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Abstract

This paper exploits the available empirical evidence in order to shed light on the take-off of temporary employment in Italy. This kind of non-standard employment was recently legalized by the law 196/1997. The national data set of "Manpower" -one of the leading agencies in the Italian market- is used to address two related questions. One, what is the utilization intensity of temporary employment in each sector of the economy? And two, is it related to volatility or recent changes in the hiring pattern? To sidestep the fact that official statistics report all temps in the service sector, this paper combines the "Manpower" data set with other sources and estimate the share of temps within each industry. The utilization of temps appears to be positively correlated with production volatility. Recently, industries that have used temps more intensively experienced a drop in their share of total permanent employment. These findings support the view that the take-off of temporary employment in Italy was essentially demand driven.

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1 Introduction

The growth of non-standard employment (part-time, temporary employment, self-employment, fixed-term contracts, etc.) is one of the major stylized facts of Western labor markets during the last decade.[1] Although different from each other, these types of work have the common feature of diverging from the pattern of what was considered as standard employment, i.e. a job relationship embedded in a full-time, open-ended and secure contract. The Italian labor market reached this common pattern toward non-standard employment only in recent years. In particular, the liberalization of temporary employment (TE henceforth)[2] represented the most effective intervention in this area. A promising take-off of TE has started, subsequent to the so-called "Treu law" (law 196/1997) which legalized and regulated the supply of temporary workers by authorized agencies.

Following TE liberalization, a "hot" policy debate over the effects of this intervention for firms and workers has begun. The welfare evaluation of TE is controversial. Supporters emphasize the virtues of flexibility in labor organization, as well as the fact that temporary jobs give an alternative to people not interested in standard employment and serve as a springboard for those looking for a permanent job. Opponents argue that temporary workers are precarious and have no claim either to job security or to benefits tied to length of service. In the sclerotic Italian labor market, where employment protection legislation is usually blamed for the plague of long-term unemployment, it is crucial to understand whether TE is returning (or breaking in) to permanent employment or whether it is simply used for a firm's flexibility reasons. This paper will not however directly deal with this issue during the discussion of the empirical results.

Two related empirical questions will be addressed. What is the utilization intensity of temporary work in each sector of the economy? Is it related to volatility or recent changes in the hiring pattern? To answer these questions, the national data set of "Manpower" -one of the leading companies in Italy-

[1] On this general trend, see Felstead and Jewson (1999).

[2] In the following, the expressions "temporary employment" and "temporary work" will refer to a triangular contract, in which an agency hires a worker for the purpose of placing him/her at the disposal of a client firm for a temporary assignment. The distinction between temporary work, in this sense, and fixed-term contracts is clear in Italian ("lavoro interinale " vs. "lavoro a tempo determinato"), but less in English-speaking countries where temporary work is sometimes referred to as "agency work" or "dispatched work".

will be used. Section 2 discusses the rationale of both firms and workers for signing a temporary contract, reviewing employer and employee surveys in Europe and the US. Section 3 briefly describes the regulatory content of the Italian liberalization of TE. Section 4 presents data description, the estimation procedure used to retrieve TE utilization by industry, and the empirical results. Since official statistics report all temporary workers in the service sector, the "Manpower" data set is combined with other sources, in order to estimate the share of temps within each sector of the economy. Section 5 concludes the preliminary findings of the paper.

2 Employer's and Worker's Motivations

When asked why they make use of temporary workers, firms usually give two types of answer: 1) organizational or business-cycle flexibility; 2) personnel screening and selection. Bronstein (1991), reviewing employer surveys for Western Europe, indicated three main motives: temporary replacements; fulfilment of occasional jobs or during peak activity; prospect for temporary workers to fill vacancies on a permanent basis. Atkinson *et al.* (1996) reported, in a United Kingdom survey, the following reasons firms hire temps:[3] covering maternity leave (37.8%); covering holiday/sick leave (59.4%); matching peaks in demand (63.3%); performing one-off tasks (39%); trial for permanent work (20.2%). According to a survey conducted by Abraham (1988), among US firms using temporary employees, 79% declared at least one motivation that might be labeled "variability in demand", 88% declared at least one motivation related to fluctuations in the labor supply of regular employees, and 16% quoted the screening rationale. Houseman (2000) presents an employer survey for the US where the most frequently cited reasons are: to provide assistance at times of unexpected increases in business (52%); to fill a vacancy until a regular employee is hired (47%); to cover holiday/sick leave (47%); to screen candidates for regular jobs (21%). The same survey reports that 43% of firms using temps decided "often" or "sometimes" to move them into permanent positions, even though they had not hired them for screening purposes. The only available survey for Italy (Confinterim, 2000) reports three reasons: peak activity (70%); replacements (18%); expertise not available within the firm (12%). The absence of the se-

[3] The percentages reported in this survey, and those following it, do not sum to 100% in some cases since firms were allowed to give multiple answers.

lection rationale depends on the questionnaire and the fact that collective agreements do not provide for screening as an official justification to hire temporary employees.

On the other side of the employment relationship, workers may decide to take a temporary job for three sets of reasons: 1) individual flexibility; 2) lack of alternatives; 3) signaling (i.e. to signal that their ability is high by making themselves available to be screened during temporary assignments). The first category concerns both those who like temporary work as a way-of-life choice (especially women) and those who do temporary work to clear up their job preferences (especially the young). The second and third motivations conflict each other. The choice of TE could represent either a "bad signal" (if it were due to a lack of alternatives) or a "good signal" (if it came from the worker's availability to be screened). It is not easy to disentangle empirically these reasons while looking at surveys based on samples of temporary workers. For instance, Bronstein (1991) indicated two main answers given by workers: personal choice; looking for a permanent job (which includes categories 2 and 3). Atkinson *et al.* (1996) reported two reasons: could not find permanent job; did not want permanent job (which includes 1 and 3).

On the whole, flexibility -both related to fluctuations in market demand and regular labor supply- seems the main reason why firms use TE, while the screening rationale is relevant too. The relative weights of these different motivations critically depend on the institutional setting. The higher firing costs for open-ended contracts, the larger the scope for TE as a screening device, since firms attribute greater importance to the quality of the long-term match. In the same time, higher firing costs might induce firms to substitute temps for regular employees, reducing the number of transitions from temporary to permanent work. The demand for flexibility might become the driving force behind the utilization of temporary employees, especially in sectors of the economy that must face an erratic market demand or deal with an increase in domestic and international competition. As a consequence, the overall effect of employment protection legislation on the utilization of temporary work is ambiguous.

The more widespread other instruments of screening (fixed-term contracts, in-job training, probation, etc.), the less useful TE as a selection device. Even if other instruments were available for firms, TE could be preferred because it is less associated with a damaging "hire and fire" reputation. Moreover, it should be noticed that flexibility and screening are not necessarily *substitute* motivations, since in many cases they may *complement*

each other. For example, a firm might hire a temp to face a non-permanent increase in market demand, and decide later to use the same worker (already screened during the short-term assignment) to fill a permanent vacancy.

The Italian labor market -because of the rigidity of standard employment regulation and the recent liberalization of TE- seems an environment where both the demand for screening and the demand for flexibility by firms might be important. The next section elaborates on this consideration through a brief description of TE liberalization in the context of the Italian labor regulation. Section 4 collects some preliminary evidence, with the aim to understand *by whom* temporary agency workers in Italy are used and *why*.

3 The Liberalization of TE in Italy

The evolution of the Italian labor regulation (including law, collective bargaining and judicial application) has produced relevant hiring and firing costs. However, the regulatory rigidities have often been sidestepped by means of *atypical* (CIG, industrial rescues, etc.) or *informal* (shadow economy) types of flexibility.[4] Despite these remarks, the Italian labor market is considered one of those with the strictest employment protection legislation, as far as regular employment is concerned. If we look at the OECD indicators that try to capture the extent of firing costs, we see that among the 27 OECD countries, Italy ranks 23^{rd} in terms of the "overall strictness of protection against dismissals".[5] The same OECD report points out that: "Between the late 1980s and the late 1990s, there was considerable continuity in employment protection legislation practices in most countries. The major exception to this picture of continuity is that a number of countries liberalized significantly the regulation of employers' use of fixed-term contracts and the operation of temporary work agencies".

Italy is a good example of such a trend. Besides the traditional atypical and informal types of flexibility, new ones have emerged in the area of non-standard employment. In 1987, collective agreements were allowed to extend the use of fixed-term contracts specifying target groups, motivations and employment shares (see law 56/1987). The utilization and renewal of fixed-term contracts, however, is still strictly regulated. This kind of contract can be extended only once and for a period shorter than the initial employment;

[4] On the Italian labor regulation, see Sestito (1996), Boeri (1996) and Ichino(1996).

[5] See OECD (1999). Lower ranking indicates stricter regulation.

the contract becomes permanent if the work continues over the terminal date or the contract is extended more than once. During the 1990s, the conditions regulating in-job training contracts for workers aged between 16 and 32 have been repeatedly changed (see law 451/1994, art.16; law 608/1996, art.9; law 196/1997, art.15-16).

Moreover, temporary work agencies were legalized in 1997 (law 196/1997, art.1-11).[6] The "Treu law", implemented in 1998, has generated a promising take-off of TE. In 1999, Italian temporary workers were about 250,000. In 2000, they are estimated to be about 470,000 (Confinterim, 2000). This new kind of employment relationship has quickly expanded, especially in the North of the country and in manufacturing sectors. The fact that OECD (1999) ranks Italy 20^{th} in terms of "strictness of temporary work regulation" seems not to take into account the reform application (collective bargaining) and the changes made by the year-2000 budget law.

The "Treu law" states that temporary work is forbidden in the following cases: lowest positions of the job ladder; replacement of workers on strike; firms that made collective dismissals in the last 12 months; jobs that require medical vigilance; firms that are experiencing a time-of-work reduction. The year-2000 budget law has ruled out the prohibition of temporary work for the lowest positions of the job ladder. The "Treu law" does not set a maximum cumulated duration of temporary contracts or legal motivations for using temporary work, leaving the provision of further regulation to collective bargaining. Collective agreements stipulate that temporary workers cannot exceed 8-15% of normal employees (depending on the sector) and fix the allowed motivations for using them: peak activity; one-off work; expertise not available within the firm. According to the collective agreement for agency workers, firms cannot extend an individual contract more than four times and for a cumulated period longer than 24 months. In other words, firing costs for standard employment remain high in the Italian labor market, and TE faces less regulatory restrictions than other short-term contracts. In this context, firms might decide to hire temps in situations that generate different kinds of employment relationships in other countries.

[6] On the new pattern followed by temporary work regulation in Europe, see Schomann and Schomann (2000). On the Italian regulation, see Ichino (2000).

4 Who Uses Temps?

4.1 Data and Descriptive Statistics

This section makes use of the national data set of "Manpower", an international firm operating in the sector of temporary work and one of the main companies in the recently created Italian market. The data set contains the individual characteristics of all temporary workers employed by "Manpower" agencies. Unfortunately, the data set lacks important information, e.g. years of schooling or transition to permanent employment. The current data set reports the following personal details of each worker: gender; age; place of residence; married or single status; nationality; occupation profile (blue-collar or white-collar). The data set also contains the number and time-duration of temporary assignments, as well as the economic sector and geographic location of the client firms that used the worker.

The data set considers all the workers sent to temporary assignments ("missions" in the terminology of agencies). The starting dates of recorded missions range from February 1998 to October 2000; the number of temporary workers who did at least one mission is 57,268; the number of using firms is 11,779; the total number of signed temporary contracts is 100,029. The workers in the data set can be seen as a random sample drawn from the population of all Italian temps. In fact, the market share of "Manpower" in Italy is around 25% and its agencies are distributed across all regions. Moreover, the Italian market for temps is not specialized and agencies cover all types of jobs.[7] These elements are worth noting, since in the following sections the assumption that the "Manpower" data set is a random draw from the population of temporary employees in Italy will be extensively used.

Table 1 reports in the second column descriptive statistics of the individual characteristics of the temporary workers employed by "Manpower". All variables but age are dummy. The third column offers some comparisons with permanent employees in the private sector.[8] The representative temp is young (the average age is 28.6), single (82%); male (66%) and blue-collar (75%). The vast majority of temporary workers is Italian, although 8% of them have different nationality.

[7] The assumption is further confirmed by the fact that Confinterim (2000), the association of all TE companies except "Manpower", reports similar descriptive statistics of temporary workers' characteristics in its annual report.

[8] See Ministero del Lavoro e della Previdenza Sociale (2000).

Table 1. Characteristics of temporary workers

	Temporary Workers	Permanent Employees
Male	0.66	0.63
Age	28.6	39.6
Single	0.82	-
Blue	0.75	-
Italy	0.92	-
Second contract	0.34	-
Third contract	0.14	-
North	0.61	0.52
Center	0.27	0.20
South	0.12	0.28
Manufacturing	0.75	0.41
Services	0.23	0.46
Other sectors	0.02	0.13

Nearly one third of workers (34%) received more than one temporary assignment, and 14% more than two. If we classify workers according to the broad sector of the economy or the geographic location where they were employed, we see that TE is prevalently used by firms in the North of the country (61%) and in manufacturing sectors (75%). The figures for firms instead of workers (not reported in Table 1) are slightly different: 71% in manufacturing sectors and 68% from the North. This means that manufacturing firms are not only the lion's share of those using temporary workers, but they also use this form of employment more frequently than other firms. Firms from the South use TE intensively (12% of total workers), even though they are a very small fraction of total firms using TE (3.7%). The bias toward manufacturing sectors is worth noting from the perspective of international comparison. For instance, in the US -where TE has been used for decades- manufacturing sectors employ only 29.8% of temps, while in Spain -where TE was legalized only recently- they employ 34.9%.[9]

[9] For international comparisons, see Ciett (2000). On the comparison between Italy and Spain, see Cebrian *et al.* (2000).

4.2 TE Utilization by Industry

Like every National Statistical Institute, the Italian ISTAT classifies employees by the industry of the employing firm rather than by the industry where they are actually working. As a result, all temps are included in the service sector which contains temporary work agencies (specifically in sector "K" according to the ATECO classification). This happens because temporary workers are officially employed by the agency which sends them to a mission, not by the firm which uses them for a short-term assignment. There is scant evidence concerning the industry of assignment of temporary workers. This section aims at filling the gap by combining the "Manpower" data set with other sources of information. The estimation procedure follows an idea suggested by Estevao and Lach (1999) who perform a similar estimation for the US, even though they use alternative types of data, rely on different assumptions and use their estimates for a different application. The availability of the "Manpower" data set -as long as it can be considered as a representative sample of the Italian temp population- allows us to estimate the utilization of temporary workers by economic sector without any restrictive assumption.

Let $tw_{it} = 1$ denote the event that individual i is a temporary worker in period t. The sectorial parameter to be estimated is the probability that an individual working in sector j at time t is temporary, which can be indicated as θ_{ijt}. As noted, we cannot retrieve this information from official statistics. Using the "Manpower" data set, it is possible to estimate the probability that a temporary worker is employed in sector j at time t, denoted by α_{ijt}. Formally:

$$\theta_{ijt} = \Pr\left[tw_{it} = 1 \mid s_{it} = j\right]$$

$$\alpha_{ijt} = \Pr\left[s_{it} = j \mid tw_{it} = 1\right]$$

where the expression $s_{it} = j$ denotes that individual i works in sector j at time t. According to Bayes' rule, we can write θ_{ijt} as a function of α_{ijt}:

$$\theta_{ijt} = \alpha_{ijt} \frac{\Pr\left[tw_{it} = 1\right]}{\Pr\left[s_{it} = j\right]}$$

This simple transformation suggests a way to estimate the sectorial parameters within which we are interested. In order to estimate the probability of being temporary while working in a specific sector j (i.e. to assess the relative use of temporary workers in each sector), we need the following ingredients:

$$\widehat{\theta}_{ijt} = \frac{\widehat{\alpha}_{ijt} T_t}{N_{jt} + \widehat{\alpha}_{ijt} T_t}$$

where T_t is the total number of temporary workers at time t, N_{jt} the number of permanent workers employed in sector j at time t, and $\widehat{\alpha}_{ijt}$ the estimated probability of working in sector j at time t conditioning on being a temporary worker. Where can these ingredients be retrieved from?

The probability $\widehat{\alpha}_{ijt}$ can be estimated as the proportion of temporary workers employed in sector j at time t according to the "Manpower" data set. The figures of N_{jt} are reported by ISTAT on a quarterly basis (see "Conti Trimestrali").[10] The number T_t has to be estimated and deserves particular attention. Statistics on permanent employees usually report *stock* measures (i.e. the number of employees in a particular moment or the average of different revelations). We do not have *flow* measures (i.e. the total number of people who have been employed for at least one day during a specific period). In the case of permanent employment, the difference between the two types of measure is not very relevant. On the contrary, in a situation of high turnover, like the one of temporary work, the difference is usually big. If one is interested in assessing the effect of temporary work on the labor force, the flow measure allows a better understanding of how many people are involved. If one is interested in assessing the impact of temporary work on the economy and employment, the stock measure provides a more meaningful indicator. In order to estimate the sectorial intensity of TE utilization, it is better to use stock measures. The N_{jt} given by ISTAT are stocks, but there are not similar figures of T_t. Confinterim (2000) provides a flow measure of the total number of temps in 1998, 1999 and 2000. Hence, the "Manpower" data set can be used to retrieve quarterly stock figures of temporary workers from the Confinterim annual flow numbers. Along all these steps, the only required assumption is that the "Manpower" data set is a representative sample of the entire population of Italian temporary employees. In order to make different data sources comparable with each other, we have to use a classification of the economy in 14 sectors and a quarterly time span.

[10] Notice that, when estimating θ_{ijt} for the service sector "K", we need to adjust N_{jt} in order not to count twice temporary workers employed by other sectors.

Table 2. TE utilization by sector (%)

Sector	$\widehat{\theta}_{i,2000.2}$
Agriculture	0.01
Construction	0.08
Energy	0.15
Food/Beverage/Tobacco	1.04
Textiles/Etc.	0.33
Wood/Paper/Etc.	0.36
Chemicals	3.90
Non-Metal Minerals	0.21
Metals	0.18
Machinery/Electronics	4.73
Transportation Manufacturing	3.23
Retail/Wholesale/Tourism	0.15
Transportation/Telecomm.	0.82
Banking/Insurance/Etc.	0.24
Whole Economy	0.81

The sectors may be grouped in broader categories: eight in "manufacturing" ("food/etc."; "textiles/etc."; "wood/etc."; "chemicals"; "non-metal minerals"; "metals"; "machinery/electronics"; "transportation manufacturing"); three in "services" ("retail/wholesale/tourism"; "banking/etc."; "transport/communications"); three in "other" ("agriculture"; "construction"; "energy"). For the moment, it is possible to estimate the θ_{ijt} for these sectors in nine quarters (from 1998.2 to 2000.2). Public employees are not considered, since TE was extended to the public sector only in 2000. Table 2 reports the results (in percentage terms) for the last available quarter (2000.2). The evolution of the $\widehat{\alpha}_{ijt}$ and $\widehat{\theta}_{ijt}$ across the quarters is shown in the appendix.

In the second quarter of 2000, the intensity of TE utilization in the whole economy (again, excluding the public sector) was equal to 0.81%. This number is below the level observed in countries where TE developed earlier. The overall incidence is 4.5% in the Netherlands, 3.2% in the United Kingdom, and 2.5% in France.[11] In the US, we observe 2.5% in the whole economy and 3.5% both in manufacturing and services. The extent of TE in Italy appears very small, but additional remarks should be taken into account. The take-off of TE has only started: Confinterim (2000) predicts that the

[11] See Ciett (2000). The average TE utilization in the European Union is 1.5%.

number of temporary workers will duplicate by the end of 2000; according to Ciett (2000), Italy will outmatch the 2% level by 2010. The stock measure captures the incidence of this type of work on the economy, but not its diffusion among workers: if turnover were high, TE would still represent the springboard toward regular employment for a relevant part of the labor force. Moreover, the intensity of TE utilization varies widely by sector.

As shown in Table 2, in three sectors of the economy, the utilization of TE has already reached US-type levels: machinery/electronics (4.7%); chemicals (3.9%); transportation manufacturing (3.2%). From a perspective of "demand for flexibility", it is not surprising that these manufacturing sectors have been the first ones to exploit the potentiality of TE. Transportation manufacturing represents a good example. As pointed out by Ciett (2000), the European automotive industry has undergone tremendous changes over the last few decades, such as the shift from a product-driven to a demand-driven production schedule and the increase in international competition. Firms operating in this sector must deal with ever-shorter demand cycles and unforeseeable production peaks. All these trends have fostered the demand for flexibility. This preliminary overview confirms the conclusion by Isfol (2001), according to how the introduction of temporary agency work in Italy helped firms to recover "production flexibility" with respect to low-skilled and blue-collar segments of the labor force.

At first glance, it seems puzzling that non-manufacturing sectors characterized by seasonal activity peaks -such as agriculture and tourism- show a negligible utilization of TE. This could be explained by the fact that these sectors are already using atypical or informal employment to deal with their flexibility needs (family work, cooperative work, shadow workers like immigrants in the South or students elsewhere, etc.). In the future, it will be interesting to see whether temporary help agencies will be able to design win-win solutions, making it profitable for both firms and workers to shift from these atypical or informal relationships to temporary work.

4.3 TE Utilization, Volatility and Hiring Pattern

The small number of sectors considered by the previous estimation makes it possible to examine case by case the reason why TE is used. It is also possible, however, to detect empirical correlations in the available data with the aim to shed light on the sectorial variability of TE utilization. The 14 economic sectors can be clustered according to their utilization of temporary

work. All the sectors in the interval $[\theta - \sigma/2; \theta + \sigma/2]$ could be included in a "medium" group, where θ is the average intensity and σ the standard deviation. All the sectors below this interval could be included in a "low" group and all those above the interval in a "high" one. This procedure (of course, with a little bit of arbitrariness as in every clustering) produces three groups containing the following sectors: three in the high-intensity group (machinery, chemicals, transportation manufacturing); four in the medium-intensity group (food, textiles, wood/paper, communications); seven in the low-intensity group (agriculture, construction, energy, non-metal minerals, metals, trade/tourism, banking/insurance). Visual inspection confirms the plausibility of this clustering, particularly for the distance between the high group and the other two. This procedure allows us to compare the means of some interesting indicators in the three groups. Specifically, it is interesting to look at the correlation between TE utilization and production volatility or changes in the sectorial share of permanent employment. The first step observes the role that activity peaks play in the demand for temporary workers. The second step observes the change in the hiring patterns of permanent workers, subsequent to the liberalization of TE agencies.

The results are summarized in Table 3, which contains the group means of the first-column variables. The variable $\widehat{\theta}_i$ is the estimated sectorial utilization intensity of temporary workers; IP is the variance of the monthly index of industrial production in the period from 1998.2 to 2000.2; POS is a measure of positive variability in the same period, i.e. the variability of IP above its trend level; VOL is a dummy equal to one if the sector shows a volatility above the average.

Table 3. Volatility and permanent hiring by TE intensity

Variable	*"High" group*	*"Medium" group*	*"Low" group*	*Sectors*
$\widehat{\theta}_i$	3.95%	0.64%	0.15%	14
IP	555	371	309	9
POS	223	174	167	9
VOL	1	0.25	0.17	13
$\Delta\gamma_{i,after}$	-2.4%	-3.6%	+1.8%	14
$\Delta\gamma_{i,before}$	+1.6%	-0.7%	-0.1%	14

The index IP averages 412 and displays a standard deviation equal to 190; the index POS averages 188 and displays a standard deviation equal to 55. Not all indexes are available for all sectors, but each of them is available for at least three sectors in every intensity group.[12] As shown in Table 3, all the average volatility indexes are greater in the high-intensity group than in the others, and those in the medium-intensity group are slightly greater than those in the low-intensity one. The means of the high-intensity group are significantly different at a 5% level from those of the other groups, according to t-tests on the equality of means. The differences between the means of the medium and those of the low-intensity group are not always statistically significant. There is enough evidence, however, that a substantial correlation between production volatility and TE utilization is present.

The last two rows in Table 3 report the change in the group share of permanent employment *before* and *after* the liberalization of TE. Using the previous notation, the probability of working in sector j at time t conditional on being a permanent worker is defined as:

$$\gamma_{ijt} = \Pr\left[s_{it} = j \mid tw_{it} = 0\right]$$

The variable $\Delta\gamma_{i,after}$ is the percentage change of the estimated γ_{ijt} by intensity groups, during the period from 1998.2 to 2000.2; the variable $\Delta\gamma_{i,before}$ is the same percentage change during the period from 1996.1 to 1998.1. The second quarter of 1998 coincides with the period when the first TE agencies received the ministerial authorization to operate and started recruiting temporary workers. Table 3 shows that the high-intensity group reduced its share of permanent employment after the introduction of TE. The same thing happened to the medium-intensity group, even though by a lower amount. A similar trend was not at work before. The change in the hiring pattern is particularly evident in the three high-intensity sectors, even though the real amount is quite small. This does not mean that a causal effect is present, since counterfactual evidence is not available and a lot of possible explanations of the detected correlation exist. However, we can at least rule out the possibility that TE has been used more intensively in some sectors simply because they experienced an overall increase of their employment share.

The correlations summarized in Table 3 seem to indicate that the take-off of TE in the Italian labor market was essentially demand driven, and the

[12] Notice that IP and POS are available for nine sectors, while VOL is calculated for all sectors but agriculture (mixing the variance of the monthly index of industrial production for manufacturing and the variance of the monthly index of sales for services).

flexibility needs of firms were the driving force behind the initial growth of this non-standard employment. This does not imply any welfare evaluation of TE. The possibility of using TE might allow firms to create job opportunities that they would not offer if TE were not available. Moreover, permanent employment (assuming that this is the preferred arrangement for the great majority of the labor force) might still be a by-product of flexibility for a lot of workers, who might end up in a permanent job after a period of temporary assignments. In the Italian labor market, where long-term unemployment is one of the major cause of concern, this effect might be first-order. In fact, TE might have a positive effect on the probability of finding a permanent job through two different channels: 1) the acquisition of human capital, social contacts and/or information about permanent vacancies; 2) signaling, i.e. the possibility for workers to signal their own individual ability by making themselves available to be screened during temporary assignments. Ichino, Mealli and Nannicini (2003) implemented an econometric evaluation project, aimed at estimating the causal effect of the treatment "temporary work" on the outcome "permanent employment", by using a carefully designed data collection strategy and *Propensity Score Matching* estimation techniques.

As a final remark, notice that the estimated TE intensity by sector could be used -following the application of Estevao and Lach (1999) for the US- to disaggregate the overall growth of the utilization of temporary work in a "compositional" component and a "within" component. The former indicates that the expansion of this form of employment is a consequence of the more temporary-work-intensive industries having increased their sizes. The latter indicates that the expansion is due to changes in the hiring pattern within specific industries. If we calculate these components to explain the take-off of temporary work in Italy during the last two years, not surprisingly, we discover that 99% of the growth of temporary work is due to the within component. It will be interesting to replicate these calculations in the years to come when the temporary work market reaches its maturity in Italy.

5 Conclusion

This paper exploits the available empirical evidence to address a set of related questions regarding the take-off of temporary work in Italy, where this kind of non-standard employment was liberalized in 1997. The national data set by "Manpower" is combined with other statistical sources, in order to estimate

the intensity of TE utilization by sector of the economy. TE utilization was equal to 0.81% in the whole economy at the end of 2000, far below the level of other industrialized countries that liberalized TE before. However, the spreading of TE across Italian firms and regions has only started and consistent growth is expected in the future. Moreover, three manufacturing sectors have already reached US-type levels of utilization: machinery/electronics (4.7%); chemicals (3.9%); transportation manufacturing (3.2%). A positive and significant correlation between production volatility and TE utilization shows up from the empirical evidence. The sectors that have used TE more intensively experienced an after-liberalization drop of their share of permanent employment. These preliminary findings support the view that the take-off of temporary work in Italy was essentially demand driven, i.e. that flexibility needs by firms were the driving force behind the take-off.

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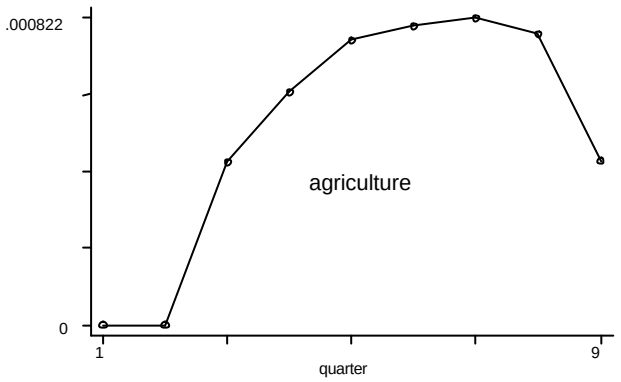
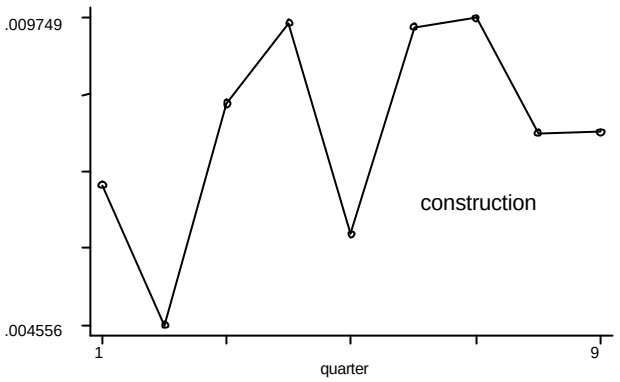
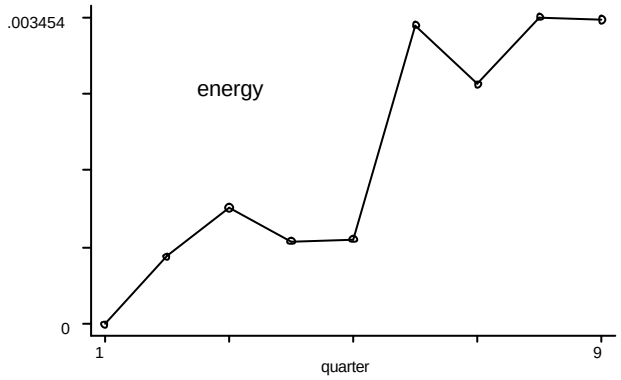
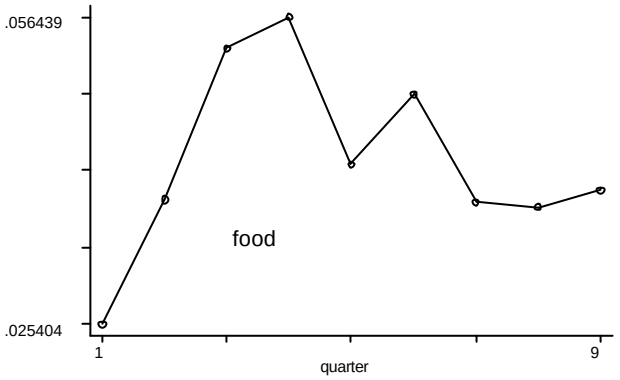
Appendix I

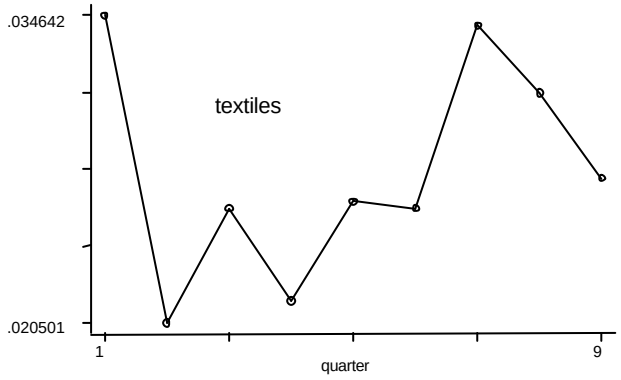
(A) The evolution of $alpha_{ijt}$ from 1998.2 to 2000.2

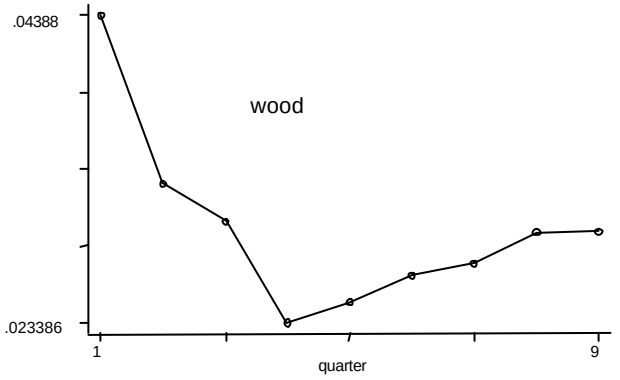


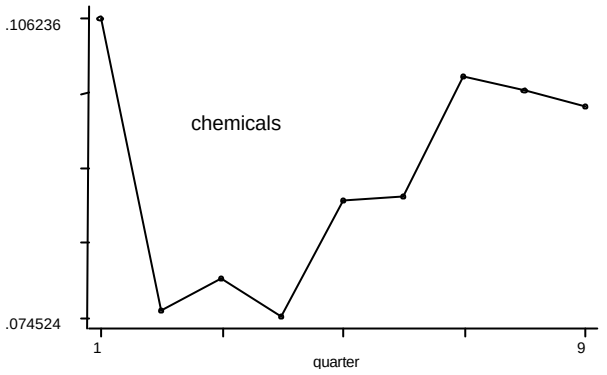








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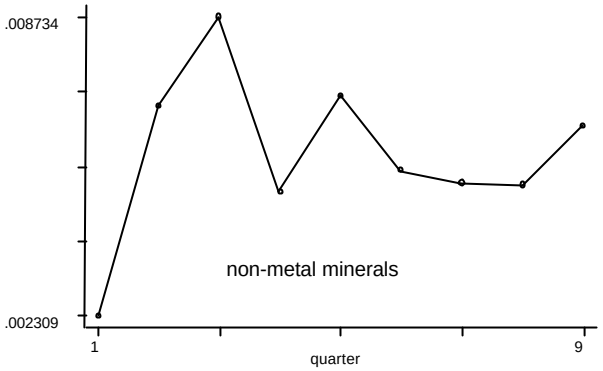
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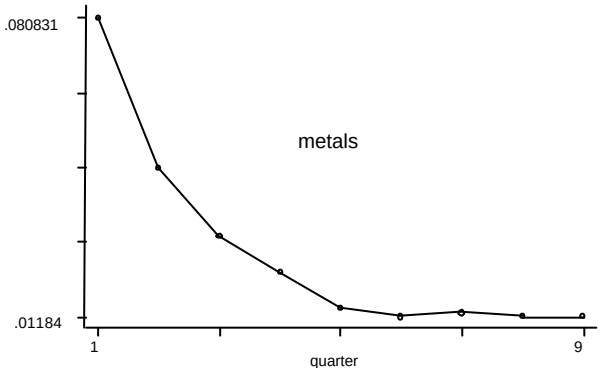
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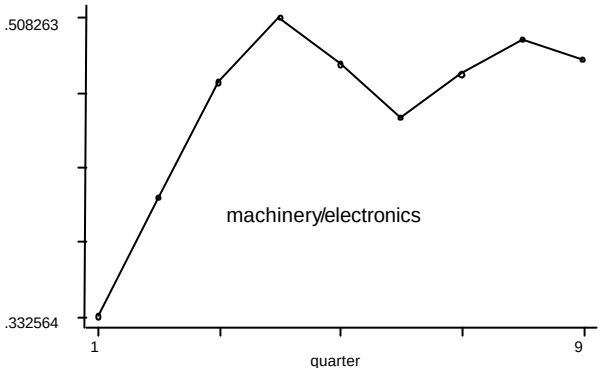
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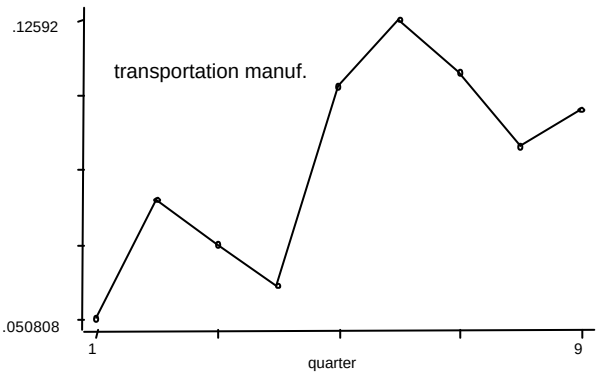
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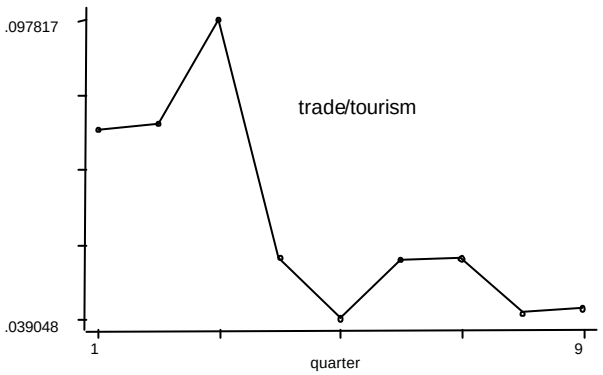
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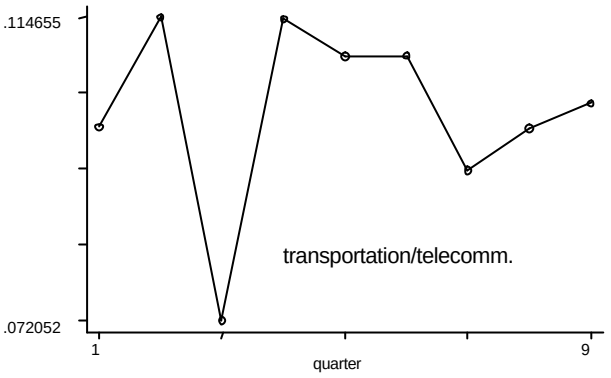

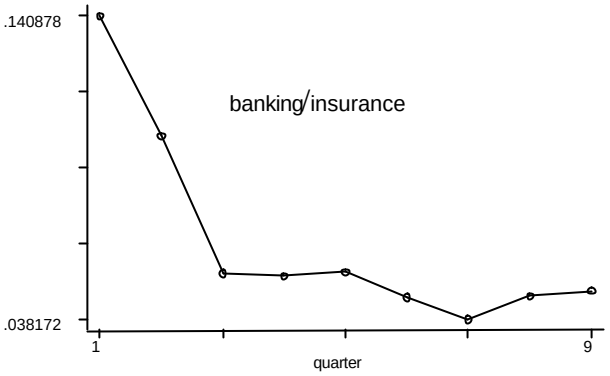

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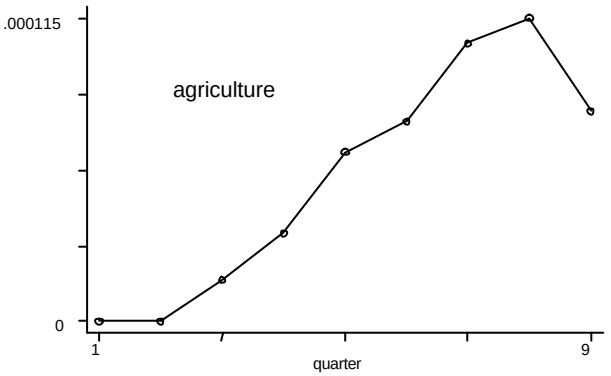

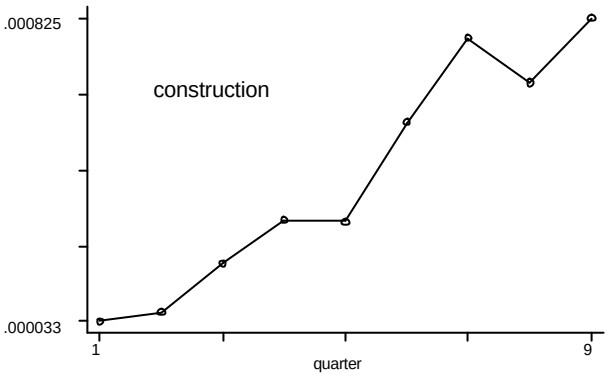

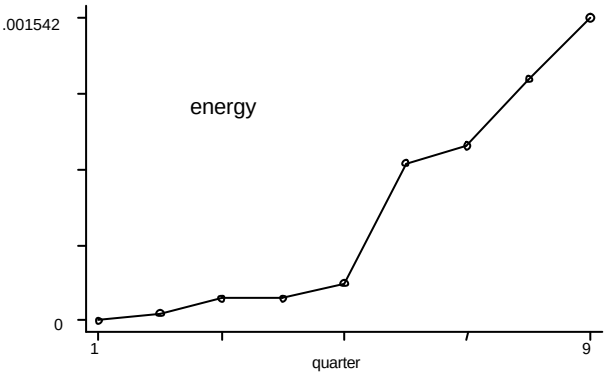

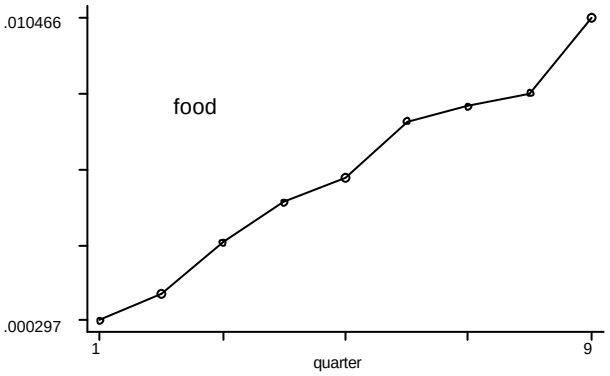

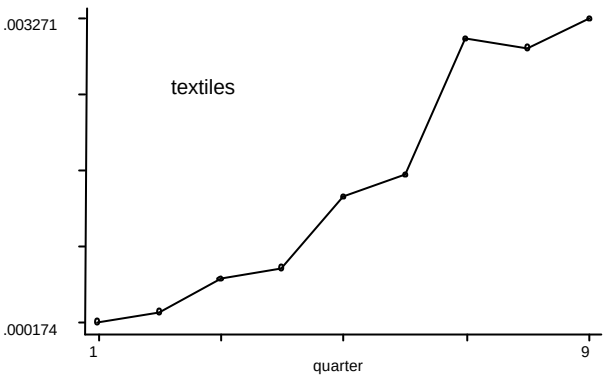
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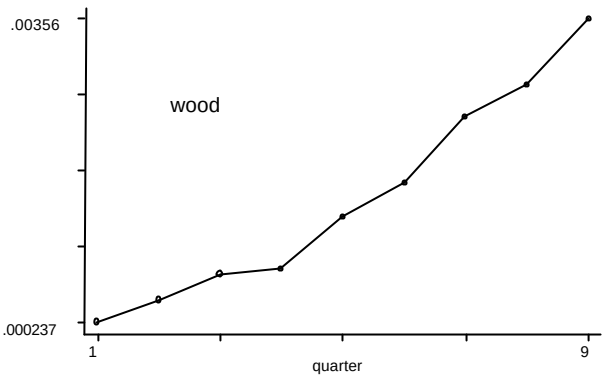
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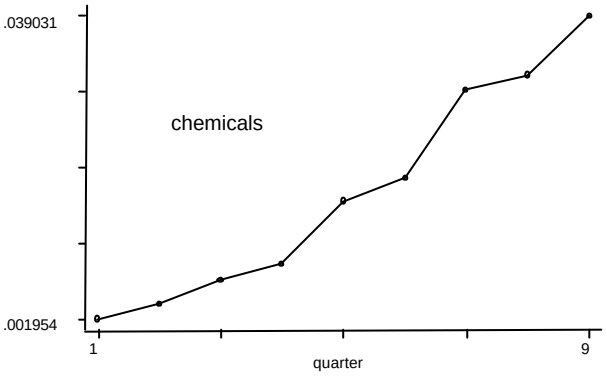
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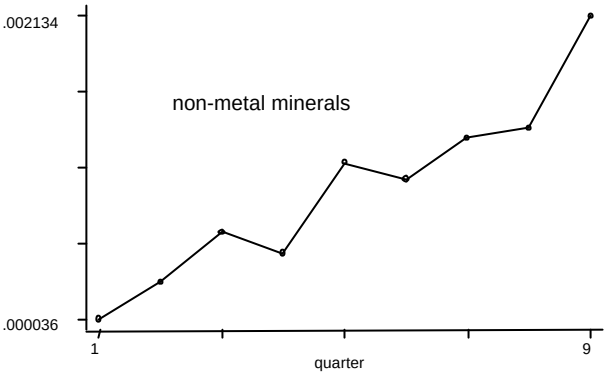
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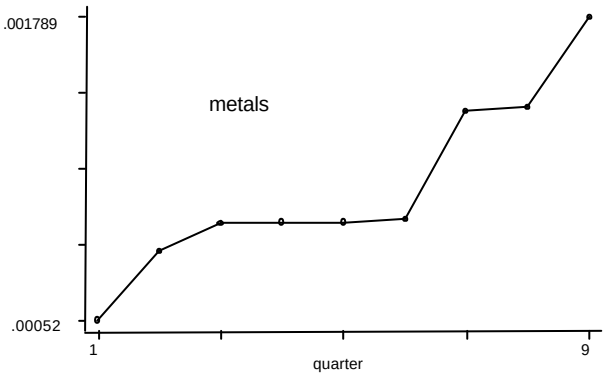
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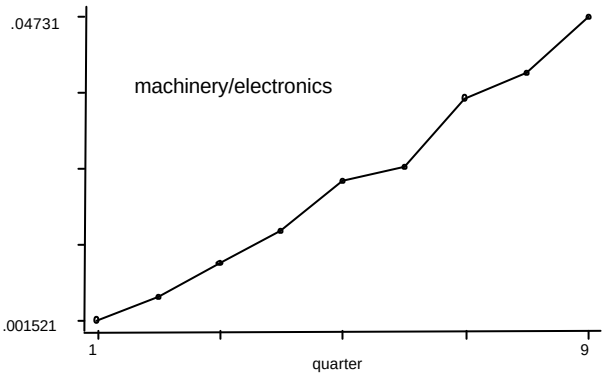
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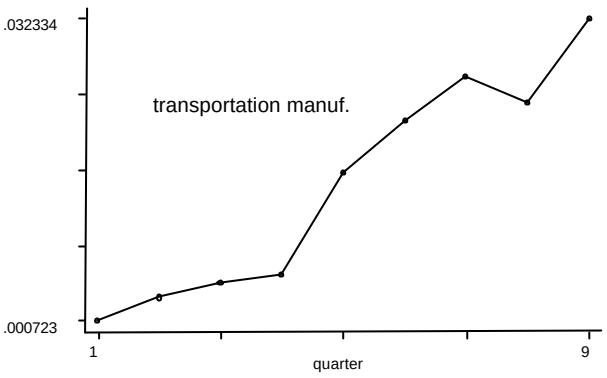
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trade/tourism
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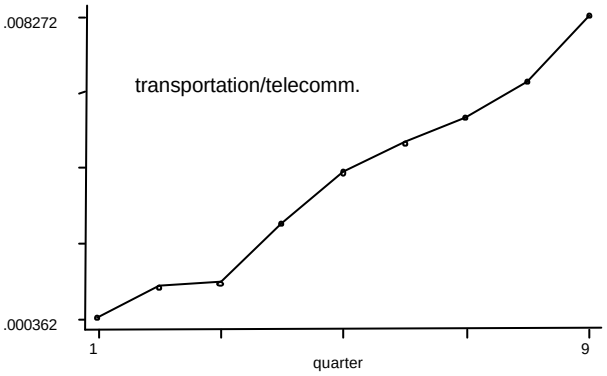
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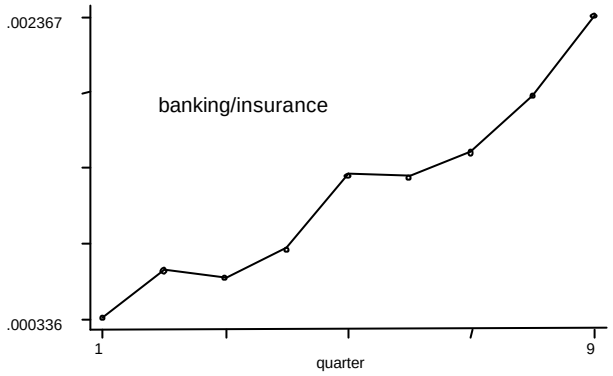
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