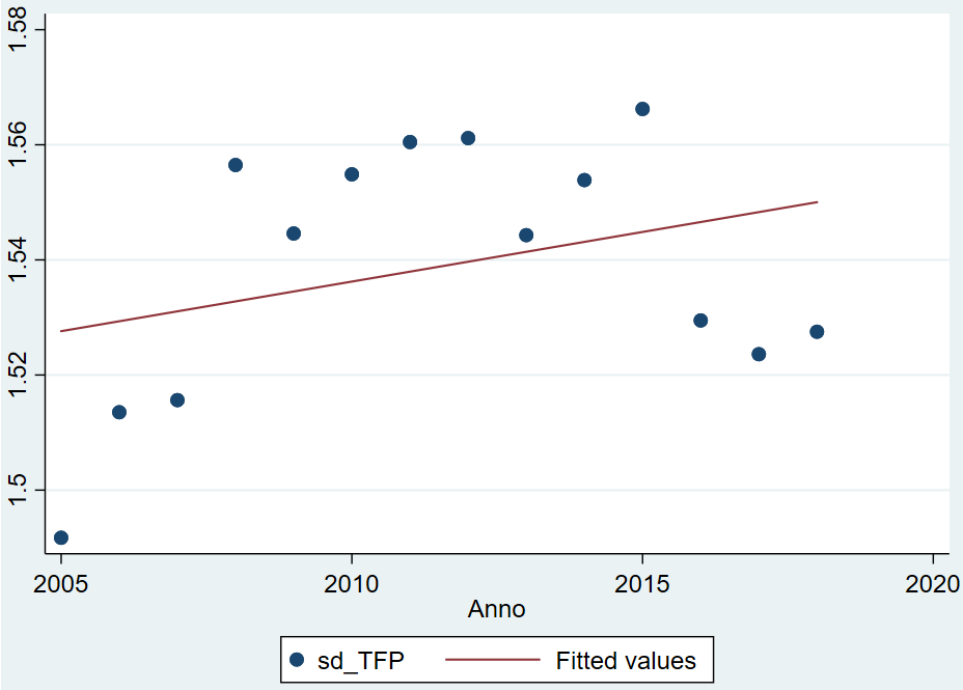

Figure 2: TFP Dispersion

Starting by testing the Shocks hypothesis, I plot the evolution of TFP dispersion, quantified as the standard deviation of log productivity deviated from industry mean. Where the industry is defined as the 6-digit ateco code. So according to the Shocks hypothesis, we would expect a decrease in TFP dispersion, indicative of a more tranquil business environment. However, looking at Figure 2 that is not what happened. Indeed, if anything, TFP dispersion has risen over the 2005-2018 period. Hence, this first result does not bode well for the Shocks hypothesis.

Let's then turn our attention to the Responsiveness hypothesis. To this aim I will regress firms' employment change on log TFP, while controlling for firm, sector and year fixed effects. Where the employment change is the DHS growth measure introduced before. Most importantly, the specification includes two interaction terms of TFP with a linear and a quadratic trend. These are in fact the coefficients of interest since the question we are after is whether firms' labor adjustments has

become more muted to TFP shocks.

Table 1: Responsiveness whole Economy

	(1) Employment Change	(2) Investment Rate	(3) Exit
TFP	0.0858***	0.0351*	-0.0422***
	(0.000464)	(0.0158)	(0.000326)
TFP × Trend	-0.000814***	0.00156	0.000634***
	(0.000101)	(0.00384)	(0.0000693)
TFP × Trend^2	-0.0000292***	0.000149	0.0000263***
	(0.00000682)	(0.000243)	(0.00000438)
Employees	-0.0000136***	-0.0000553	-0.00000613***
	(0.00000107)	(0.0000477)	(0.000000862)
Constant	0.149***	0.475***	0.0321***
	(0.00132)	(0.0416)	(0.000963)
Observations	4256057	5315487	5321434

Figure 3: Responsiveness

The regression that I just described corresponds to the first column of Figure 3. As expected the first coefficient is positive, showing that a positive TFP shock triggers expansion in the following period. And the second and third coefficients are negative, providing concrete evidence for the decline in responsiveness over the years. To get a more clear idea of the decline in responsiveness, Figure 4 displays the TFP responsiveness for each year, setting the coefficient in year 2005 to zero. The graph below shows a steady decrease in the interaction term. In the last years of the panel the interaction coefficient is -0.03, which corresponds to a significant decline given that from the table it can be seen that the baseline TFP coefficient is 0.86.

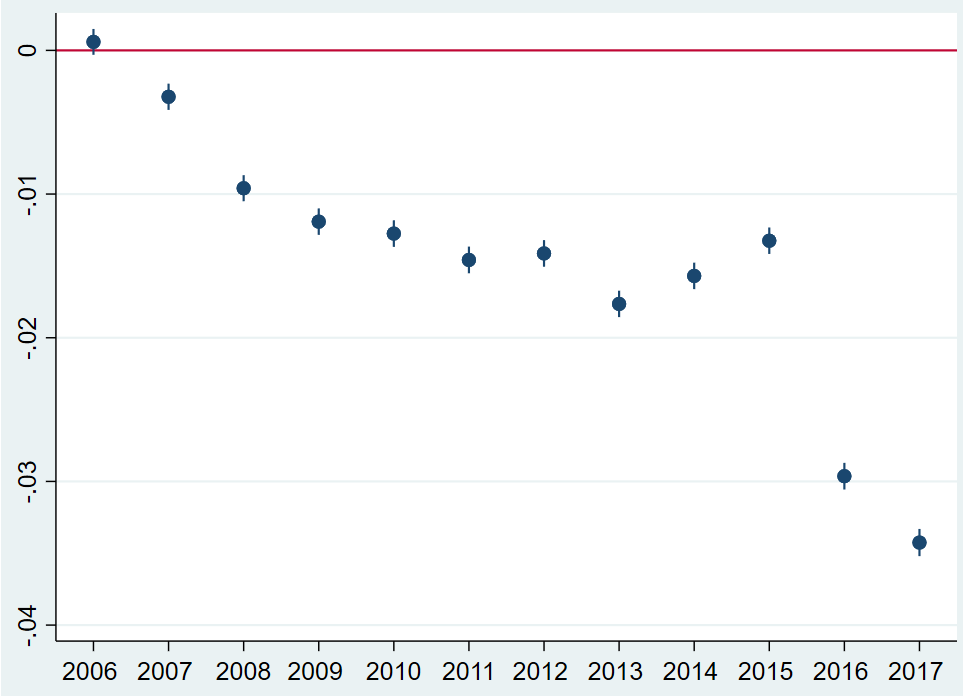

Figure 4: Responsiveness by Year

The second column of Figure 3 shows the same regression with investment rate (i.e. investments over the capital stock) as the dependent variable. Again, as expected, we have a positive coefficient for TFP but there is no significant trend throughout the years. Both a declining and a rising trend could have been interpreted following an economic rationale; either by the presence of common drivers of responsiveness or by a change in the firms' optimal adjustment policy. Indeed, a declining trend could be seen as an indication that the factors behind the labor responsiveness decline affect investment responsiveness too. Whereas a rising investment responsiveness could have suggested that the drivers behind the labor responsiveness decline do not affect investment responsiveness (eg. think of stricter labor protection law) and firms are making more frequent capital adjustment in response to the declining flexibility of labor. The lack of a significant trend shows that neither of these possible explanations have played a major role. Another interest-

ing difference is that the TFP coefficient for the investment rate regression, despite being positive and significant, is much lower than that of the employment change regression. This is consistent with the proven fact that capital is a less flexible input than labor. In the third column the dependent variable is "Exit": a dummy equal to 1 for the last year a firm is in the dataset and 0 otherwise. Here, as expected, the TFP coefficient is negative. Meaning that a positive TFP realization lowers the probability of exiting the market in the following period. In this regression both interactions terms are positive showing that throughout the years, firms selection on TFP has declined. As previously anticipated this is one of the possible side effects of a responsiveness decline. Since, as firms growth becomes less responsive to TFP realizations, the TFP threshold for survival widens; leading to weaker selection. Notice that this explanation is also consistent with the slight increase in TFP dispersion showed before.

Having shown the declining trend for the Employment Change and Exit decision, in the graph below I quantify the effect to provide better intuition on their economic significance. The first three bars show how bigger is the employment growth of a firm that has a TFP one standard deviation above average. Where each bar refers to a year of the panel to convey the decline in responsiveness. Indeed it can be seen that in 2005 a productive firm had an employment growth 12.5% greater than average, while in 2018 the extra growth was only 10%. Similarly the probability of exit of a productive firm in 2005 was 6% lower than the average and in 2018 only 4% lower. For reference the average firm grows at 2.7% and has a 18% exit probability.

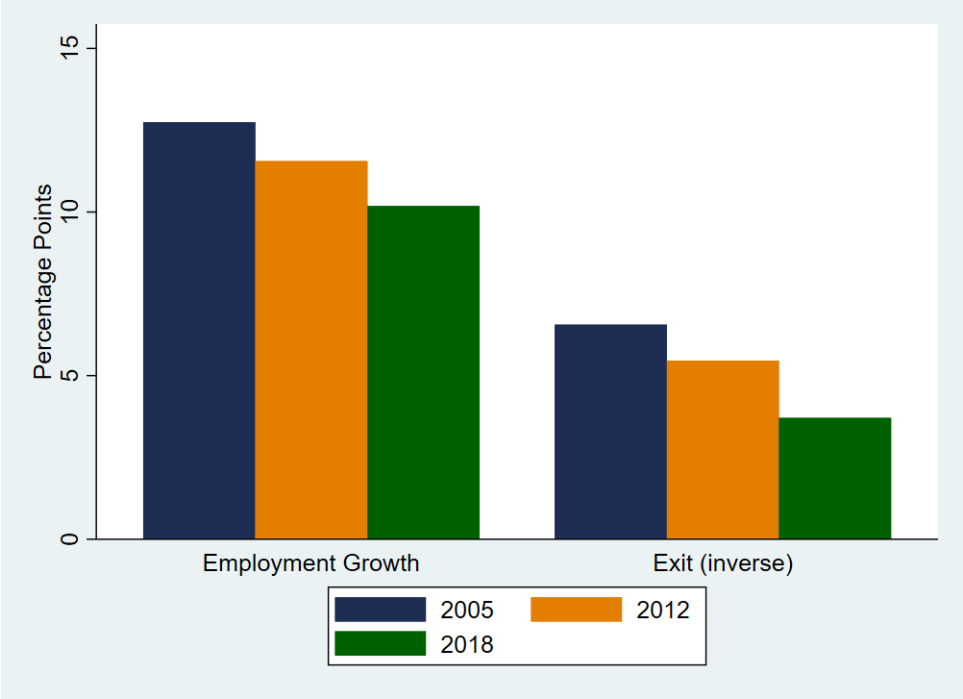

Figure 5: Economic Significance

The last moment of interest, to tell apart the shocks and the responsiveness hypothesis, is the labor productivity dispersion. As previously anticipated, this quantity is of particular importance since we expect it to behave in opposite ways according to which hypothesis holds true. From Figure 6 it can be seen that the labor productivity dispersion has increased in the period under consideration. This is an additional piece of evidence in favor of the responsiveness hypothesis, since a larger degree of misallocation is exactly what we would expect if the fall in job reallocation were due to an increase in frictions preventing prompt labor adjustments.

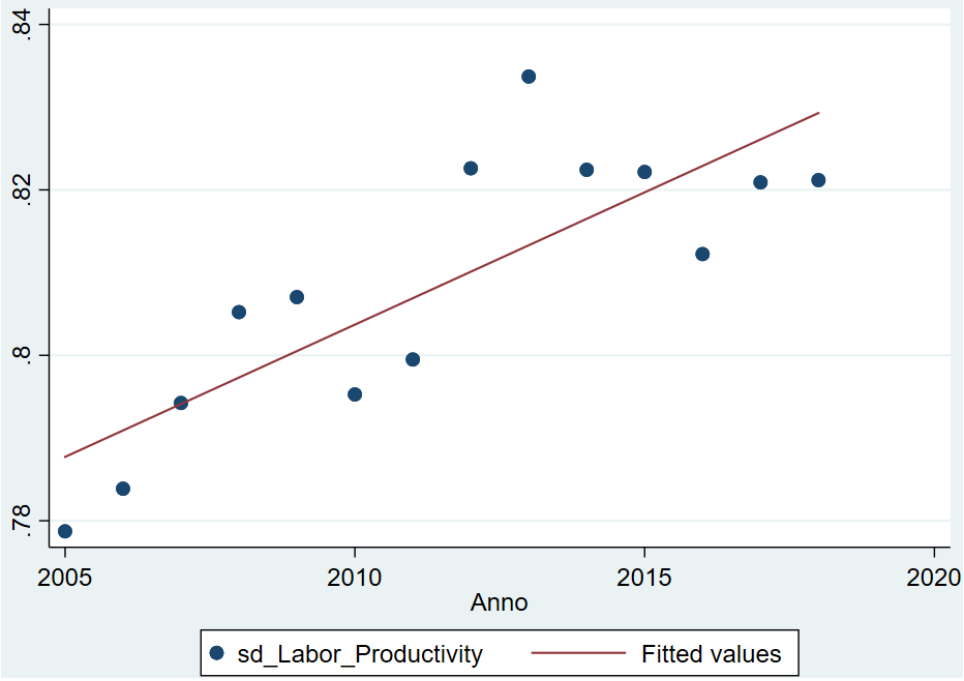

Figure 6: Labor Productivity Dispersion

4 Drivers of the Responsiveness Decline

In the first part of this thesis I have provided evidence of a decline in the degree of Job Reallocation, driven by lower responsiveness of firms' employment decision to productivity realizations. In this section my objective is to dig deeper into the possible factors that may have brought about the responsiveness decline.

Discussion of the Possible Drivers

In the previous section, to simplify the intuition, I illustrated how in a basic model the responsiveness decline is triggered by rising labor adjustment costs. Actually though, there is a slew of factors that may have played a role and that are easy to miss if we only look at this problem through the lens of a simple model. Starting from higher labor adjustment costs, concretely some causes may be: occupational

licensing rules, land use regulations, rules or norms that increase job match specificity and any form of labor protection law. These factors are the most immediate explanation, but unfortunately my data does not allow me to track the evolution of labor protection law throughout the years, or of any of the other factors mentioned. Moreover, there is some evidence that labor markets have become more flexible over the last decades (as shown by the OECD Labor Market regulation index), so this is likely not a promising route to explain the fall in responsiveness.

Another potential driver is decreased competition, as explained in De Loecker (2020). To understand the rationale for this, consider two markets at the polar opposites: a market controlled by a monopolist and a market under perfect competition. Under perfect competition, a decrease in marginal cost is entirely translated in a price decrease. Leading to a higher equilibrium quantity. Instead, under a monopoly, a decrease in marginal cost is not entirely translated in a price decrease. Leading to a lower increase in the equilibrium quantity with respect to the perfect competition case. Hence, as the degree of competition falls, output does not react as much to a marginal cost decrease (i.e. firms' employment change becomes less responsive to TFP shocks). Lastly an alternative potential drivers worth mentioning is stronger globalization - Decker et al (2020, AER)- which may have played a role causing subdued business-level growth responsiveness by facilitating cross-border factor adjustment. Meaning that productive firms may have expanded abroad rather than growing in Italy, this could dampen or even eliminate the standard positive correlation between growth and productivity.

Changing Competition

Of all the potential drivers mentioned in the previous subsection, a change in the degree of competition is the easiest to investigate and thus it will be the subject of my

empirical analysis. The identification strategy that I will follow is rather straightforward. Firstly, I will check whether the degree of competition has decreased over the period under study and then I will check whether there exists a significant reduced-form relationship between the degree of competition and firm's responsiveness. The main measures of competition that I will use are the Herfindhal-Hirshman Index (HHI) and markups. The former is a measure of concentration bounded between 0 and 1, increasing in the degree of concentration of the market. The market definition that I will use is the 6-digits ateco code, since it should be an industry classification that is granular enough to provide an accurate market definition. After estimating the HHI for each market, I aggregate them weighting by the size of each market. Markups are estimated following De Loecker et al (2017), where the elasticity of the variable input is the labor elasticity after having estimated the production function following the Olley and Pakes (1996) approach.

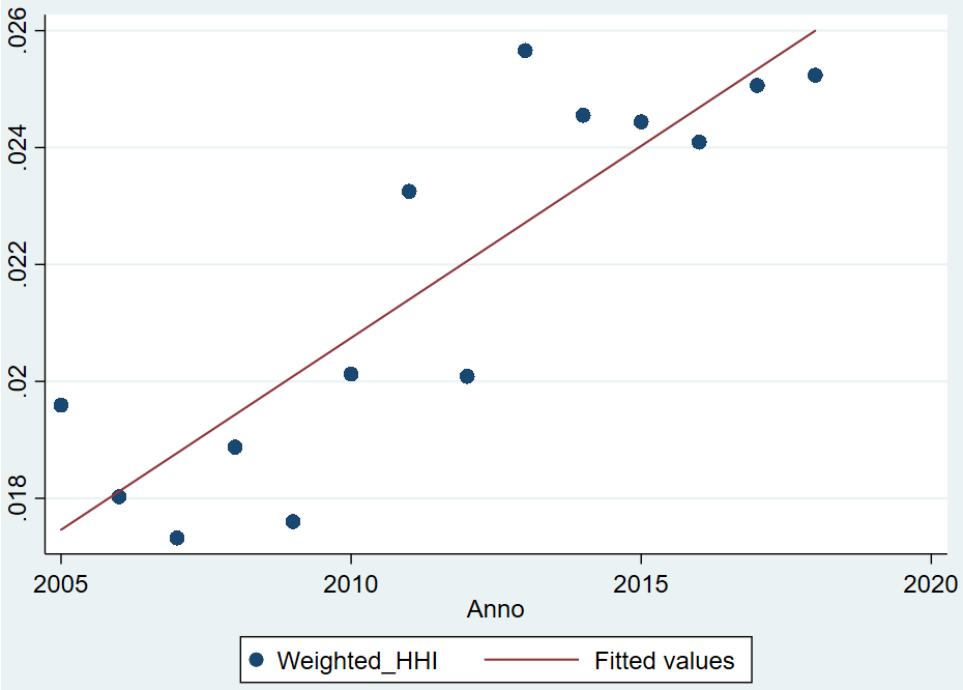

Figure 7: Weighted HHI

Figure 7 shows that, on average, the Italian economy has grown more concentrated over the years. Indeed the mean HHI has increased approximately from 0.018 to 0.025. To confirm that increased concentration may have played a role in the responsiveness decline, the second step is to look at the relationship between firms' labor responsiveness and the HHI of the market they are in. To this aim, I regress again the main three dependent variables on TFP, the interacton of TFP and HHI and year, firm and sector fixed effects.

Table 1: HHI - whole Economy

	(1) Employment Change	(2) Investment Rate	(3) Exit
TFP	0.0589***	0.00871	-0.0344***
	(0.000588)	(0.0225)	(0.000452)
HHI	-0.0127***	0.00222	0.00286***
	(0.000445)	(0.0174)	(0.000351)
TFP × HHI	-0.00477***	0.00217	0.000936***
	(0.000121)	(0.00464)	(0.0000933)
Employees	-0.0000138***	-0.0000526	-0.00000698***
	(0.00000107)	(0.0000471)	(0.000000929)
Capital	0.0375***	-0.0800***	-0.0532***
	(0.000324)	(0.0120)	(0.000242)
Constant	0.0700***	0.757***	0.0879***
	(0.00229)	(0.0900)	(0.00181)
Observations	4365546	5467071	5031264

Figure 8: HHI and Responsiveness

The first column shows the main regression of interest, where the DHS growth measure of employment change is the dependent variable. As before the coefficient of TFP is positive. The coefficient of interest is the interaction between TFP and the HHI; it is negative and significant, showing that firms in more concentrated sectors tend to be less responsive. The result confirms the economic intuition and coupled with the increase in average HHI over the recent years, provides some evidence that

the responsiveness decline may be due to a rise in market concentration.

The second column corresponds to the regression having the investment rate as the dependent variable and again the TFP has a positive and significant coefficient. Here the coefficient on the interaction term is negative but not significant. Regarding the last regression, with exit as the dependent variable, the coefficients are significant and point in the expected direction. Indeed a higher TFP predicts a lower probability of exit and in more concentrated sectors the exit selection on productivity is less pronounced.

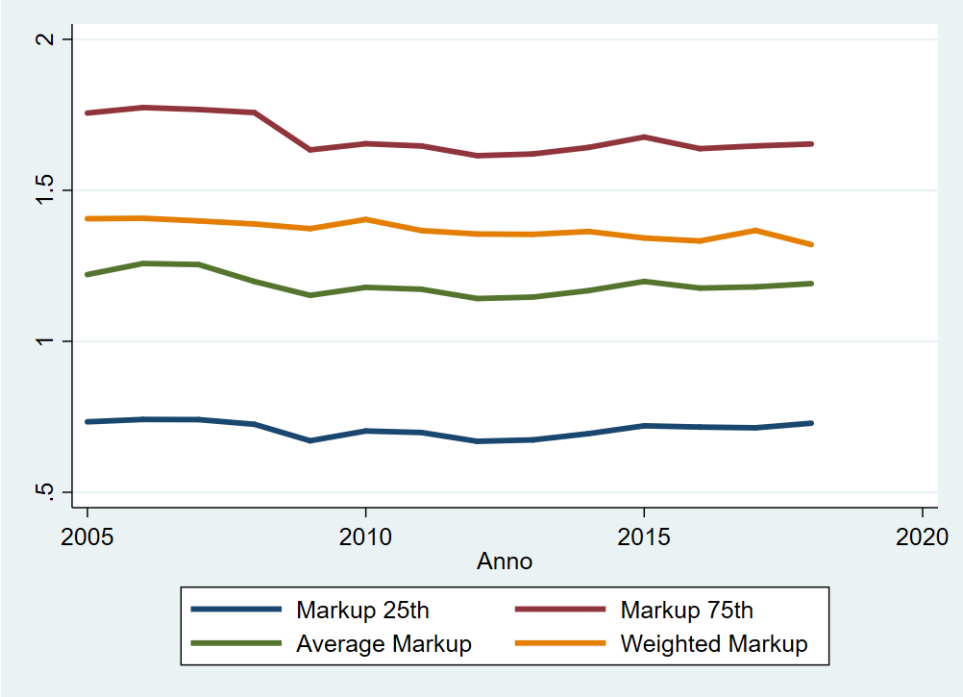

Figure 9: Markup Trend

Now consider markup as an alternative measure of changing level of competition. Where markup are estimated following the procedure laid out before.

$$Markup_{i,t} = \theta^L_{i,t} \frac{P_{i,t} Q_{i,t}}{P^L_{i,t} L_{i,t}} \tag{4}$$

Figure 9 shows that the average markup has kept steady over the period of interest. Then as I have done for the HHI, I investigate whether there is a reduced form relationship between markup and responsiveness to TFP shocks. In Figure 10 again the coefficient on TFP is positive in the first two regressions and negative for the Exit regression. The coefficient of interest though is the interaction term between TFP and markup. In column one it shows that the employment choice of firms with higher markup is less responsive to TFP realizations. The interaction term instead has a positive sign for the investment rate regression. While for the Exit regression it shows a lower selection on TFP as markup increases.

Table 1: Responsiveness and Markup

	(1) Employment Change	(2) Investment Rate	(3) Exit
TFP	0.0512***	0.141***	-0.0119***
	(0.000260)	(0.0117)	(0.000186)
Markup	0.0247***	-0.0293***	-0.0000915
	(0.000162)	(0.00647)	(0.000103)
TFP × Markup	-0.00458***	0.00686***	0.000339***
	(0.0000431)	(0.00164)	(0.0000270)
Employees	-0.0000103***	-0.0000600	-0.00000506***
	(0.00000101)	(0.0000519)	(0.000000812)
Constant	0.0155	1.091	0.342***
	(0.157)	(3.807)	(0.0914)
Observations	3656515	4444394	4108496

Figure 10: Markup and Responsiveness

5 Robustness

Responsiveness Decrease

In the last section I introduced an alternative TFP measure estimated following the control function approach laid out in Olley and Pakes (1996). In this section, as a robustness check, I will replicate the main results of my thesis using this alternative estimate. So to verify that the Responsiveness hypothesis is confirmed, below I show the evolution of TFP dispersion and the Responsiveness regression using the alternative TFP estimate. Starting with the TFP dispersion, as before this is the standard deviation of log TFP deviated from the industry mean. Figure 11 depicts the dispersion evolution showing no significant trend. Indeed, although the fitted line is decreasing, looking at the magnitude it can be seen that the change is negligible.

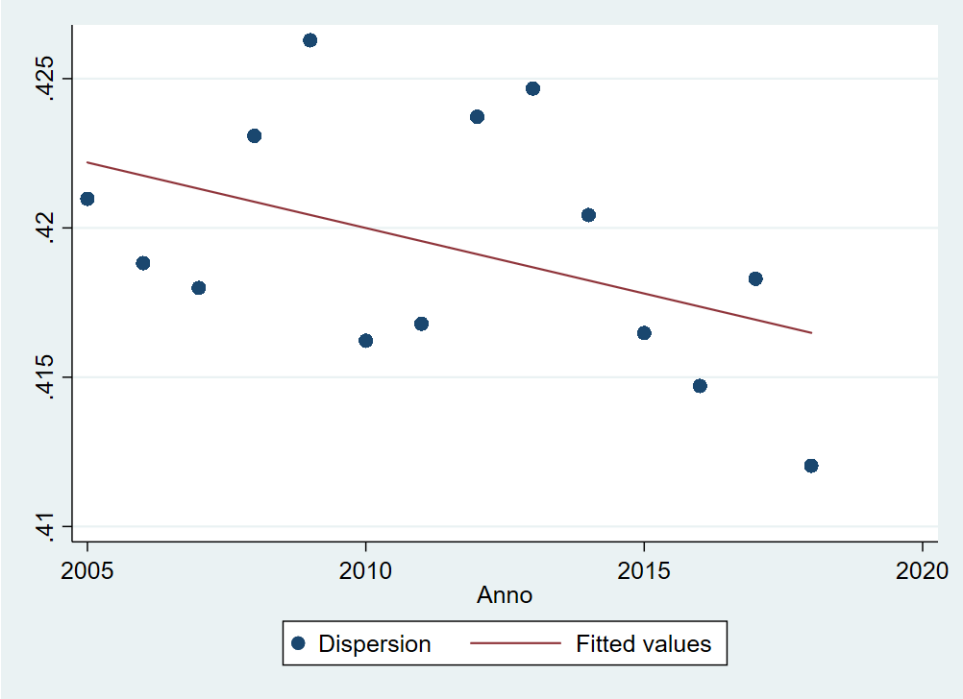

Figure 11: TFP Dispersion - Olley and Pakes Procedure

	(1) Employment Change	(2) Investment Rate	(3) Exit
TFP	0.0887***	0.0514*	-0.0903***
	(0.000493)	(0.0211)	(0.000431)
TFP × Trend	-0.00677***	-0.0148**	-0.000744***
	(0.000125)	(0.00523)	(0.0000963)
TFP × Trend^2	0.000508***	0.00117***	0.000780***
	(0.00000868)	(0.000336)	(0.00000660)
Employees	-0.00000471***	-0.0000102	-0.00000500***
	(0.000000517)	(0.0000251)	(0.000000968)
Constant	0.0160***	0.321***	0.167***
	(0.000686)	(0.0227)	(0.000539)
Observations	3281481	4516763	4175993

Figure 12: Responsiveness - Olley and Pakes Procedure

The second piece of evidence to be replicated is the responsiveness regression. Which again has the same specification as before. The TFP coefficient as expected is positive in the first two regressions and negative in the one with exit as the dependent variable. Regarding the TFP responsiveness trend, the results are mostly in line with the previous specification.

Competition Decline

Now I replicate the two regressions that show the reduced-form relationship between the degree of competition and responsiveness. Starting from the HHI regression, this robustness check confirms the negative interaction coefficient on the employment change regression and the positive one on the Exit regression. Although the former is not statistically significant.

	(1) Employment Change	(2) Investment Rate	(3) Exit
TFP	0.0486***	0.0429	-0.0480***
	(0.000955)	(0.0219)	(0.000317)
HHI	0.00257***	0.0952	-0.0292***
	(0.000107)	(0.413)	(0.00597)
TFP × HHI	-0.000429	-0.0932	0.0155***
	(0.000219)	(0.231)	(0.00333)
Employees	-0.00000956***	-0.0000648	-0.00000373***
	(0.000000441)	(0.0000518)	(0.000000750)
Constant	0.0436***	0.407***	0.0537***
	(0.000727)	(0.0446)	(0.000978)
Observations	3659026	4449286	4455699

Figure 13: HHI and Responsiveness - Olley and Pakes Procedure

As before I run the same regression using markup as the competition measure and the results are consistent with the original regression.

	(1) Employment Change	(2) Investment Rate	(3) Exit
TFP	0.00630***	0.0496*	-0.155***
	(0.000376)	(0.0193)	(0.00102)
Markup	0.0555***	0.0113	0.0902***
	(0.000254)	(0.0129)	(0.00102)
TFP × Markup	-0.00924***	-0.000725	0.0132***
	(0.0000457)	(0.00227)	(0.000158)
Employees	-0.00000108*	0.00349***	-0.00000198**
	(0.000000439)	(0.0000260)	(0.000000748)
Constant	0.00748***	0.238***	0.196***
	(0.000539)	(0.0406)	(0.00166)
Observations	3659026	4449286	4455699

Figure 14: Markup and Responsiveness - Olley and Pakes Procedure

6 Conclusions

In this thesis, I contributed to the large and growing literature on Business Dynamism. My first contribution was to show that Job Reallocation has experienced a decline over the 2005-2018 period. Subsequently, I investigated the reasons for this decline relying on the identification strategy laid out in my reference paper Decker et al (2020, AER). Indeed I considered two hypotheses to explain the trend: a reduction in the magnitude and persistence of TFP shocks (Shocks hypothesis) or a reduction in firms employment growth responsiveness to productivity shocks (Responsiveness hypothesis). By looking at several moments I found evidence in favor of the Responsiveness hypothesis, as my reference paper did focusing on the US economy.

As a second step I investigated possible factors that may have brought about the responsiveness decline. I studied whether changing competition could have played a role, focusing on two measure of competition: HHI and Markup. To investigate whether declining competition was a driver of the responsiveness decline, I pursued a two-step procedure. Firstly I have looked at the evolution of my competition measure over the period. Secondly, I looked for a reduced-form relationship between the degree of competition and responsiveness and firms' responsiveness. The results, although not conclusive, indicate that declining competition is a valid candidate to explain the responsiveness decline.

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7 Appendix

In this appendix I will add some additional evidence to confirm the finding on the job reallocation decline. Namely, I will show that the decline is robust to using an alternative common measure of job reallocation and that the distribution of firm size has remained virtually unchanged over the period under study. The latter is an important check, as firm size is one of the main determinants of the firm's degree of employment change.

Alternative Job Reallocation Measure

Here I show that the decline in job reallocation is robust to another popular specification. This formula is referred to as "Dispersion" in Davis et al (2006) and it is the cross-sectional standard deviation of the DHS growth measure with size-based weights. Again I find a decline of approximately 10%.

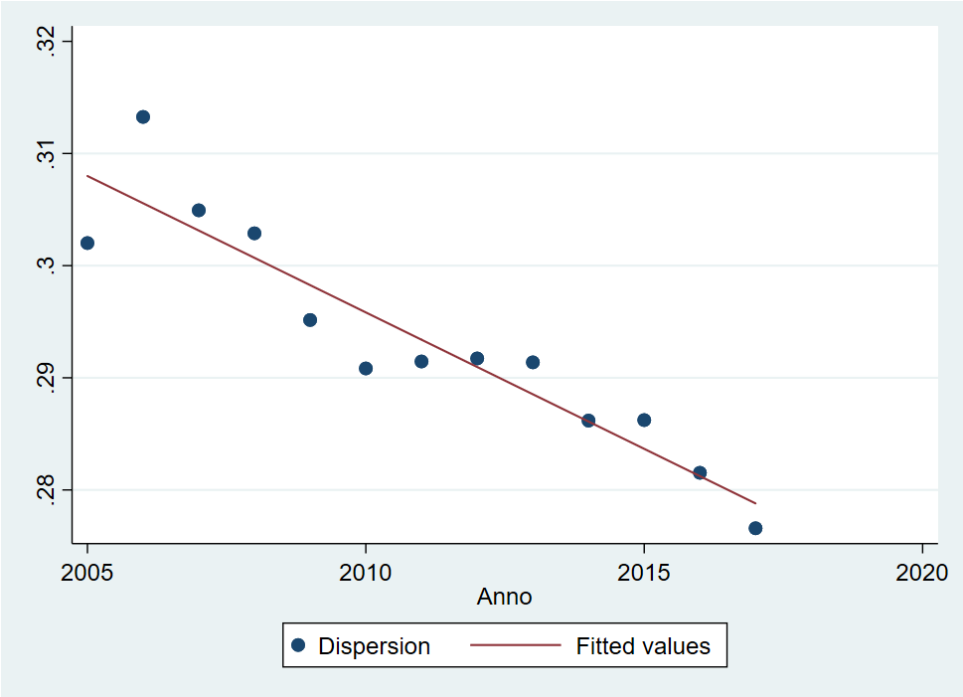

Figure 15: Job Reallocation - Dispersion Measure

Firms' Size Distribution

Now I provide some evidence that the distribution of firms' size has not experienced significant changes over the period under study. Indeed, the rate of change in number of employees is also a function of the firm's size; therefore this is an important check to make sure that the job reallocation decline is not the consequence of a mere change in the distribution of firms sizes over the years but rather it was brought about by the factors analyzed at length in my thesis.

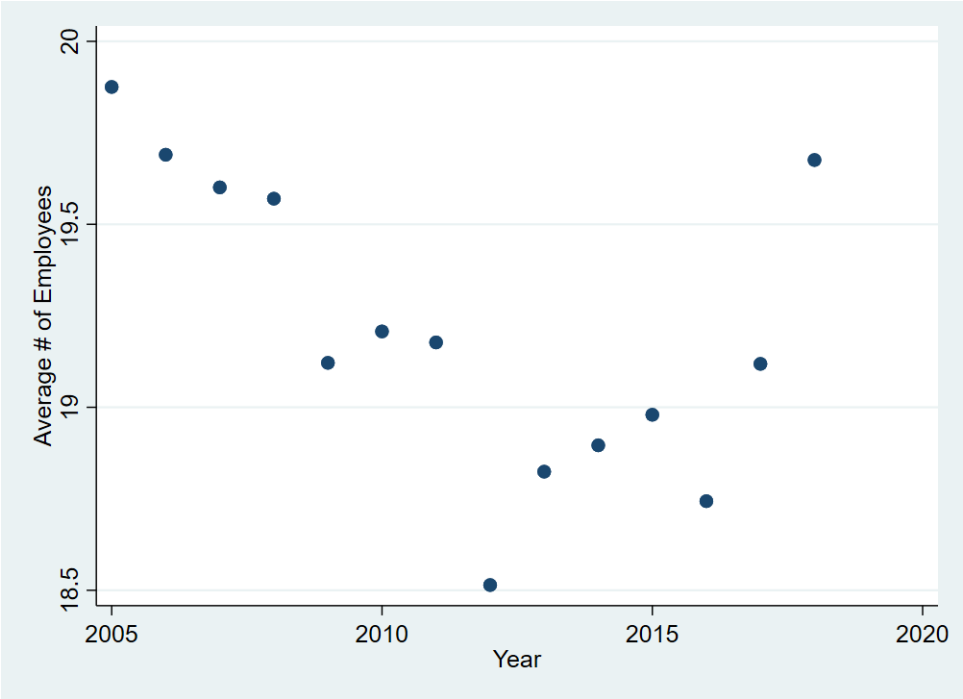

Figure 16: Average Number of Employees by Year

Firstly I show that the size of the average firm experiences minimal variation throughout the years. Moreover the changes in average size does not seem to be correlated to the job reallocation trend, since the former is U-shaped and the latter is decreasing.

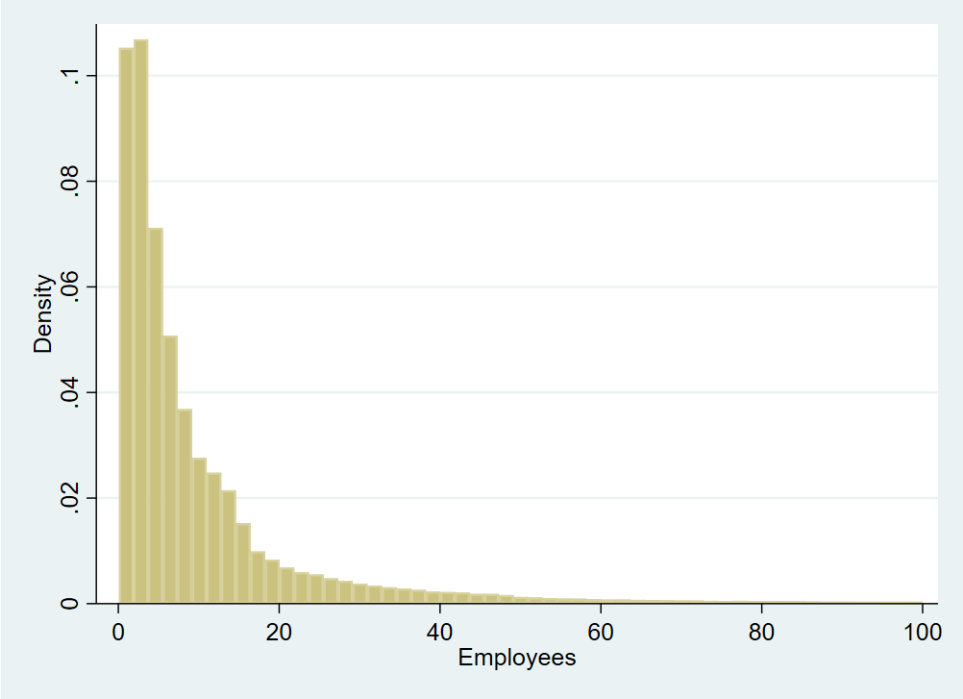

Figure 17: Density of Number of Employees in 2005

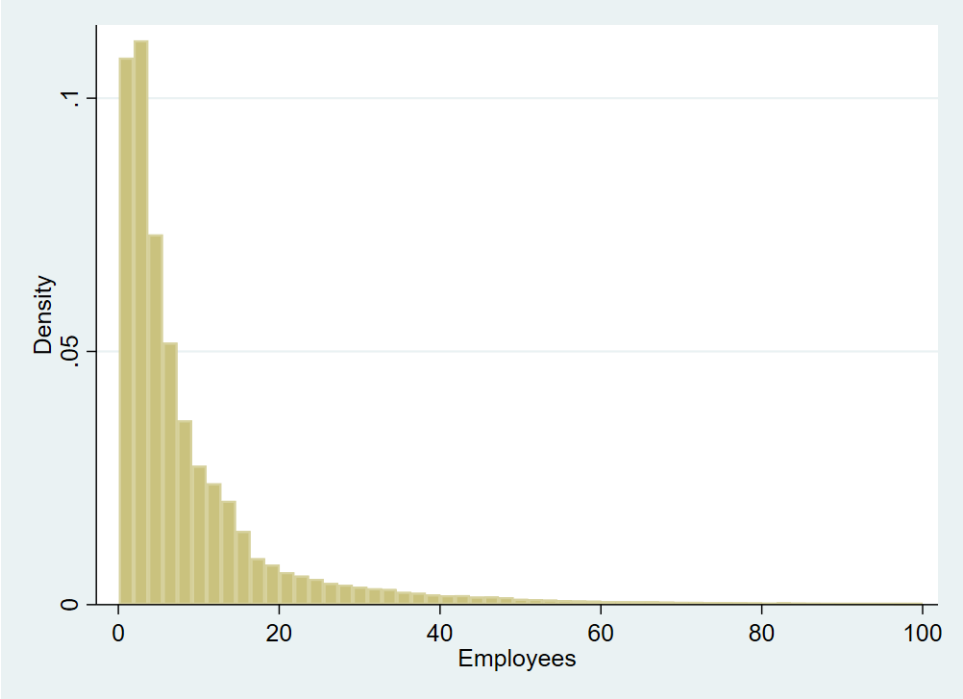

Figure 18: Density of Number of Employees in 2012

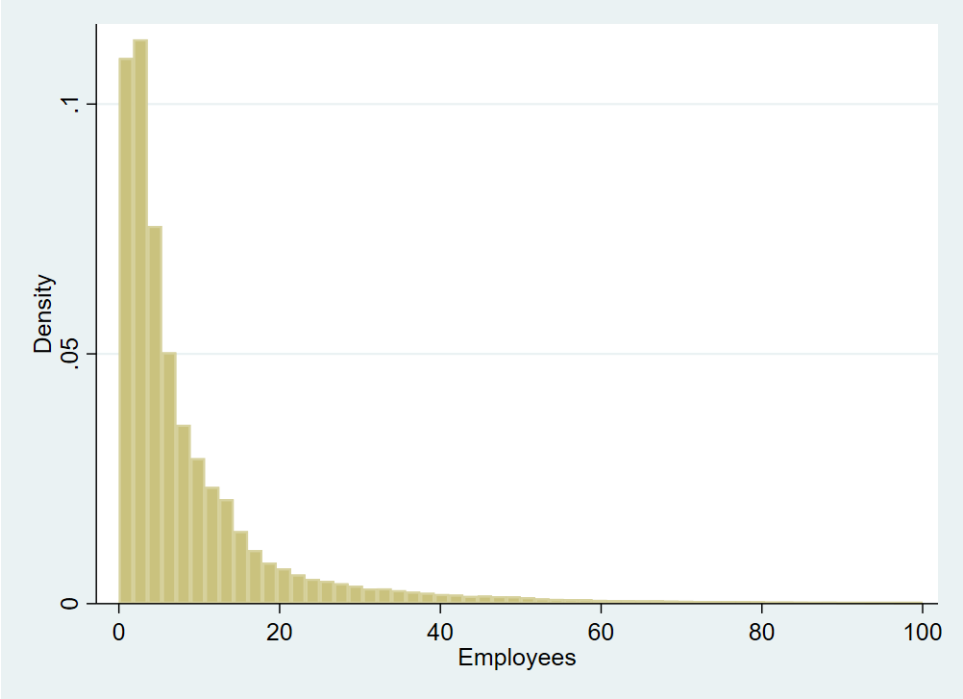

Figure 19: Density of Number of Employees in 2018

The above graphs show the density distribution of firm size for three representative years (i.e. 2005, 2012 and 2018), which appears virtually unchanged.

8 Summary

Business Dynamism can be defined as the ensemble of mechanics characterizing business birth, expansion, decline and exit. The main reason why business dynamism will be the subject of this study is that it is a crucial driver of the productivity-enhancing allocative process. The main aspect of business dynamism that will be investigated in this paper is job reallocation. I will show that this variable has declined in Italy over the recent years. The empirical strategy that I will follow to explain the job reallocation decline is best understood thinking at this problem through the lens of a simple model of firm dynamics. In standard models, job reallocation arises from the growth and survival response of businesses to their exogeneous productivity draws. Hence declining reallocation arises from either of two forces. Either a decline in the volatility of the productivity process, leading to a more predictable business environment which reduces reallocation by lowering firms' needs to alter their workforce. Or increased frictions on labor adjustments, which weaken the "responsiveness" of businesses to their productivity realization, since they make any labor adjustment more expensive. These two possible explanations refer to the "Shocks" and "Responsiveness" hypotheses.

The empirical strategy that I will follow, allows me to tell apart the two hypotheses by looking at several moments of interest which can reflect changes in the Total Factor Productivity (i.e. TFP) process or in the degree of frictions to labor adjustments. The main moments are: dispersion of firms' TFP, dispersion of firms' labor productivity and business growth and survival responsiveness to productivity realizations. Where TFP is estimated using the industry cost share as input elasticities. If the "Shocks" hypothesis were to be the right explanations, I would expect a decrease in TFP and Labor productivity dispersion; consistent with a more

tranquil business environment. Instead the "Responsiveness" hypothesis would be identified by a decline in employment responsiveness to TFP realization and a rise in Labor productivity dispersion, consistent with an increase in frictions making labor adjustments more costly. I will show that the empirical evidence drawn from these moments are consistent with an increase in adjustment frictions. This conclusion mirrors the findings of (Decker 2020, AER), this is my reference paper which conducts the analysis that I have just laid out for the United States economy over the 1980-2010 period.

After completing the first part of my thesis following the footsteps of my reference paper, I try to offer a novel contribution to the literature in the form of an explanation of the responsiveness decline. Because of data constraint, the only potential driver of the responsiveness decline that I am able to test is a potential change in the degree of competition. To show that decreasing competition may have led to dwindling responsiveness, I proceed in two steps. Firstly, I verify that competition has decreased over the period under study. Secondly, I check that there is a reduced-form relationship between a lower degree of competition and a more muted response of employment to a TFP realization. To study any change to the degree of competition I focus on two measure of competition: HHI and Markup. The latter was estimated following De Loecker (2020), using labor as the variable input and the Olley and Pakes procedure to retrieve the labor elasticity. Regarding the first step, I obtained mixed results: I found that the average HHI has increased leading to a more concentrated economy, but I found no significant changes in markup. Regarding the second step, I found strong evidence that the labor adjustment decision of firms with higher markup and of firms in more concentrated markets is less responsive to TFP realizations. The results, although not conclusive, indicate that declining competition is a valid candidate to explain the responsiveness decline. Finally I provided

several robustness checks on the fall of Job Reallocation (in the Appendix) and on most of the other results (in the Robustness section), by replicating the analysis with the TFP from the Olley and Pakes estimation procedure.