Joint Determination of Product and Labor Market Policies in a Model of Rent Creation and Division

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Abstract

We find that, across OECD countries, there is a strong link between the rate of self employment and the intensity of both product- and labor-market regulations. The sensitivity of the self-employment rate to regulation appears greater in terms of statistical significance and magnitude than the sensitivity of unemployment. We then develop a model of rent creation and division featuring product and labor market policies. The calibrated model accounts broadly for these features of the data. We also use the model to look at the effect of labor market and product market regulations on the different constituencies in the economy.

JEL Codes: D45, D72, E24, J65, L26, L51.

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1   Introduction

The extensive literature on transatlantic differences in labor market performance has suggested both labor market policies (LMP) and product market policies (PMP) as

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possible culprits. Blanchard and Giavazzi (2003) and Spector (2004) suggest that LMP and PMP should be analyzed in a common setting. For example, Blanchard and Giavazzi (2003) argue that a fruitful way to describe product and labor market policies and the interconnected way in which they affect the labor market is to recognize that product market regulations generate rents for the firm – as measured by the mark-up charged by firms, while labor market regulations determine how these rents are divided between firm and employees.

A feature of the labor market that has so far received relatively little attention is *self-employment.* Across the OECD, the self-employed comprise between 7% and 50% of the labor force – a larger share of the labor force than the unemployed. The self employed avoid LMP, because they do not employ other people, but also avoid PMP, as many of the provisions of widely-used PMP indicators apply only to firms with employees. Indeed, we find that self employment appears to be considerably more strongly related to LMP and PMP than is unemployment – and that there is no appreciable link between regulation and the number of firms with employees. These findings all suggest that a key channel though which the economy adjusts to increased regulation is by shifting workers between employment and self-employment, indicating that self employment may be key to understanding how the economy responds to regulation, and to understanding the redistribution of resources that results from regulation *in general equilibrium.* In particular, to the extent that they are immune from regulation, the self employed essentially exit the rent creation-redistribution game altogether.

The data examined tells us how regulations are correlated across countries and how labor market outcomes are correlated with each policy. However the high degree of correlation between product and labor market regulations makes it difficult to attribute a particular outcome to a particular policy. To dig further, we use quantitative theoretical analysis of the impact of policy.

We develop a quantitative general equilibrium model to analyze the creation and distribution of rents by these policies. The main features of the model are monopolistic competition in the goods market, and matching frictions in the labor market. Assuming monopolistic competition endogenizes the rents earned by firms and lets these rents be potentially affected by regulations. Matching frictions, combined with negotiations between firms and their employees, endogenize the division of rents between workers and firms. In addition, workers may be self employed. The decision to become an entrepreneur, rather than entering looking for employment in the labor market or being self-employed, is based on the cost of setting up a firm and on the ability to be self employed. Thus, there are two threshold values which jointly determine the occupational choice between entrepreneur, self-employed and

(regular) worker. The self-employed are immune from both firing costs and product market regulation, as suggested by the negative link between self employment and the regulatory indices, and as discussed in Tybout (2000) and Gollin (2006).

As opposed to the traditional matching framework, firms can have multiple workers. Since firms have market power, the marginal revenue product decreases with employment. Allowing wages to be the outcome of negotiations between the firm and the marginal worker, we obtain an expression linking the equilibrium wage with labor market tightness, and a mark-up expression that depends on labor market tightness and the number of competitors in the sector.[1] Equilibrium can be defined as an occupational choice decision and a labor market tightness value which jointly define the degree of competition in the goods market and tightness in the labor market. Both conditions are affected by labor and product market policies. This setup is appropriate for the study of reform, since it can be used to evaluate the joint effect of policies on the various constituencies inside the labor market (unemployed workers, employed workers, entrepreneurs and self-employed). One can use it to evaluate the transition to the new steady state following reform by keeping the number of competitors in the sector and the market tightness in the industry temporarily constant. Finally because we assume the economy to be comprised of several sectors, we can also the study partial reform of a single sector. This may matter since policies may also have redistributive effects across sectors, by inducing an adverse relative price effect for the reforming industry.

Section 2 explores the data, and Section 4 develops the model economy. Section 5 calibrates the model and presents our quantitative results. Section 6 concludes with a discussion of how various constituencies are affected by policy changes.

2   Empirical evidence

We first explore the cross country empirical relationship between several forms of labor market policy and product market policy (LMP and PMP). We concentrate on the OECD countries due to the relative abundance of data about their regulatory structure.

We look at two broad classes of regulation, LMP and PMP. LMP involves costs or restrictions on changing labor input, as well as policies that are conditional on a

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[1]See Stole and Zwiebel (1996). Interestingly, in our model, firing costs affect the firm not just because it increases expected operating costs, but also because it changes the terms of bargaining between a worker and its firms. Intuitively, when a firm bargains with a worker, the presence of a firing cost strengthens the hand of the worker in negotiations. As a result, firing costs become a potentially powerful redistributive tool even if firing itself is a rare event.

worker's labor market status. PMP involves costs or regulations imposed on other firm activities, e.g. management, sales or pricing.

2.1   LMP

We use the following indicators of LMP.

1. $EPL(O)_k$: Measures the intensity of employment protection legislation, that includes mandated severance pay, advance notice requirements. It is constructed by the OECD and its construction is discussed in Nicoletti et al (2000).[2]

2. $EPL(S)_k$: Also measures EPL, from Botero et al (2004). It is based on considering restrictions on hiring and firing a "similar" worker in different countries (for example, the worker is male, married, his spouse does not work, they have two children, reside in the largest city, and earn the equivalent of the country's GDP per capita). We include this alternative measure for robustness.

3. Rep_k: This is the replacement rate, as reported in the OECD database on Benefits and Wages.

2.2   PMP

We use the following indicators of PMP for each country k. Unless otherwise noted, they are drawn from (and their construction is discussed in) Nicoletti et al (2000).

1. $EC(O)_k$: Measures regulatory costs imposed on startups. It requires measuring certain types of regulation using surveys if goverernment regulators, and adding them using weights that reflect the extent to which there is variation along a given dimension in the data. The measure is mainly determined by "administrative burdens for corporations," "administrative burdens for sole proprietor firms," and "sector specific administrative burdens."

2. $EC(S)_k$: Measures the number of procedures required to start a company, and is drawn from Djankov et al (2002). The authors define a "standard" firm,

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[2]About 12% weight is given to severance pay. the rest of this index measures procedural inconveniences, notice and trial period, and difficulty of dismissal due to the possibility of reinstatement in case of unfair dismissal. At the same time, Garibaldi and Violante (2005) argue that severance pay does in fact make up the bulk of firing costs in terms of magnitude. Hence, later we provide several different approaches to modeling firing costs.

with a certain set of characteristics (such as not owning land, not producing a highly regulated product such as tobacco or financial services, not exporting, being based in the largest city, etc.) Then, they employ teams of lawyers to examine the statutes for starting this firm in each country, and compute the associated cost. We include this alternative measure for robustness.[3]

3. $STATE_k$: Measures state intervention in markets, for example via pricing restrictions, barriers to entering new markets and state control of business operations. Unlike EC(O), these represent costs that firms may incur throughout their lives, not just upon inception.

4. $TRADE_k$: Measures barriers to trade and foreign investment.

5. PMP_k: Measures product market regulation broadly, including entry costs, ongoing administrative costs and other costs. In particular, it is a factor weighted measure that includes EC(O), STATE and TRADE.

We mentioned in the begining that LMP and PMP may not apply equally to the self employed as to employer firms. By definition, firing restrictions do not apply to the self employed since they have no employees. As for PMP, there is a widespread sense that the self employed are lightly regulated in the literature on small enterprises, although hard data are hard to come by. For example, consider the retail sector, in which there is a lot of self employment. The data on which the Nicoletti et al (2000) indicators are based find that in most OECD countries retail units below a certain threshold are exempt from certain forms of regulation.[4] One of the features of the "standardized" firm used to develop the entry cost measure $EC(S)_k$ is that the firm has $10-50$ employees.

Perhaps more direct is the fact that the self employed often exit the formal economy altogether, and that the avoidance of regulation is a common reason offered for self employment in survey data (see Tybout (2000)).[5] The World Economic Forum measures the informal economy in any country k (Inf_k) as a share of GDP 2005-2007,

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[3]Djankov et al (2002) also contain a measure of the imputed cost of complying with these procedures as a percentage of GDP: that index does not correlate as strongly with other variables as $EC(S)_k$.

[4]This threshold varies from 200 to $20,000m^2$ $(2,150-215,000\ ft^2)$, depending on the country. The "raw" data from which the PMP indices are built note explicit exemptions from certain provisions of competition law for all small firms in Belgium and Japan. We are grateful to Michael Wise from the OECD for providing us with this data.

[5]We do not model the informal economy explicitly, but do assume that regulation does not apply to the self employed.

(see also Djankov et al (2009)). These numbers range from 12.1% (Finland) to 36.7% (Mexico). The correlation between Inf_k and $Self_k$ is fully 0.811. The correlation between Inf_k and PMP_k is 0.619, and that between Inf_k and $EPL(O)_k$ is 0.486.

3 Other variables

We develop some additional measures of LMP and PMP. First, Faggio and Nickell (2006) develop a year-by-year data set of $EPL(O)_k$. We use this to examine whether there is any significant time series variarion in LMP. In addition, Conway and Nicoletti (2006) develop industry-level measures of the impact of product market regulation on competition for a set of OECD countries, also reporting annual values 1960-2004. Their PMP measure reflects the estimated cost on any given industry of regulation both affecting that industry directly, and indirectly via upstream industries. We aggregate these to the country level by weighting each industry by value added, drawn from the STAN database. We look at two sets of aggregates, one for the entire economy and one for manufacturing only. We do not use these numbers for cross-sectional analysis because non-manufacturing data are only available for a few countries, whereas the manufacturing data represent a relatively small (and shrinking) share of the OECD economies: however, we believe it is adequate for painting an overall picture of international trends in product market regulation.

Finally, we also study certain labor and product market outcomes. To the extent that PMP creates barrers to entry, we might expect it to lead to fewer firms or, if the self employed are exempt from entry costs, to greater self employment. Also to the extent that LMP raises labor costs, we might expect higher unemployment and (to the extent that it is exempt from regulation) more self employment. We draw the number of firms per thousand people or "business density" Bus_k from Djankov et al (2009). Unemployment rates $Unemp_k$ are from OECD and are based on national statistics. Self-employment rates $Self_k$ are from Jütting and De Laiglesia (2009) and are based on national census survey data.

3.1 Results

Results are reported in Table 1 and Figure 1. Several interesting findings stand out from the data.

1. **Policy clustering:** As indicated in Blanchard and Giavazzi (2003), we find that many of the LMP measures and PMP measures are strongly correlated.

The broad PMP measure PMP_k, and entry cost measures, are positively correlated with LMP. The same is true of $STATE_k$, but not of $TRADE_k$. This suggests that policy clustering occurs among LMP, startup costs, and ongoing costs, but not costs related to international transactions. Replacement rates, while positively correlated with other EPL measures, are not correlated with PMP. As a result, in what follows we focus on the EPL measures and on the measures of PMP on entrants and on incumbents (as opposed to firms with international dealings).

2. **Policy clusters likely favor employed workers and/or the self employed, disfavoring both incumbents firms and new firms.** The correlation between entry costs and ongoing costs is strong and positive, suggesting that entry costs do not favor incumbents (since in high entry cost countries there are also high ongoing costs of operation).

3. **Entry costs, and ongoing PMP, are related to high self employment and high unemployment, but not to business density.** This suggests that measured PMP often does not apply (at least not as much) to the self employed.

4. **EPL is related to high self employment and high unemployment, but not to business density.** The first link is to be expected since by definition EPL does not apply to the self employed. The second is consistent with other studies, which tend to have trouble linking EPL to unemployment rates.

We conclude that LMP and PMP tend to occur together (comparing across OECD countries) and that the most common form of "clustering" involves EPL, entry costs and the ongoing costs of PMP. These policy clusters are positively related to self employment and to unemployment rates. This is consistent with the hypotheses in Lazear (1990) and Bertrand and Kramarz (2002) that LMP and PMP might deter employment: however, they also appear to encourage self employment, suggesting that self-employment is a way to avoid regulation.

Two further points are worth making. First, the cross country average rate of self employment is 18.2%, and its standard deviation is 0.60 of that. The average rate of unemployment is 7.2% and its standard deviation is 0.49 of that. Second, the statistical significance of the link between regulation and self employment is greater than (or similar to) that with unemployment. Thus, both in terms of magnitude and variation, the link between regulation and self employment is stronger than the link between regulation and unemployment. For example, an increase in $EPL(O)_k$ of one

standard deviation is linked to an increase in $Unemp_k$ of 1.05 percentage poins, and an increase in the rate of self employment of 6.25 percentage points. An increase in $EC(O)_k$ of one standard deviation is related to an increase in $Unemp_k$ of 1.75 percentage poins, and an increase in the rate of self employment of 6.57 percentage points. This suggests that to understand the impact of regulation on labor market outcomes may require considering self employment explicitly.

Moreover, the relative lack of data points and the presence of policy clustering means that it is difficult to attribute a particular outcome to a particular policy. For example, it could be that EPL impacts all of the labor market variables in question and PMP affects none, but the strong correlation between EPL and PMP would make it difficult to establish this. This is one of the reasons that applied quantitative analysis is a useful and appropriate tool to distinguish the effects of these policies.

Some economists argue that self employment is a sectorial characteristic – in other words, that countries may display different rates of self employment based on sectorial composition.[6] Establishing a link between self employment and industry composition on its own does not change the interpretation of our findings, as it could simply be that choosing to be self employed involves also a choice of industry – in other words, sectorial composition may be endogenous. KPMG and EIM (2000) argue that industry composition alone cannot account for cross-country differences in self employment, as there is a lot of variation within sectors also. However, OECD (2007) indicates that the tourist industry is one in which there are a lot of small firms (including self employment), and the size of the tourist industry is arguably exogenous to some extent – for example, based on the presence and characteristics of the coastline, latitude, etc. Moreover, the tourist industry represents a significant proportion of GDP in certain countries with high rates of self employment. Hence we can compare the size of the tourist industry in each coutry to rates of self employment and PMP.

We define the variable $Tourism_k$ as the share of tourism in service sector exports of country k, as reported by the OECD (2007). Self employment and tourism thus defined are indeed highly correlated (0.597***), although tourism and unemployment are not (0.266). Table 2 reports the statistical significance of regressing the labor market outcomes on the policy variables conditional on $Tourism_k$: the results of Table 1 are generally unaffected. This indicates that our results do not hinge solely on an exogenous component of self-employment related to tourism. At the same time, there is room for further interpretation. It could be that self employment is inherently more attractive in some countries than others (e.g. due to some exogenous

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[6]We are grateful to Chris Pissarides and Richard Rogerson for this observation.

component of industry composition) and that this is what drives the extent to which policies hinder other constituencies in a political equilibrium. Alternatively it could be a coincidence that industries with a lot of tourism are also highly regulated. We are agnostic as to this matter for the time being.

3.2   Some further results

We also used data from the OECD to construct a time-country panel of PMP and EPL. See Figures $2-4$. EPL hardly changes over time, with the exception of a small number of countries that underwent significant reform. PMP does display time variation, in that for most countries the measure begins to trend down after the late 1980s. At the same time, the *ranking* of countries according to these measures does not change significantly. These findings support our focus on cross-sectional comparisons (rather than time series variation).

Blanchard and Giavazzi (2003) make the following statements about policy reform sequencing:

1. PMP creates rents, and EPL distributes them to labor interests;

2. To reform EPL requires first reforming the PMP regime, after which (in the absence of rents) the resistance to EPL reform should diminish.

The data display a prolonged decline in PMP over time, whereas EPL does not seem to display time series variation. The decline in PMP over time is not due to structural shifts between services and manufacturing because the downward trend is also visible in data for manufacturing only (Figure 4). We conclude that either policy sequencing is an extremely slow process over several decades, that reform has so far simply been insufficient (certainly the reformed countries still remain much more regulated than the least regulated countries) or that there are other mechanisms at play beyond those discused in Blanchard and Giavazzi (2003).

4   Economic Environment

In this section, we develop a model economy with rent creation and distribution as well as self-employment. Agents choose whether to work, become self-employed or start a firm, depending on agent-specific costs and benefits. We distinguish conceptually between self employment and the creation of an employer firm: the self employed

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are agents who participate in the product market but not the labor market.[7] The notion that the self-employment decision is due to agent-specific costs and benefits has a long history, and Blanchflower (2000, 2004) finds evidence of the perceived benefits of freedom due to self employment (as well as the cost in stress) in survey data.

4.1 Basic structure

The economy is comprised of M sectors, each producing a differentiated good. Within each sector, firms are Cournot oligopolists. The number of firms/entrepreneurs within each sector is determined by agents' occupational choices. Agents may either run a firm (entrepreneurship), be employed, or be unemployed.

The optimal entrepreneurship decision varies among agents. Each agent is characterized by **a flow value** from self-employment h, which is drawn from a cumulative distribution function $F_h(.)$. Thus, an agent who has made the choice to become an entrepreneur receives h while remaining an entrepreneur. The variable h may be positive or negative, balancing for example the utility of being one's own boss (a commonly cited perk of entrepreneurship) against the demands in terms of time and stress. Each agent is also characterized by an ability to operate as a self-employed unit (ω), which is drawn from a **cumulative distribution function $F_\omega(.)$**.

An entrepreneur can start a firm with operating costs cl every period and produce zl, where l is the number of workers employed at that firm. Entry into entrepreneurship requires payment of an entry cost c_e, and firms break down exogenously at rate δ_e. In addition, individual workers separate from their firm at the exogenous rate δ_s. Denote the hazard rate for job loss $\delta \equiv \delta_e + (1 - \delta_e)\delta_s$.

Unemployed agents receive unemployment income b in real terms.

We represent the expected discounted utility of different activities in recursive form. To keep the notation simple, we suppress the sector index j except where necessary. Let V_u be the value of unemployment; $V_e(l; h)$ is the current value of being an entrepreneur; and $S_e(h)$ is the lifetime expected value of *setting up a firm* (at the time of firm creation), gross of entry costs. Finally, V_w is the value of being a worker.

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[7]Gollin (2006) defines self employment simply as a firm with labor input below unity. Gollin (2008) does not make the distinction. We model self employment as a different selection because of several reasons, but one is that Blanchflower (2004) indicates that the self employed in fact spend a significant amount of time working, more than the typical worker. In addition, although for now we focus on the model with out a continuous firm size distribution, we found that such a distribution would have a minimum firm size well above one unless entry costs, the unemployment benefit and the worker's bargaining power were all set almost to zero: Gollin (2006, 2008) do not have this problem because of the use of a frictionless environment without bargaining.

In principle, employer characteristics may influence the value of V_w if the wage varies across firms. The dependence here is implicit for notational simplicity. Later we will see that, since the wage received is independent of employer's characteristics, suppressing h is without loss of generality.

4.2   Goods market

Households are participating both in the goods and the labor markets. Describing the goods market first, consumers have preferences over M differentiated goods (sectors)

$$\left(\int_0^M \alpha_j^{1/\sigma} c_{j,n}^{\frac{\sigma-1}{\sigma}} \, dj \right)^{\frac{\sigma}{\sigma-1}},$$

where j denotes the good (sector) and n the household. The term σ is the elasticity of substitution across varieties. Their problem is to

$$\max_{\{c_{j,n}\}} \left(\int_0^M \alpha_j^{1/\sigma} c_{j,n}^{\frac{\sigma-1}{\sigma}} \, dj \right)^{\frac{\sigma}{\sigma-1}},$$

$$s.t. \int_0^M p_j c_{j,n} dj = PI_n,$$

where p_j is the price of good j, P the price index and I_n the real income of household n. For reasons of symmetry, assume that $\alpha_j = 1/M$ for all j. Solving that problem generates an aggregate demand for good j

$$Y_j^d = \frac{1}{M} \left(\frac{p_j}{P} \right)^{-\sigma} I, \tag{1}$$

where I is aggregate real income and the composite price index is $P \equiv (\frac{1}{M} \int_0^M p_j^{1-\sigma} dj)^{\frac{1}{1-\sigma}}$.

4.3   Workers

4.3.1   Unemployed workers

We have that $V_u = \frac{1}{1+r} \{ bP + p_w(\theta)V_w + (1 - p_w(\theta))V_u \}$ or

$$rV_u = bP + p_w(\theta)[V_w - V_u]. \tag{2}$$

4.3.2 Employed workers

The value of employment at a firm operating is given by $V_w = \frac{1}{1+r}\left[w + \delta V_u + (1-\delta)V_w\right]$
or

$$rV_w = w + \delta[V_u - V_w]. \tag{3}$$

4.4 Entrepreneurs

First, notice that due to symmetry across sectors, there is no reason for a firm or a worker to enter a sector rather than another.

Let us introduce some more notation. The index 'k' refers to a *particular* firm under consideration. For example, Y is aggregate output in a sector, y_k is output by firm k and Y_{-k} is output by all firms other than firm k in the sector [which will be taken as given by firm k and thus denoted $\widehat{Y}_{-k}$.]

Firms are assumed to play a Cournot game within their sector. Assuming so allows us to endogenize the degree of competition in each sector and thus in the economy. Using the aggregate demand for the sectorial good (eq. (1)), firm k faces a demand given by

$$\frac{p}{P} = \left(M\frac{y_k + \widehat{Y}_{-k}}{I}\right)^{\frac{-1}{\sigma}},$$

and, as a Cournot oligopolist, chooses its output realizing that its output together with the output of all other firms in the sector determine their relative price p/P.

Denote by $\varepsilon = -\frac{\partial y_k}{\partial p}\cdot\frac{p}{y_k}$ the elasticity of demand faced by that firm. One can check that $\varepsilon = \sigma Y/y_k$. The firm-level elasticity of demand is inversely proportional to that firm's share of sectorial output. Denoting by s that share, we have that

$$\varepsilon = \frac{\sigma}{s}.$$

Thus a larger firm faces a smaller elasticity of demand for its own product.

Consider the problem of a firm. For simplicity, a large number approximation is made and the change in employment at the firm level is assumed to be non-stochastic. In other terms, firms post the number of vacancies v required to reach in expectation their optimal firm size. A firm takes the wage function $w(l)$ as given and maximizes discounted profits, with a value function given by

$$V_e(l;h) = \max_{v,l'} \frac{1}{1+r}\left\{hP + zl\cdot p(l) - w(l)l - Pcl - \kappa Pv + (1-\delta_e)V_e(l';h) + \delta_e[S_e(h) - Pc_e]\right\},$$

$$\text{where} \quad \begin{cases} \frac{p(l)}{P} = \left(M \frac{zl + \widehat{Y}_{-k}}{I} \right)^{\frac{-1}{\sigma}}, \\ l' = p_f(\theta) \cdot v + (1 - \delta_s)l. \end{cases}$$

Notice that this differs in one way from Delacroix (2006): the term $\delta_e[S_e(h) - Pc_e]$ on the right-hand side (and of course the operating costs). What is important is that this term should not depend on the entrepreneur's current value of l (nor on l').

Notice also that the function $w(l)$ could potentially depend on the employer's characteristics (h, z, c). We establish in Appendix that in fact, $w(l)$ does not depend on any of them.

As our model closely follows Delacroix (2006), we relegate the derivation of the entrepreneurs' problem to the Appendix. Let us only point out that, given that each firm is in effect negotiating with multiple employees, we follow Ebell and Haefke (2009), Cahuc et al (2008), Felbermayr and Prat (2007) and Smith (1999) who use the intra-firm bargaining setup of Stole and Zwiebel (1996). In this framework, wages are bargained as if each firm were bargaining with the marginal worker, so that

$$\phi V'_e(l; h) = (1 - \phi)(V_w(l) - V_u). \tag{4}$$

Solving for the entrepreneurs' problem in Appendix, we find that in steady state

$$\frac{w}{P} = b + \frac{\phi}{1 - \phi} \frac{1}{1 - \delta_e} \frac{\kappa}{p_f(\theta)}(r + \delta + p_w(\theta)), \tag{5}$$

and

$$\frac{p}{P} = \frac{\varepsilon - \phi}{\varepsilon - 1} \frac{1}{z} \left\{ b + \frac{1}{1 - \phi} \frac{1}{1 - \delta_e} \frac{\kappa}{p_f(\theta)}(r + \delta + \phi p_w(\theta)) + c \right\}. \tag{6}$$

The second expression basically results from a markup condition. Of course

$$p/P = 1, \tag{7}$$

in equilibrium, due to symmetry across sectors.

It is to be noticed that the wage w/P does not depend on any of the employer's characteristics. This is usual in this type of model. As pointed out in Stole and Zwiebel (1996) and in Wolinsky (2000), the monopsony position enjoyed by firms negotiating with multiple workers implies that firms only compensate workers for their outside option. This property simplifies the analysis. In particular, that means that the value of employment is the same, regardless of the firm workers are employed at.

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4.5 The self employed

By being self-employed, agents avoid the various labor market and product market regulations. The self-employed do not suffer breakdowns (or, if they did, they could simply restart). Thus,

$$rV_{se}(\omega) = pz - P\omega.$$

Gollin (2008) provides a model of the self employed with choice of labor input. We abstract from this (essentially assuming that labor input is maximal) based on the evidence of Blanchflower (2004) that the labor input of the self-employed generally exceeds that of the employed.

4.6 Occupational choice

For this section, we take a bit of liberty with the notation and at first use both agents characteristics (h, ω) as arguments even if they are not both relevant conditional on a choice having been made. Proceeding like that helps with describing the occupational choice.

We have

$$\begin{aligned}(1+r)V_e(h,\omega) = \quad & hP + \pi + (1-\delta_e)V_e(h,\omega) \\ & +\delta_e.\max\{S_e(h,\omega) - Pc_e, V_u, V_{se}(h,\omega)\},\end{aligned}$$

where π is profit.

The occupational decision is based on choice in the max operator:

$$\begin{cases} \text{Ent.} \gg \text{W}, & \text{if } S_e(h,\omega) - Pc_e > V_u, \\ \text{Ent.} \gg \text{SE}, & \text{if } S_e(h,\omega) - Pc_e > V_{se}(h,\omega), \\ \text{SE} \gg \text{W}, & \text{if } V_{se}(h,\omega) > V_u. \end{cases}$$

The value S_e of setting a firm gross of entry cost is such that

$$S_e = V_e - \text{``reset costs''} = V_e - \rho,$$

where the reset costs are the costs of re-hiring your workforce, i.e. $\rho = \kappa Pl/p_f(\theta)$.

Clearly, S_e does not depend on ω and V_{se} does not depend on h. Define $\widehat{h}$ and $\widehat{\omega}$ so that

$$\begin{cases} S_e(\widehat{h}) - Pc_e = V_u, & \implies \text{Ent.} \gg \text{W} \quad \text{if } h > \widehat{h}, \\ V_{se}(\widehat{\omega}) = V_u, & \implies \text{SE} \gg \text{W} \quad \text{if } \omega > \widehat{\omega}. \end{cases}$$

The threshold values are given by

$$\begin{cases} \widehat{h} + \pi - (r + \delta_e)(Pc_e + \rho) = rV_u, \\ pz - P\widehat{\omega} = rV_u. \end{cases}$$

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What governs the choice of SE vs. entrepreneurship? Agents choose entrepreneurship if $S_e(h) - Pc_e > V_{se}(\omega)$, i.e. if

$$h + \omega > \widehat{h} + \widehat{\omega}.$$

This means that in (h, ω)-space can be divided in three regions (workers, entrepreneurs and self-employed) that are perfectly defined by the values $(\widehat{h}, \widehat{\omega})$. See Figure 5 for a graphical representation of the occupational choice decision.

4.7 Steady state conditions

Define the proportions of entrepreneurs, self-employed and (regular) workers among the total labor force $\overline{L}$ as μ_e, μ_{se} and μ_w, respectively. These can be computed from $(\widehat{h}, \widehat{\omega})$ and the distributions $F_h(.)$ and $F_\omega(.)$.

We know that $\varepsilon = \sigma/s$. Taking into account entrepreneurs and self-employed **to compute the individual share of sectorial output**, we have that

$$\varepsilon = \overline{\sigma}.[\mu_e + \mu_{se}/l],$$

where $\overline{\sigma} = \sigma \overline{L}/M$.

Also, since

$$\underbrace{\mu_e}_{\substack{\# \ of \\ entrepreneurs}} \cdot \underbrace{l}_{\substack{firm \\ employment}} = \underbrace{\mu_w}_{\substack{\# \ of \\ workers}} \cdot \underbrace{\frac{p_w(\theta)}{\delta + p_w(\theta)}}_{\substack{employment \\ rate}} ,$$

then

$$l = \frac{\mu_w}{\mu_e} \cdot \frac{p_w(\theta)}{\delta + p_w(\theta)}.$$

4.8 With firing costs

The derivation of the model is very similar when adding firing costs per employee t. We model them as a cost firms *expect* to pay after any separation. The derivation in the sections above is affected in two ways.

First, the firm's problem becomes:

$$V_e(l; h) = \max_{v, l'} \frac{1}{1+r} \left\{ \begin{array}{l} hP + zl.p(l) - w(l)l - Pcl - \delta_s lPt - \kappa Pv \\ +(1 - \delta_e)V_e(l'; h) + \delta_e[S_e(h) - lPt - Pc_e], \end{array} \right\},$$

subject to the same constraints.

The firm expects to have to pay $\delta_s Pt$ per employee each period, and also takes into account that upon firm breakdown, it will have to pay firing costs Pt on all its employees. In effect, this is equivalent to the same problem as in section 4.4, with operating costs augmented by the expected firing costs. Thus, by denoting $c' = c + (\delta_e + \delta_s)t$, we can solve the same problem as before, with firms facing operating costs c' instead of c.

Second, the intra-firm bargaining must reflect that upon breakdown of negotiations and separation, the firm is liable for the cost t. The microfoundations of the setup described in Stole and Zwiebel (1996) imply that the bargaining rule is now

$$\phi(V'_e(l;h) + t) = (1 - \phi)(V_w(l) - V_u). \tag{8}$$

We can thus proceed to solve as before. For simplicity of exposition, the results are described in Appendix.

In the numerical work, we also consider the case where the bargaining rule is unchanged.

5 Quantitative Results

5.1 Calibration

We calibrate the economy to match certain moments from a relatively unregulated OECD economy, and then change LMP and PMP to examine changes in labor market structure and also to consider how different constituencies fare under various policy changes. We select the United States as the benchmark economy. We intend to present a calibration to a regulated European economy also, for robustness.

The most important moments we wish to match are those that affect the size and sensivity of the shares of the labor force comprised by different occupations.

We begin by setting $z = 1$, which amounts to a normalization. We set the monthly discount rate $r = 0.04/12$. We select δ_e and δ_s to target firm and individual match expected durations, specifically a 7-year firm survival probability of 45%, and a median job tenure of 4.2 years.

- We set $\eta = .5$ (see Pissarides and Petrongolo (2001)). The matching intercept is chosen to match average unemployment duration. This implies that $\theta = .45$ as in Shimer (2005).

- We set $\kappa = 1$ (so that average recruitment costs ≈ 1.5 month of earnings).

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- Policy parameters: in our benchmark economy, we set $b = .3$ (Shimer (2005)), and also tried $b = .6$ for robustness. We set $c_e = 20\%$ of monthly per capita income (which is about the value for the US reported in Djankov et al (2002)). We set the firing cost $t = 0$.

- We wish to match an equilibrium markup of 15%, which is a value commonly reported in the literature and which is consistent with the detailed estimates of Oliveira, Scarpetta and Pilat (1996). The "markup condition" then pins down operating cost $c = .2298$.

- $\phi = .4333$ chosen to match the wage share of income, which we set to 0.67.

- We choose values of $\mu_e = 3.9\%$ and $\mu_{se} = 7.4\%$. These are the values based on U.S. data. They imply that $l = 21.5$ and, given that $\varepsilon = \overline{\sigma}.[\mu_e + \mu_{se}/l]$, this also pins down the value of $\overline{\sigma}$.

- We set the distributions $F_\omega(.)$ and $F_h(.)$ to be uniform, with robustness analysis on the range. The equilibrium values of $(z, V_u(\theta))$ imply the threshold $\widehat{\omega}$, and the firm entry condition implies the threshold $\widehat{h}$ within these ranges.

5.2   Results

In what follows we change different policies individually to assess their impact on the benchmark economy. When the markup over cost increases, we think of that as reflecting the regree of competition in the economy.

5.2.1   Firing Costs

First, consider firing costs that enter the bargaining rule. We find that changing firing costs from 0 to 3 months of output (equivalent to varying it from 0 to 4.5 months of wages) suppresses the share of firms per capita by 0.3 percentage points. It is not a small change relative to the benchmark value of 3.9%: however, relative to the labor force, it is a small difference because the share of entrepreneurs is small to begin with. See Table 3.

The share of self employed agents changes dramatically, from 7% to almost 20% of the labor force. The unemployment rate also changes significantly when the firing cost enters the bargaining rule, but less so when it does not (Table 4). Interestingly, markups do not change very much and wages decrease. Markups decrease when firing costs do not affect the bargaining rule, as firing costs simply increase the costs of production. In the case in which firing costs also affect bargaining, markups actually

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increase as, in this case, the number of firms decreases more significantly. The data are most consistent with the second form of firing costs (i.e. when they do not change the bargaining rule) in that unemployment is less responsive than self employment.

5.2.2 Entry Costs

See Table 5. We raise the entry costs from 20% of monthly per capita GDP to 6 months of per capita GDP – on the high end of the entry costs reported in Djankov et al (2002). We find that, surprisingly, the composition of the labor market changes very little in response.[8] Higher entry costs increase the rate of self employment, and also increase somewhat the markup. They hardly change rates of entrepreneurship and unemployment. This is consistent with the data, but the effect is quantitatively weak.

5.2.3 Flow (ongoing) Costs

See Table 6. Increasing flow costs from 0.0 to 0.1[9] has little impact on unemployment and the rate of entrepreneurship. The rate of self employment, however, increases significantly. This is consistent with the overall pattern of the relationship between regulation and outcomes in the data. Ongoing costs decrease markups, however, because the attendant increase in costs is not offset by a decrease in the number of firms competing. Thus, it would appear that no agents benefit from this form of regulation.

5.2.4 Replacement Rates

See Table 7. We find that increasing replacement rates from $b = 0.3$ to 0.5 has negligible effect on entrepreneurship. Self employment declines by about 2%, and unemployment increases somewhat also. All of these changes are of much smaller magnitude than those induced by firing costs, however.

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[8]Still, this is consistent with Ebell and Haefke (2009) who find little effect of product market reform on unemployment on a calibrated U.S. economy. They do not have occupational choice in their model.

[9]To get a sense of magnitudes, the technological cost c that leads to the calibrated average firm size is about 0.23.

6 Policy changes and constituencies

To sum up, the two policies that seem to account for the cross-country labor market differences explored in Section 2 are firing costs and ongoing PMP costs. However, each kind of policy benefits different groups. Understanding what occupations benefit or lose from different policies is an important step in understanding the likely origins of potentially costly forms of regulation.

6.1 First results

To preliminarily discuss the relative benefits of policy to different constituencies, we examine the impact of policy on agents based on their occupational choice, putting aside the issue that occupational choice is endogenous.

First of all, the **self employed** in our model are unaffected by policy, so they **are indifferent about regulation** unless it leads some of the self employed to voluntarily shoft to another occupation.

Second, the employed turn out to be negatively affected by EPL. This is because the costs of EPL reduce the surplus within the match, and this turns out to overwhelm any benefits to workers from changes in their bargaining power. For the same reason, **the employed dislike ongoing PMP**. **Entrepreneurs dislike these regulations too**, since they represent costs, weaken their bargaining position, or both.

We find that reform of entry costs would be viewed (weakly) favorably by workers, but not by entrepreneurs. Even though the effect is limited in our quantitaive analysis, there is a small positive wage effect, without much change in unemployment. Whether this explains why product market reform has been carried out in a number of countries (yet not labor market reform) is an intriguing possibility that deserves further exploration.

We find that workers dislike reform in unemployment benefits, while entrepreneurs would welcome it. It would be interesting to see if this results survived if employed workers were taxed to finance these benefits. We intend to study that question soon.

6.2 Future work

These preliminary results lead to many further questions.

First, the costs imposed by regulation seem to outweigh the benefits, even to specific constituencies. It could it be that an **unmodelled constituency** in fact

benefits from regulation. For example, Djankov et al (2002) argue that the regulation of entry is likely due to its use by government officials to raise funds for own use, suggesting that the "missing constituency" (if there is one) might be the government itself.

Second, it could be that our model is **missing** an important **margin of adjustment**. In particular, neither EPL nor PMP affects rates of entry and exit, nor rates of job creation and destruction. Endogenizing these margins would be wothwhile pursuing, although challenging.

Third, so far we have abstracted from the possibility of **partial reform** (i.e. at the industry level). It could be that, given that the reaction to a given industry to one form of regulation depends on whether or not other industries are regulated. Our framework is suitable for the analysis of partial regulation and reform, as in Delacroix (2006).

Finally, why do some countries have stringent product and labor market regulations, while others have looser regulations? What **exogenous sources variation** across countries might account for this feature of the data? Possibilities include differences in the ease of self employment (e.g. due to differences in industry composition), exogenous historical differences (multiple equilibria), or different exogenous political processes.

7 References

Bertrand, Marianne and Francis Kramarz, 2002. Does Entry Regulation Hinder Job Creation? Evidence From The French Retail Industry. Quarterly Journal of Economics, 117(4), 1369-1413.

Blanchard, Olivier and Francesco Giavazzi, 2003. Macroeconomic Effects Of Regulation And Deregulation In Goods And Labor Markets. The Quarterly Journal of Economics, 118(3), 879-907.

Blanchflower, David G. 2000. Self-employment in OECD countries. Labour Economics 7(5), 471-505.

Blanchflower, David G. 2004. Self-Employment: More may not be better. NBER Working Papers 10286, National Bureau of Economic Research, Inc.

Botero, J., S. Djankov, R. La Porta, F. Lopez-de-Silanes and A. Shleifer. 2004. The Regulation of Labor. Quarterly Journal of Economics 119(4), 1339-1382.

Cahuc, Pierre, Francois Marque and Etienne Wasmer, 2008. A Theory Of Wages And Labor Demand With Intra-Firm Bargaining And Matching Frictions. International Economic Review, 49(3), 943-972.

Conway, P. and G. Nicoletti. 2006. Product Market Regulation in the Non-Manufacturing Sectors of OECD Countries: Measurement and Highlights. OECD Economics Department Working Paper, No 530.

Delacroix, Alain. 2006. A Multisectorial Matching Model of Unions. Journal of Monetary Economics 53, 573-596.

Djankov, S., R. La Porta, and F. Lopez-de-Silanes and A. Shleifer. 2002. The Regulation of Entry. Quarterly Journal of Economics 117(1), 1-37.

Djankov, S., T. Ganser, C. McLiesh, R. Ramalho and A. Shleifer. 2009. The Effect of Corporate Taxes on Investment and Entrepreneurship. Mimeo: Harvard University.

Ebell, Monique and Christian Haefke. 2009. Product Market Deregulation and the U.S. Employment Miracle. Review of Economic Dynamics 12(3), 479-504.

Faggio, G. and S. Nickell. 2006. Patterns of Work Across the OECD. CEP Discussion Paper No. 730.

Felbermayr, Gabriel and Julien Prat, 2007. Product Market Regulation, Firm Selection and Unemployment. IZA Discussion Papers 2754, Institute for the Study of Labor (IZA).

Garibaldi, Pietro and Giovanni L. Violante. 2005. The Employment Effects of Severance Payments with Wage Rigidities. Economic Journal 115, 799-832.

Gollin, Douglas, 2002. "Getting Income Shares Right." Journal of Political Economy 110(2) April 2002: 458-474.

Gollin, Douglas, 2006. Do Taxes on large Firms Impede Growth? Evidence from Ghana. Mimeo: Williams College.

Gollin, Douglas, 2008. Nobody's business but my own: Self-employment and small enterprise in economic development. Journal of Monetary Economics, 55(2), 219-233.

Jütting, Johannes P. and Juan R. De Laiglesia. 2009. Is Informal Normal? OECD Development Center.

KPMG and EIM, 2000. The European Observatory for SMEs: Sixth Report. Luxembourg: European Commission.

Lazear, Edward P, 1990. Job Security Provisions and Employment. Quarterly Journal of Economics, 105(3), 699-726.

Nicoletti, Giuseppe, Stefano Scarpetta and Olivier Boylaud, 2000. Summary Indicators of Product Market Regulation with an Extension to Employment Protection Legislation. OECD Economics Department Working Papers 226, OECD, Economics Department.

OECD, 2007. Tourism in OECD Countries 2008: Trends and Policies. Paris: OECD.

Oliveira Martins, Joaquim, Stefano Scarpetta and Dirk Pilat, 1996. "Mark-Up Ratios in Manufacturing Industries: Estimates for 14 OECD Countries," OECD Economics Department Working Papers 162, OECD Economics Department.

Petrongolo, Barbara and Christopher A. Pissarides. 2001. Looking into the Black Box: A Survey of the Matching Function. Journal of Economic Literature 39(2), 390-431.

Shimer, Robert. 2005. The Cyclical Behavior of Equilibrium Unemployment and Vacancies. American Economic Review, 95(1): 25-49.

Smith, Eric. 1999. Search, Concave Production, and Optimal Firm Size. Review of Economic Dynamics 2(2), 456-471.

Spector, David. 2004. Competition and the capital-labor conflict. European Economic Review 48, 25-38.

Stole, Lars A. and Jeffrey Zwiebel. 1996. Intra-Firm Bargaining under Non-Binding Contracts. Review of Economic Studies 63(3), 375-410.

Tybout, James R. 2000. Manufacturing Firms in Developing Countries: How Well do They do and Why? Journal of Economic Literature 38(1), 11-44, .

Wolinsky, Asher. 2000. A Theory of the Firm with Non-Binding Employment Contracts. Econometrica 68(4), 875-910.

A   Appendix: solving the entrepreneurs' problem.

The first order condition with respect to vacancies is

$$\frac{\kappa P}{p_f(\theta)} = (1 - \delta_e) \, V_e'(l'; h). \tag{9}$$

The equation states that firms post vacancies until expected search costs are equal to the marginal contribution of an additional worker to firm value.

The envelope condition with respect to l expressed at steady state firm employment is

$$V_e'(l; h) = \frac{1}{r + \delta} \frac{d \left[z l p(l) - w(l) l - P c l \right]}{dl},$$

This defines the marginal gain to an entrepreneur from an additional employee. It of course depends on the firm-level elasticity of demand, which we can see by rewriting this expression as

$$V_e'(l; h) = \frac{1}{r + \delta} \left[z \frac{\varepsilon - 1}{\varepsilon} p(l) - \frac{\partial w(l) l}{\partial l} - P c \right].$$

Combined with the first order condition, we get

$$\frac{p(l)}{P} = \frac{1}{z}\frac{\varepsilon}{\varepsilon - 1}\left\{\frac{r + \delta}{1 - \delta_e}\frac{\kappa}{p_f(\theta)} + \frac{\partial w(l)l/P}{\partial l} + c\right\}.$$

The term $\varepsilon/(\varepsilon - 1)$ can be interpreted as the markup over *overall* marginal cost, inclusive of vacancy posting costs and changes in the firm's real wage bill and operating costs.

Turning to wage determination, each worker is treated as the marginal worker. Hence, equating the weighted surpluses

$$\phi V_e'(l; h) = (1 - \phi)(V_w(l) - V_u),$$

where ϕ is the worker's bargaining power. After some algebra, the above equation gives us

$$\phi l\frac{\partial w(l)}{\partial l} + w(l) - \phi z\frac{\varepsilon - 1}{\varepsilon}p(l) - (1 - \phi)rV_u + \phi Pc = 0.$$

This is the same equation as in Delacroix (2006), except for the term reflecting the operating costs (ϕPc). We can thus proceed to solve the differential equation as in Delacroix (2006) and obtain that

$$\frac{w(l)}{P} = \phi\frac{\varepsilon - 1}{\varepsilon - \phi}z\frac{p(l)}{P} + (1 - \phi)\frac{rV_u}{P} - \phi c.$$

This implies that $\frac{\partial w(l)}{\partial l} = -\frac{\phi}{\varepsilon}\frac{\varepsilon - 1}{\varepsilon - \phi}z\frac{p(l)}{l} < 0$. Inserting this into the "markup condition", we get

$$\frac{w(l)}{P} = \frac{\varepsilon - 1}{\varepsilon - \phi}z\frac{p(l)}{P} - \frac{\kappa}{p_f(\theta)}\frac{r + \delta}{1 - \delta_e} - c.$$

Combining the above two equations, we get

$$\frac{w}{P} = \frac{\kappa}{p_f(\theta)}\frac{\phi}{1 - \phi}\frac{r + \delta}{1 - \delta_e} + \frac{rV_u}{P}.$$

We can thus combine (2) and (3) to express V_u as a function of w to obtain simple expressions for w/P and p/P:

$$\begin{cases} \frac{w}{P} = b + \frac{\phi}{1 - \phi}\frac{1}{1 - \delta_e}\frac{\kappa}{p_f(\theta)}(r + \delta + p_w(\theta)), \\ \frac{p}{P} = \frac{\varepsilon - \phi}{\varepsilon - 1}\frac{1}{z}\left\{b + \frac{1}{1 - \phi}\frac{1}{1 - \delta_e}\frac{\kappa}{p_f(\theta)}(r + \delta + \phi p_w(\theta)) + c\right\}. \end{cases}$$

B   Appendix: the model with firing costs

The derivation follows exactly the method above and we find

$$
\begin{cases}
\frac{w}{P} = b + \frac{\phi}{1-\phi}\{\frac{1}{1-\delta_e}\frac{\kappa}{p_f(\theta)} + t\}(r + \delta + p_w(\theta)), \\
\frac{p}{P} = \frac{\varepsilon-\phi}{\varepsilon-1}\frac{1}{z}\left\{b + \frac{1}{1-\phi}\frac{1}{1-\delta_e}\frac{\kappa}{p_f(\theta)}(r + \delta + \phi p_w(\theta)) + \frac{\phi}{1-\phi}(r + \delta + p_w(\theta))t + c'\right\}.
\end{cases}
$$

One can verify that by setting $t = 0$, we find the same expression as in the section above.

Tables and Figures

	Variable	LMP		PMP					OUTCOMES		
		EPL(S)	Rep	PMP	EC(O)	EC(S)	State	Trade	Bus	Self	Unemp
LMP	EPL(O)	0.542***	0.452**	0.520***	0.600***	0.542***	0.601***	0.160	0.047	0.560***	0.278
	EPL(S)		0.354*	0.583***	0.701***	0.543***	0.670***	0.059	0.064	0.377**	0.409**
	Rep			-0.007	0,065	-0.073	0.111	-0.038	-0.208	-0.301	0.042
PMP	PMP				0.781***	0.613***	0.809***	0.612***	-0.026	0.600***	0.732***
	EC(O)					0.641***	0.539***	0.315	-0.150	0.494***	0.598***
	EC(S)						0.433**	0.248	0.060	0.554***	0.334
	State							0.417**	0.080	0.436**	0.555***
	Trade								-0.057	0.329*	0.397**
OUTCOMES	Bus									0.029	0.035
	Self										0.172

Table 1 – Correlations between EPL, PMP and labor/product market outcomes.
Standard errors are reported in parentheses. One, two and three asterisks
represent significance at the 10, 5 and 1% levels respectively.

	OUTCOMES	
Variable	Self	Unemp
EPL(O)	**	X
Tourism	**	X
EPL(S)	*	*
Tourism	***	X
Rep	X	X
Tourism	X	X
PMP	***	***
Tourism	**	X
EC(O)	***	**
Tourism	***	X
EC(S)	***	X
Tourism	***	X
State	*	**
Tourism	***	X
Trade	X	*
Tourism	***	X

Table 2 – Significance of the link between LMP/PMP and labor market outcomes, conditional on the share of tourism in service sector exports. "X" represents significance below the 10% level.

Changes in firing costs:

(fc does not affect firm surplus.)

	% Ent.	% SE	U%	Unemp. Dur	Markup	Wage share
fc = 0	3,9	7,4	4,6	2,4	15,0	66,7
fc = 1	3,8	10,0	4,7	2,5	14,9	64,8
fc = 2	3,7	12,7	4,8	2,5	14,8	62,9
fc = 3	3,6	15,3	4,9	2,6	14,7	61,0

Corr. in data:	0	+	weak +			
Model:	-	+	weak +	+	-	-

% entrepreneurship less sensitive than %SE.

Table 3 - Impact of firing costs in the calibrated economy. Firing costs do not affect the bargaining rule.

Changes in firing costs:

(fc affects firm surplus.)

	% Ent.	% SE	U%	Unemp. Dur.	Markup	Wage share
fc = 0	3,9	7,4	4,6	2,4	15,0	66,7
fc = 1	3,8	10,4	7,2	3,9	15,1	65,6
fc = 2	3,5	14,4	11,0	6,2	15,2	64,1
fc = 3	3,3	19,1	15,7	9,4	15,3	62,4

Corr. in data:	0	+	weak +			
Model:	-	+	+	+	+	-

% entrepreneurship less sensitive than %SE.

Table 4 – Impact of firing costs in the calibrated economy. Firing costs do affect the bargaining rule.

Changes in entry costs:

(months of individual GDP)

	% Ent.	% SE	U%	Unemp. Dur.	Markup	Wage share
ce = .2 months	3,9	7,4	4,6	2,4	15,0	66,7
ce = 2.4 months	3,9	7,5	4,6	2,4	15,1	66,6
ce = 6 months	3,9	7,6	4,6	2,4	15,3	66,5

Corr. in data:	0	+	+			
Model:	~ 0	~ 0	0	0	+	~ 0

Table 5 – Impact of entry costs in the calibrated economy.

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Changes in ongoing regulatory costs:

	% Ent.	% SE	U%	Unemp. Dur.	Markup	Wage share
Flow reg cost = 0	3,9	7,4	4,6	2,4	15,0	66,7
Flow reg cost = .05	3,7	14,0	4,9	2,6	14,7	62,0
Flow reg cost = .1	3,4	20,5	5,3	2,8	14,5	57,3
(oper. costs = .2298)						

Corr. in data:	0	+	+			
Model:	-	+	+	+	-	-

% Entrepreneurship less sensitive than %SE.

Table 6 – Impact of ongoing costs in the calibrated economy.

Changes in unemployment income:

	% Ent.	% SE	U%	Unemp. Dur.	Markup	Wage share
b = .3	3,9	7,4	4,6	2,4	15,0	66,7
b = .4	4,0	6,6	5,3	2,8	15,1	67,0
b = .5	4,0	5,6	6,6	3,5	15,2	67,4

Corr. in data:	weak -	weak -	0			
Model:	0	-	+	+	+	+

Table 7 – Impact of replacement rates in the calibrated economy.

Changes in workers' bargaining power:

	% Ent.	% SE	U%	Unemp. Dur	Markup	Wage share
phi = .4333	3,9	7,4	4,6	2,4	15,0	66,7
phi = .4	4,0	7,7	4,3	2,3	14,5	66,3
phi = .35	4,2	8,3	3,9	2,0	13,9	65,7

Model:	+	+	-	-	-	-

Table 8 – Impact of the bargaining parameter in the calibrated economy.
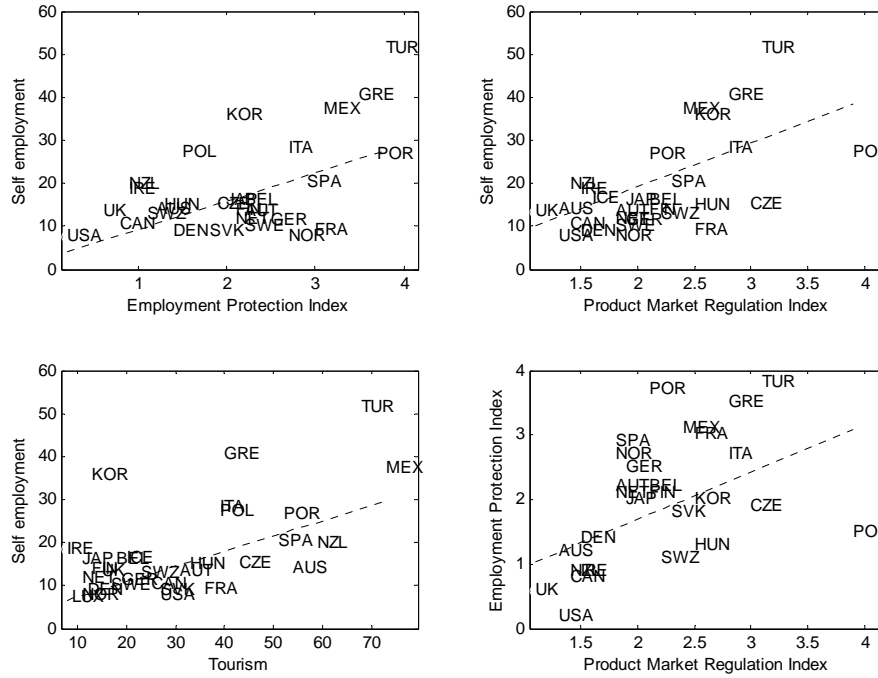
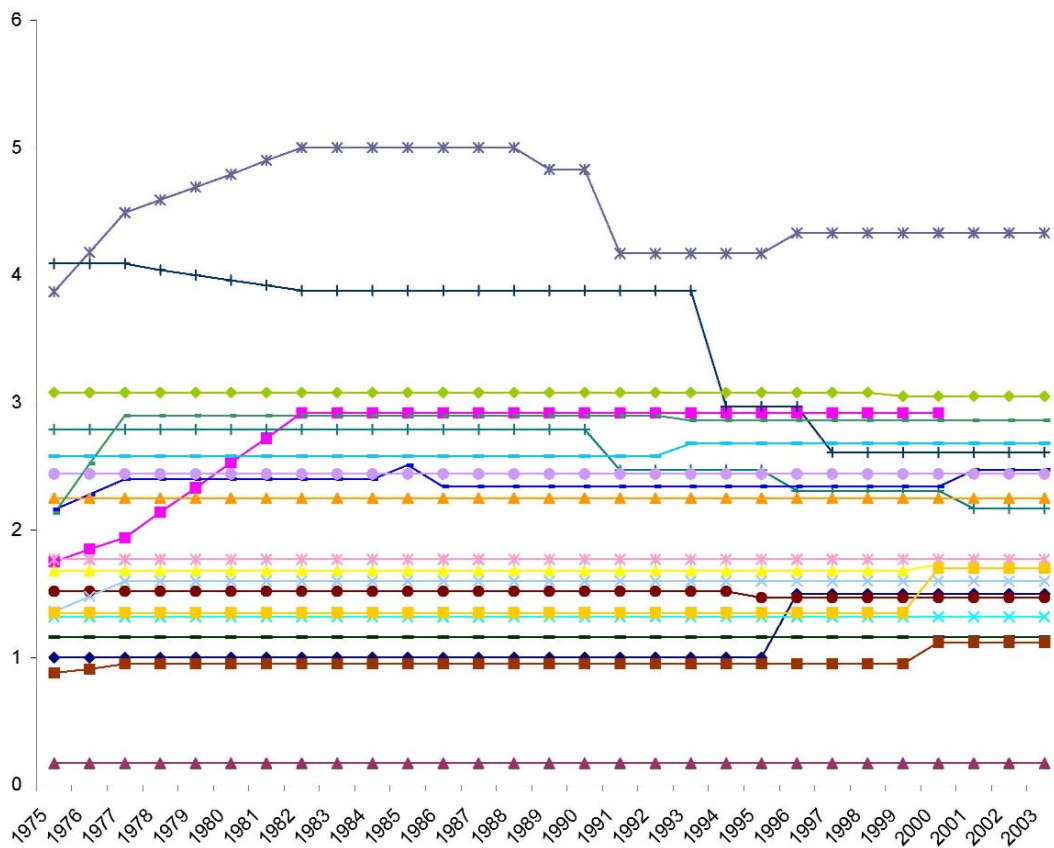Figure 1 – Link between self employment, policy indices and tourism.

Figure 2 – EPL over time in the OECD. Figures 2-4 suppress country labels
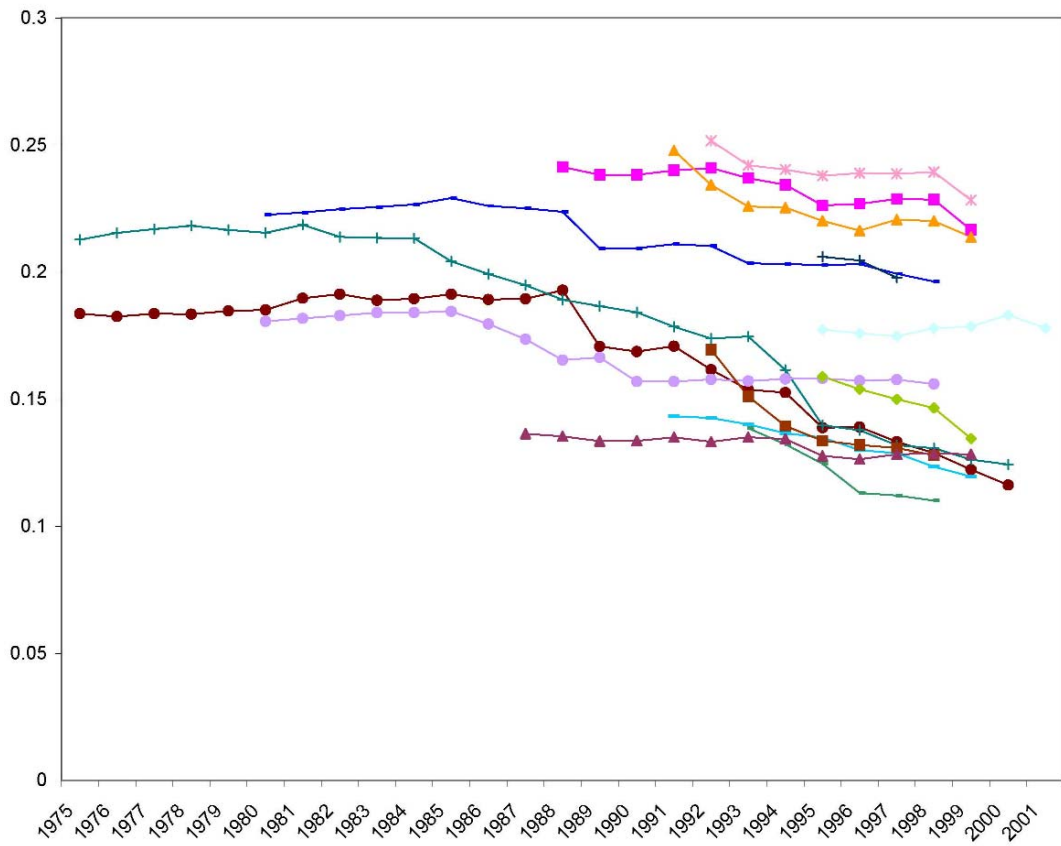for simplicity. Source – Faggio and Nickel (2006).

Figure 3 – PMP over time in the OECD. Source – Conway and Nicoletti (2006), STAN and authors' calculations. Conway and Nicoletti (2006) data are based on the OECD Indicators of Regulation Impact. These indicators measure the potential costs of anti-competitive regulation at the industry level. We obtain country-level measures by weighting the industry values using their share of value added.
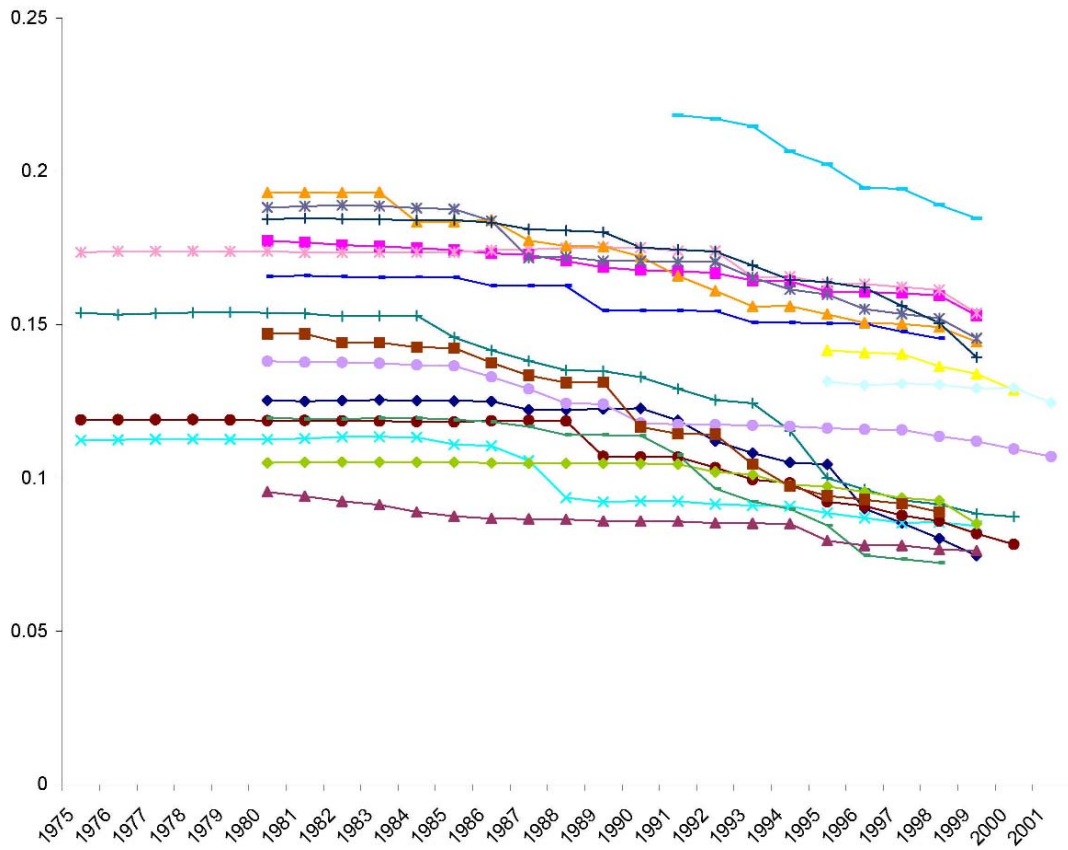
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Figure 4 – PMP over time in the OECD: manufacturing. Source – Conway and Nicoletti (2006), Eurostat and authors' calculations.
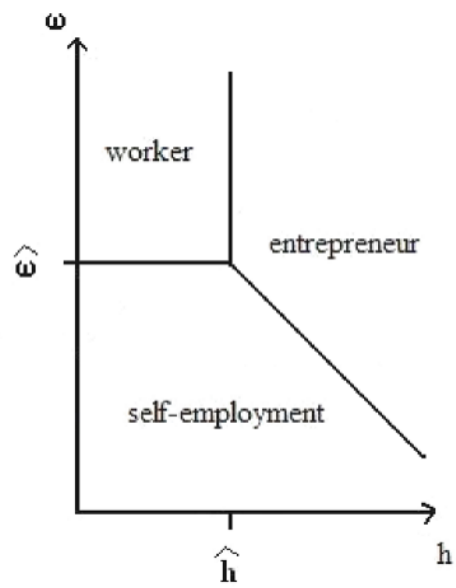
Figure 5 – Relationship between occupational choice and agent types.