We are interested in understanding whether better managed firms seem to do a relatively better job of assembling the workforce.

Our starting point in the broader project we are working on, we are interested big picture in distinguishing between management as a tool for improving efficiency or things that management does that can increase productivity in terms of the size of the pie, and the role that management might play in altering rent capture, and the distribution of the surplus (split of the pie).

We know from the literature that there is a lot of dispersion across firms in terms of productivity, so there is a lot of dispersion in terms of the size of the pie to be split, and we know there is also dispersion across firms in terms of total compensation (some firms pay workers more than other firms do) so depending on where you end up can affect how much you get paid, which adds to inequality.

The third piece of this is that we know there is a lot of dispersion across firms in terms of workforce composition. We are trying to move into this literature thinking about the connection between management practices, pay , and hiring and firing. In particular, how firms assemble their workforce, and in doing so shed some light on the question of what the value is of firm recruiting and retention practices. This is a question that has a lot of speculation but relatively little empirical work.

In this paper we are focusing on the relative importance of management practices for recruiting the best workers (picking the best) and retention of only the best workers (shedding the rest).

To do this, we are going to link together three data sources. Linked employer employee data from Brazil, data on WMS Brazil, and also firm productivity data from PIA. This is a unique setting to explore our question because we can observe workers moving in and out of firms, and we can get a measure of worker quality (akm fixed effect), link those to firm management practices and see how those different measure relate to firm productivity.

Our approach: first of all, we are going to separately identify managers and production workers, which is a key feature of the Brazilian data (detailed occupation codes). We can then estimate AKM person effects separately for production workers and managers, and then use those to document the relationship between the firm's management structure, that is, the extent to which the firm is using structured management practices as defined by the WMS. Finally we focus on the movements of workers between well managed and poorly managed firms.

(Note: this is one important improvement on previous work on this topic, as the German data does not allow for identification of occupation and thus Card et al used the top quartile of pay as a definition of manager, which hinders the ability of doing a pay based analysis such as ours.)

There is a large lit that this is related, but there is still a hole here in terms of understanding how management relates to firm recruitment and retention decisions. We have mentioned that there is a developing literature looking at productivity and management, but particularly in terms of productivity and management, dispersion and the efficient use of inputs. Boyd and Curtis looked at WMS data and energy efficiency, and what we are doing is looking at the efficiency of human capital or labour input.

There is also developing literature thinking about team production and substitution, so thinking about the idea that it matters who the firm hires and in terms of assembling a team, being able to put together a productive team is difficult and affects the firm's bottom line, and it turns out it affects a lot when one worker leaves and who you are able to replace that worker with.

Also an important literature on sorting and matching. We know that assortative matching seems to be a key driver of inequality in the US, Brazil and Germany. So this is turning into one of those stylized facts, but we don't know why that sort of matching takes place and what the mechanisms in place are. We will be able to shed some light on that process and how that takes place.

There are a couple of directly related papers that are close to ours in that they combine some sort of linked employer employee data with management survey data. Bandiera et al (2015), Bender et al (2016).

Nick's q: I thought in AKM you are using the covariance between the firm and worker fixed effects. But you're talking about assortative matching. There's some chat between Nick and John, but not super important.

Ian: I read a lot of papers that Nick's claim that the correlation between worker and firm effects is negative, and that was definitely true of the early studies in this literature, using the french data, the original AKM paper, seems to have been part an artifact of … [?] most papers since then, though, also find a strong positive correlation in Brazil, and in fact that correlation is decreasing over time as inequality in Brazil falls, which is satisfying if you think that relationship should work that way. So in general in the cross section, and also in later work by Ian/John, found smaller but still positive correlations in the LEHD data.

To give an overview of results:

We will show that, consistent with previous literature, worker and manager quality are positively correlated with TFP.

Second, better managed firms end up capturing a higher share of employment over time, and it looks like, at least within WMS firms, the worse firms are losing market share while the best managed firms gain market share, consistent with a reallocation story.

We then see positive recruitment: we see both that better managed firms, when hiring, hire a larger share of their new recruits from the top of the distribution both in terms of managers and production workers. We also see this for retention, they tend to retain a larger share of higher quality workers over time.

Finally on the other margin, while better managed firms are less likely to fire workers more generally, suggesting perhaps that they find a way to make the matches more productive, they are also more selective in their firing. When they fire, their firing decisions are more strongly related to worker quality.

Then to tie it back to management practices, we find that in terms of the production workers, what a firm says that it does in terms of promotion and retention practices is strongly correlated with production worker quality. While some of the manager effects seem to be associated with operations management, so could be more of a selection story, it suggests that there is some correspondence between what firms say they do in terms of their management practices and what we see in the data.

[description of RAIS]

John comment: who says the reason for separation? Answer: the employer. Make sure we add this to a footnote.

Our measure of worker quality is a standard AKM wage decomposition. We are going to regress the log of wages on an experience profile interacted with race and gender, and we are going to take out a firm specific effect and a worker specific effect. The firm specific effect is measuring something like the treatment effect of a worker moving from one job to another. The firm effect measures how much more one gets paid if one moves from firm A to firm B. The statement is not uncontroversial, and if this was an AKM paper we would spend more time trying to convince you that this is actually not an unreasonable way to think about these firm effects, but what we are interested in is the theta-i, which is the value of the worker's portable skills as they move from job to job. So as a worker moves from job to job they have some traits and skills that have some value in the labour market, and they carry that along with them. That is what we will measure from this wage decomposition, and we are going to aggregate this both for the manager and production workers as measures of worker quality. With caveats of course.

Here's a kernel density of the average AKM worker fixed effects for managers and production workers, and what we see is that the quality measure for production workers has a lower mean and dispersion relative to the measure for managers.

[description of WMS] What is different that we do is that instead of looking at data-based cutoffs of firm ranking (ie. medians), we will look at a methodology-based cut-off and classifying firms as above and below the score of 3 in the WMS, which effectively distinguishes firms that have some sort of formal practice in place versus firms that have mainly informal practices in place. [for the paper we should probably put a table that shows the number of firms on each side of this cutoff, to show that we do have enough firms on either side?] While this is a little bit coarse, it is a clean distinction. We also use standardized measures.

It is unfortunate terminology in the Brazilian context because it shouldn't be confused with informal/formal firms and workers, but rather formal/informal practices. But bear with us.

Looking at the distribution of management scores, there is lots of dispersion. There are plenty of observations. On average firms don't use formal management practices, but again, plenty of dispersion. Someone mentioned “laws of management” and we see they apply in Brazil as well. This shows the correlation between standardized management score and stuff we can look at.

For example, there is a correlation between management and the firm fixed effect, worker fixed effect, they are larger, they have more workers with a college degree, their hiring rates are not that different, but they have lower separation rates. They have longer retention, higher tenure, and lower unionized share.

[PIA description]

FINDINGS

1. More productive firms use higher quality workers. Here's a binscatter showing the relationship between the average worker fixed effect and log of value added per worker. We see that the overall effects are all increasing in labour productivity. There is some heterogeneity in this relationship, these are residualized to take out employment.

In a regression table we can see the same pattern, as we have a regression of log sales on all the other factor inputs, but projecting on to overall management score as well as the avg person effect, or separate production worker and manager effects, we can see that again, firms that are more productive and have higher sales after conditioning on the factor inputs are employing higher quality workers. This validates the decision to call this a quality measure, if you employ higher paid workers you also tend to be getting higher output.

[Nick: do the worker effects on pre-sample so it is completely out of sample. But it doesn't matter too much.]

Raffaella: What does the inclusion of the management score do to these worker fixed effects?

We know the management score is positively correlated with the worker quality, and so if we take this out, the point estimates are consistent. We control for the fixed effect and appears to wipe out the production worker effect but these are all sort of jointly determinant so it is more telling us about the conditional correlations.

John: Nice to see how the point estimate changes. [has a comment that is probably important but I'm fiddling with paper. Ask Ian if he got it.]

2. We see that better managed firms capture a larger share of results. We take the management scores and carry them through the full sample of RAIS. Three separate panels, jobs in firms that are in the bottom tercile of the management distribution, jobs in the middle and top tercile of the distribution. If there was no reallocation, these would all sit at 33%. We see that at the bottom there is a clear loss in the share of employment apparently at the benefit of these best managed firms. This isn’t a direct reallocation because this is just a sample, but it tells us that over time that firms recorded as best managed in 2008 are picking up employment relative to worse managed firms.

[I wonder what happens if we just look at employment share of managers and production workers separately — ie. Are better managers moving over?]

John suggestion: You could do a similar thing, but with productivity instead. It would be a nice cross-check.

3. Moving on to hiring. Using the same structure of the data but we will now distinguish between the firms using formal vs informal practices. If we take all the firms that are hired in a given year, and look at the distribution of quality across all the workers that are hired somewhere, if we look at the top 20% of those hires and call them high ability, firms that are using best practices in 2008, are hiring a substantially higher share of these high ability workers relative to the poorly managed firms. This is true in every period, and it turns out that over time, just because better managed firms are getting larger they are picking up a larger share of low ability workers, too. Low ability workers are getting kicked out here, but that means the share of low ability workers increase over time too. But it shows that the good firms are being more selective.

The same plot for retention shows us that the better managed firms are retaining high ability workers much more than our poorly managed firms.

4. On the separation dimension, we see that firms with formal management practices match and fire more selectively. Let's focus on the right panel of production workers: we have the AKM fixed effects on the x-axis, a measure of worker quality. On the y-axis we have the firing rate, and the share of workers who are fired. The top lines are firms with informal processes, and the bottom lines are the firms with formal processes. Two things to observe here: first is that firms with formal processes are always less likely to fire workers relative to firms with informal processes. This is true for both production workers and managers. Somehow these firms feel less compelled to fire workers independent of their ability. However, when they do fire, you can see there is a slope difference in both of these lines. This suggests that firms that are using formal processes are much more selective. Their decision to hire is much more strongly associated with the quality of the worker that ends up being fired in the end.

John suggests that Nick's point on using the pre-WMS AKM data would be useful here.

Raffaella suggests that an alternative way would be to estimate the match effects. Take into consideration an additional term, like Kirabo Jackson. Do better managed firms take lower ability employees and then inject some quality into them.

The model ends up invoking some more assumptions, but it would be useful to do.

5. Last result says that selectivity seems to be associated with people management. We have regressions where we are projecting each of overall, manager or worker fixed effects on to management scores. We distinguish between operations and people management. We include firm and industry controls. For production workers, the variation seems to load on people management, while it is the opposite case for managers. Firms that have better operations management have most of the variation loading on to the operation management. This is telling us that perhaps for the managers this is a selection effect, where firms are selecting because they need good managers to help with operations. For production workers, it says something about the relationship that firms may be using their people management to improve production workers.

CONCLUSION

We started from the motivation that there is scant evidence thus far on whether personnel management structures actually translate into real differences in pay, hiring and firing practices. In particular, this is the first paper that can document these patterns separately for production workers and managers using individual-level occupation codes. We document these base relationships as a first step in a broader agenda.

We rank workers by their AKM person effects and identify the distribution of the ranked person effects of workers in poorly and well managed firms.

We document the relationship between management structures and pay, worker selection and productivity.

We document the flow of different worker types across poorly and well managed firms.

This is a first step in a broader agenda where we set the base for exploring issues of inequality, discrimination, and transmission of management via movement of workers and managers. It is an exciting research agenda ahead.