

Tax Law Changes, Income Shifting and Measured Wage Inequality: Evidence from India

Jagadeesh Sivadasan and Joel Slemrod *

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Abstract

Changes to the income tax law relating to wages and profits could provide incentives for shifting income from wages to profits (or vice versa), with important implications for measured wage inequality. We use a large dataset covering all registered plants in the manufacturing sector in India (over the period 1986 to 1995) to examine the effects of an income tax law change (effective from 1992) that eliminated the double taxation of wages paid to partners in partnership firms. We find an immediate and pervasive response by partnership firms to the tax law change, reflected in a significant shifting of income from profits to managerial wages. This shift has important implications for measured wage inequality, since about 50% of registered manufacturing plants are incorporated in the form of partnerships (including most family-run businesses). We find a significant jump in the mean and median relative wage of skilled workers (which includes managers and partners) following the tax law change in 1992. This sudden increase in measured wage inequality follows major trade liberalization and deregulation reforms announced in July 1991. We find that the income shifting induced by the tax law change explains almost all of the observed increase in measured wage inequality; this finding is robust to inclusion of controls for a number of other potential sources of post-liberalization increases in wage inequality. Once we control for income shifting, we find a much more moderate increase in wage inequality, in line with the pre-1991 trends. Our results show that income shifting responds strongly to tax incentives, highlighting the need to control for the potential effects of tax incentives in studies of wage inequality.

1 Introduction

In this paper, we investigate the effects of changes in Indian tax law regarding partnerships, on income shifting and measured inequality using a survey dataset covering the entire Indian manufacturing sector for the nine-year period from 1987 to 1995. The tax law change, introduced in 1992, increased incentives for partners to pay themselves wages and salaries, instead of taking income mainly as share of profits. Because the tax law change affected only partnership firms, we are able to use non-partnership firms as a control group, and identify the effects of the tax law using a difference-in-differences strategy.

To document this phenomenon, we examine the effect of the tax law on four measures would reflect the extent of income shifting: (i) the fraction of non-salaried owners; (ii) the profits-to-sales ratio; (iii) the wages-to-sales ratio; and (iv) the white collar wages to profits ratio. As a model of the incentives caused by the tax system suggests, we find that the fraction of non-salaried owners falls sharply, and the ratio of white collar wages to profits rises significantly in

*University of Michigan. email: jagadees@umich.edu, jslemrod@umich.edu

1992-93, the first year that the new tax laws took effect. There is also a drop in the profits-to-sales ratio, and an increase in wages-to-sales ratio following the tax law change. These are difference-in-difference effects on partnership firms that survive, controlling for shocks to specific industries and locations using state-industry year effects.

Note that the tax law change has an impact on measured inequality. The tax law change causes a shift in income for partners from profits to wages. Partner wages get added to the observed total white collar wage bill in the data, which leads to an increase in the measured skill premium (the ratio of the white collar wage rate to the blue collar wage rate¹) and in the ratio of the white collar wage bill to total wages.

Coincidentally, the tax law changes were introduced just a few months after a sweeping trade (and other market) liberalization announced in July 1991 and the effect of the tax law changes could impact an analysis of the effect of the trade liberalization. The effect of free-market policies and trade liberalization on inequality is a subject of an intense ongoing debate. A number of studies have documented an increase in wage inequality (usually measured as skill premium) in developing countries following expansion in trade. While observed increases in the skill premium are puzzling from the point of view of the simplest Heckscher-Ohlin model of trade, a number of alternative theoretical explanations have been proposed.² As discussed in the survey by Goldberg and Pavcnik (2004), potential causes for increasing wage inequality following trade liberalization include Stolper-Samuelson effects due to reduction in tariffs for unskilled-intensive industries, foreign direct investment (FDI) generating additional demand for skilled workers, skill-biased technological change, or quality upgrading by firms within industries.

Note that none of these trade-liberalization related explanations for increases in wage inequality suggest that the effect would depend on the form of organization of the firm. Thus, since the tax law changes were applicable only to partnership firms, we are able to adopt a difference-in-differences strategy to distinguish the effect of the tax law change from these alternative causes for increases in wage inequality.

Our examination of the trends over the 1987-1995 period reveals a sharp increase in the mean and in various percentiles of the distribution of the log skill-premium in 1993. We find similar effects on the share of white collar wages in the total wage bill. Examination of these trends across different forms of organization shows that the overall effects were largely driven by changes within partnership firms, suggesting that the tax-law change was responsible for the observed spikes in inequality. This is confirmed by our regression analysis where we control specifically for tariff changes, export and import orientation, FDI liberalization, distance to the frontier and capital intensity. We find that almost all (6.5% of the 7.3% mean increase in the log skill premium) is driven by changes to partnership firms.³ Similarly, we find that most of the increase (3.55% out of 4.63%) in the overall mean white collar share of the wage bill is driven by changes within partnership firms. Both of these findings are robust to the inclusion of various controls

¹The white-collar wage rate is obtained by dividing the total wage bill by the number of white-collar employees. The blue-collar wage rate is obtained similarly.

²See Robbins (1996), Slaughter (2000), Kremer and Maskin (2003), Goldberg and Pavcnik (2004) for surveys of this literature.

³A very small part of the change seems to be caused by changes specific to import-oriented sectors. Also, in the individual specification, there seems to be a relative decrease in skill premium in industries further away from the frontier (consistent with theory); however this effect is not present in the full specification.

and industry-location-size year effects.⁴ We conclude that the sudden increase in the log skill premium and the white collar share of the wage bill is driven primarily by income shifting by owners in partnership firms.

Our paper contributes to the literature on behavioral responses to tax distortions.⁵ It is, to our knowledge, the first such paper that documents these effects in a developing country context. We find a strong and immediate response to a change in tax laws that provided incentives to shift income from profits to wages. This finding is consistent with Slemrod’s (1990) classification of income shifting in the highest tier of a hierarchy of behavioral responses to tax policy changes. We find that adoption of the income shifting response was immediate and pervasive across both rural and urban areas as well as young and old firms.

The paper also contributes to the literature examining changes in wage inequality trends following trade liberalization and highlights the need to check for changes in the tax environment while studying changes in skill premia or skill intensity, especially when using plant/firm level data.⁶ Our results thus provide a cautionary tale for event studies of regulatory changes in general, and studies of trade liberalization in particular. To be sure, this potential weakness of before-after studies of trade liberalization has been pointed out before; for example Tybout 2002 and Epifani 2003 argued that trade liberalization is often accompanied by a number of other macroeconomic and product market reform policies, and discussed the inability of such studies to separately identify the effects of different types of reforms.

Finally, our paper contributes to the literature examining the effect of liberalization on inequality in India. Given the large population of extremely poor people and the importance of poverty reduction as a policy goal, an extensive literature has examined whether poverty reduction has accelerated or decelerated after the reforms introduced in the early 1990s. This literature is intensely divided, with “no consensus on what happened to Indian poverty in the 1990s” (Deaton (2005)).⁷ There has been relatively little work on the effect of liberalization of wage inequality/skill premium.⁸ We find that, controlling for the spurious increase in measured wage inequality induced by tax law changes, there was little increase in wage inequality levels. There is a small upward trend in skill intensity (white collar share of wages), but we find no acceleration of this trend after the 1991 reforms (once we control for income shifting induced by the tax law change). Thus the 1991 reforms do not appear to have significantly worsened wage inequality at least over the four-year period following the reforms.

The rest of the paper is organized as follows. In the next section (Section 2), we briefly describe the relevant tax law changes introduced in the Finance Act of 1992, and the trade and other reforms introduced beginning in July 1991. In Section 3, we present a brief model

⁴One other factor that appears important here is capital deepening coupled with an increase in the skill premium for capital intensive firms in the post-1992 period (accounting for about 0.6% of the total change of 4.63% in white collar share of the wage bill).

⁵Gordon and Slemrod (1998) provides an overview of this literature.

⁶Even income inequality studies using individual/household survey data could be misleading for two reasons. One, as highlighted by Gordon and Slemrod (1998), in the presence of income shifting, non-wage income may be retained in the form of unrealized capital gains, which are difficult to measure and impute. Second, in our study, anecdotal evidence and tax notifications suggest that income accruing to individual partners through sharing firm profits was not being reported to tax authorities; it is thus likely that this income would not be reported in household surveys either.

⁷Topalova (2005) examines specifically the effect of tariff liberalization, and finds evidence that tariff liberalizations increased poverty levels.

⁸Note that increasing wage inequality is not the same as increasing poverty; for example, an increase in the wages for skilled labor could increase inequality without any negative effect on the extent of poverty.

capturing the implications of the tax reform for income shifting and measured wage inequality, and then describe different theories relating trade liberalization to increases in wage inequality. We describe the data and define the key variables used in our study in Section 4. In Section 5, we present empirical evidence on the direct income shifting consequences of the tax law change. In Section 6, we present empirical analysis of the trends in wage inequality. Section 7 summarizes our results and concludes.

2 Tax and Trade Reforms in the Early 1990s

2.1 Alternative Business Forms and the Tax Reforms of 1992

2.1.1 Alternative Business Forms

The three major choices for organizing a business in India are⁹: (i) Individual Proprietorships; (ii) Partnerships, and (iii) Companies (“Private or Public Limited Companies”). The Individual Proprietorship form is used by entrepreneurs who have sole ownership of the establishment. For establishments with multiple owners/shareholders, the two available alternatives for organization were options (ii) and (iii) above. In the pre-1992 period, the key benefit from choosing the “Partnership” form versus a “Private or Public Limited Company” form was that the corporate tax rates were significantly lower on partnerships (a top rate of 18% for Partnerships versus 45 to 50% for Companies – see Table 3). However, the key non-tax disadvantage of this form of organization was that the liability for partners was not limited. Post-1992, the difference in the tax rate between Companies and Partnerships narrowed considerably.¹⁰

The distribution of manufacturing sector establishments across different business forms for the year 1991 (the midpoint in our data period) is summarized in Table 2. As is evident from the table, the major form of business organization was the Partnership form (50%), followed by Companies (25.8%) and Individual Proprietorships (17.4%). Other forms include trusts, co-operatives and government departmental enterprises. In terms of total employment, Companies constituted the biggest share (50.9%), followed by Others (24.9%)¹¹, Partnerships (19.3%), and Individual Proprietorships (4.9%).

2.1.2 Tax Reforms of 1992

The main statute governing income taxes is the Income Tax Act (1961). Every year, the government (or specifically the Minister of Finance), proposes a budget (technically the “Finance Act”) in February/March, which announces tax rates applicable for the tax year beginning April 1 of that year. Thus, the Finance Act of 1992, would announce tax rates applicable for the fiscal year 1992-93 (April 1, 1992 to March 31, 1993), defined as 1993 in our dataset and all our analysis.¹²

⁹ See Chapter 3 of Ramani, et al (2004) for a detailed discussion of alternative business forms; most of the discussion there is applicable to the period we study (1987-1995). One key change was the tax treatment of partnership profits and salaries to partners. This is discussed in the section below.

¹⁰ See also the discussion in footnote 16. While there was not much change in the distribution of different business forms in the post-1992 period in our dataset, anecdotal evidence suggests that, more recently, there has been a trend towards the “corporate” form.

¹¹ Employment within Others is dominated by Government Departmental Enterprises.

¹² Technically, the rates are stated in the Income Tax Department publications as applicable for the next “assessment year”, to be applied to the “prior year”. Thus, tax rates announced in the Finance Act 1992 would be for the “assessment year” 1993-94, but would be applicable on income earned in 1992-93 (the “prior year” for the “assessment year 1993-94). This terminology reflects the fact that income for any year (e.g., 1992-93) is reported to the tax authorities in the next year (1993-94). The Finance Act would also often amend parts of the Income Tax Act. Procedures and rules are outlined in the Income Tax Rules,

Immediately prior to 1992-93, key provisions of the Indian Income Tax Act (1961), along with the rates announced in the Annual Finance Acts (or “Budgets”) implied the following tax treatment of remuneration and profits of partners in partnership firms:

- Profits of the firm were taxed twice. First, the firm had to pay tax on profits at the rate specified for registered (partnership) firms.¹³ Additionally, each partner’s share of the profits was to be added to the personal income of the partners and subject to tax at the rate specified for individuals.
- Any payment of interest, salary, bonus, commission or remuneration made by the firm to any partner of the firm was not deductible from revenues while determining taxable profits of the firm.

The net effect of the provisions was that there was a tax disincentive to paying salaries to partners of the firms (regardless of whether they worked at the firm). Any salary (or other type of remuneration) would be get taxed three times – first as profits at the hands of the firm (since salaries were not deductible), second as profits from business in the hands of the partner, and third as salary income in the hands of the partner.¹⁴

The double taxation of profits was introduced in the Finance Act of 1956, and was critiqued as early as 1958 by the Law Commission in their 12th Report.¹⁵ However, the double taxation provisions were retained in the tax until 1992.¹⁶

In early 1992, reports submitted by a committee set up to review Indian tax laws (called the Chelliah Committee) made a number of recommendations, including the abolition of the partnership double taxation provision. Following the recommendations, in the Finance Act of 1992 a number of amendments to provisions in the Income Tax Act relating to registered partnerships were introduced. The key changes (applicable for income earned in the period April 1, 1992 to March 31, 1993, and subsequently) were the following:

- Partnerships were allowed to deduct remuneration paid to “working” partners, within specified limits. “Working partners” were those specified as such in the partnership deeds.
- Profits of partnerships would be taxed only once, at the rate specified for the partnership firm. These profits would then be exempt from any further tax.
- Remuneration paid to partners were to added to their personal income (up to the limit that was deductible while calculating the firm’s taxable income). Thus, remuneration in excess of the specified limit which was not allowed to be deducted while calculating taxable profits

1962, and are revised through amendments to these rules, and through circulars and notifications.

¹³There are separate provisions relating to unregistered firms. Since our dataset covers only registered establishments, we will restrict attention to provisions for registered firms.

¹⁴The tax treatment of remuneration paid to the partners is not specifically referred to in the Income Tax Act prior to 1992. The only reference to remuneration to partners is to specify that these are not deductible while calculating a partnership firm’s taxable income (see section 40, Income Tax (1991)). From 1992, it is specifically stated in the Income Tax Act that remuneration to a partner would be treated as “Profits and Gains from Business or Profession” and added to the partner’s total taxable income (to the extent that these were deductible in the calculation of the firm’s taxable income). In the absence of these specific exceptions, in the pre-1992 period, salaries paid to a partner (like any other employee’s salary) would have to be added to his total income.

¹⁵The Law Commission was set up by the central government to recommend revision and updating of laws to serve the changing needs of the country.

¹⁶Note that the double taxation of profits was not unusual relative to other business forms. Under the alternate organization as a “Company”, profits paid out as dividends to shareholders were also subject to double taxation (first as profits in the hands of the Company, and then as Income at the Individual level). Since tax rates on profits for Partnerships was lower than for Companies (see Table 2), the net tax paid on profits received by the owners was lower for Partnerships. Also, tax paid by the partnership was deducted from the firm’s profits before allocation in the hands of the partners.

for the firm would also only be taxed once – in the hands of the partnership firm at the rate applicable to such firms. (This would not get added to the partner’s individual taxable income.)

At the same time, the Finance Act substantially raised the tax rate on partnerships, from a range of 10 to 18 percent in 1992 to a flat 40 percent beginning in 1993. The relevant tax rates on individuals, partnerships and other companies are provided in Table 3.

The net impact of the changes (specifically the provision allowing salaries to “working” partners to be deducted while calculating taxable profits, and the provision ruling out double taxation of non-deductible remuneration) was to remove the disincentives related to paying salaries to partners. In 1992-93 (and in later years), the tax rate up to a INR 100,000 (about USD 3500) was less than the tax rate on corporate income (see Table 3); so there was a positive tax incentive to pay out some amount of salary to working partners.¹⁷ The tax rates on other business forms did not change substantially at this time (and during the period of our study); the tax rate on various income brackets for individuals, which also affects single proprietorships, did decline somewhat in 1992-93. We model the impact of the tax provisions and the predicted behavioral response in Section 3.1.

2.2 Trade Liberalization and Other Economic Reforms of 1991

Significant reforms were introduced in 1991 that transitioned India from a closed, socialist economy to a more open, free-market oriented system. The proximate cause for the reforms was a severe balance of payments crisis in 1991. In June 1991 a new government came into power following mid-term elections; this government obtained funding from the international financial institutions (the IMF, the World Bank and The Asian Development Bank) and initiated a structural adjustment program on the advice of these institutions.

The three major reforms impacting the manufacturing sector were the liberalization of industrial, foreign investment, and trade policies regulations.¹⁸ The major industrial policy change was the extensive liberalization of licensing requirements for establishing and expanding capacity, a cornerstone of the pre-1991 industrial regulatory regime (which came to be called the “licence raj”).¹⁹ A modest easing of licensing norms had been undertaken in the late 1980s, and the industrial policy announced in 1991 extended de-licensing to almost all industries in the manufacturing sector. Another key reform announced in July 1991 was the significant relaxation of Foreign Direct Investment (FDI) regulations, especially for investments into designated high priority industries (known as “Appendix I industries”). The third major reform was the reduction in tariff rates across the board over the early 1990s. The rates dropped from an (un-weighted) average of about 85% in 1990 to about 60% in 1992. There was also a devaluation of the rupee by about 41% during the calendar year 1991 (from about INR 18.4/USD to about INR 25.8/USD), which counteracted the effect of the tariff reductions on import-competing industries, and gave a boost for exporting firms.

¹⁷Also, there was a standard deduction allowed on salary income (but not on income from business profits), which could have provided further incentives to pay out salaries to working partners.

¹⁸For a more extensive discussion of these and other reforms initiated in 1991 and continued through the 1990s, see Acharya (2002).

¹⁹For interesting anecdotal evidence on the significance of these reforms, see Delong (2001).

Other pro-market macroeconomic policies initiated in 1991 included moves to reduce the fiscal deficit, liberalization of technology and capital goods imports, devaluation of the local currency, transition to a market determined exchange rate and liberalization of capital markets. Since these reforms were pervasive and announced simultaneously, their effects are difficult to disentangle from each other and from other macroeconomic shocks. We discuss different theoretical explanations for increases in wage inequality following trade liberalization in Section 3.2.

3 1992 Tax Law Changes, Trade Liberalization, and Wage Inequality

3.1 A Model of Behavioral Responses to the 1992 Tax Reform

We consider a simple model that captures the key elements of the 1992 tax law and tax rate changes and predicts the behavioral responses of the partnerships affected by the tax law change.

3.1.1 Model Setup

We begin by taking as exogenous the choice of business form. While this choice could be affected by tax regulations (see e.g. MacKie-Mason and Gordon, 1997), our focus here is mainly on income shifting within firms.²⁰ Assume that a partnership generates a surplus per partner of S . The K identical partners need to choose an amount X to pay themselves as wages, while the remaining $S - X$ of the surplus becomes profits that accrue to the partners. The optimal value of X , denoted X^* , is chosen to maximize the after-tax income of the typical partner. In a world without taxes on wages or profits, the X choice would be trivial: the partners would be indifferent between paying themselves wages or receiving a share of the firm's profits.

3.1.2 Behavior in the Pre-92 and Post-1992 Tax Regimes

The tax system alters this indifference. To see this, note that the after-tax income per partner in the pre-1992 regime were given by:

$$\Pi = S[1 - t_f(P)][1 - t_i(I)] - Xt_i(I) + G[1 - t_i(I)] \quad (1)$$

where $t_i(I)$ is the *average* tax rate on the partner's individual taxable income which is a function of the level of the partner's taxable income I , $t_f(P)$ is the *average* tax rate on the income of partnerships which is a function of the level of the partnership's total income $P(= KS)$, and G is outside income for the typical partner. Here, the partner's individual taxable income I equals $S(1 - t_f(P)) + X + G$. Defining $\tilde{S} \equiv S(1 - t_f(P))$, after entity-tax partnership income, we have:

$$t_i(I) \equiv \frac{\int_0^I t_m(r)dr}{I} = \frac{\int_0^{\tilde{S}+X+G} t_m(r)dr}{\tilde{S} + X + G}, \quad (2)$$

where $t_m(r)$ is the marginal individual tax rate when the income level is r . Since the marginal tax rate increases with income (see Table 3 for details), the average tax rate increases with I

²⁰Another reason for abstracting from the choice of business organizational form is that we find no significant changes in the distribution of business forms around the time of tax law change. This is consistent with the fact that the new law did not alter the total tax on partnerships significantly, just the form of taxation, and by doing so affected the incentives to shift income but not the incentive to operate in one form versus the other.

and X . Also, since the salary paid to each partner (X) is not deductible in the pre-1992 period, P and $t_f(P)$ are independent of X . Given these facts, we get from Equation 1 that $\frac{d\Pi}{dX} < 0$, so that X^* is zero.²¹ Thus in the pre-1992 regime, no salary should be paid to the partners.

In the post-1992 regime, wages paid to partners were deductible, as long as they were below a specified fraction of total profits (see Appendix 1 for the specified limits). Wages above this cap, while not deductible in the calculation of the firm's taxable income, were exempt from individual income tax in the hands of the partner. Defining μ as $\frac{X}{S}$, we simplify the prescribed limits as one cap, specified as a fraction of the surplus ($\bar{\mu}$). Thus, after-tax income received per partner in the post-1992 regime equals:

$$\begin{aligned}\Pi(X) &= S - t'_f(P)(S - X) - t'_i(I)X + G[1 - t'_i(I)] \\ &= S[1 - t'_f(P)] + X[t'_f(P) - t'_i(I)] + G[1 - t'_i(I)]\end{aligned}\quad (3)$$

where $X \leq \bar{\mu}S$, and $t'_f(P)$ and $t'_i(I)$ denote post-1992 *average* partnership and individual tax rates at the partnership income level of P and the partner's individual income level of I , respectively. Because after 1992 the tax on partnership profits was changed to a flat rate (see Table 3), we have $t'_f(P) = t'_f$ (constant, independent of P). Also, post-1992 partnership profits were not taxed again in the hands of the partner, so $I = X + G$, and accordingly we have:

$$t'_i(I) \equiv \frac{\int_0^I t'_m(r)dr}{I} = \frac{\int_0^{X+G} t'_m(r)dr}{X+G}\quad (4)$$

where $t'_m(r)$ is the post-1992 marginal tax rate at an income level of r . Therefore, we get:

$$\begin{aligned}\frac{d\Pi(X|X \leq \bar{\mu}S)}{dX} &= t'_f - t'_i(I) - t'_m(I) + t'_i(I) \\ &= t'_f - t'_m(I)\end{aligned}\quad (5)$$

$$\text{and } \frac{d\Pi(X|X > \bar{\mu}S)}{dX} = 0\quad (6)$$

Note that t'_f is a constant at 0.40 (see Table 2), and that t'_m increases in steps as the income of the partner increases. Thus, as X goes up, so does the marginal individual income tax rate t'_m .

Given these facts, equation 5 implies that so long as the marginal individual tax rate applicable for the partner (t'_m), is below the tax rate applicable to the firm's income ($t'_f = 0.40$), each partner's post-tax income is increasing in X . Equation 6 indicates that once X exceeds the prescribed limit $\bar{\mu}S$, the partners would be indifferent about the choice of X . Thus, the optimal choice would be to increase X^* until the marginal tax rate applicable to the partner's personal income is just equal to the tax rate on the partnership firm.²² Thus the decision rule is:

$$X^* : t'_m(X^* + G) = t'_f\quad (7)$$

Based on this, we obtain the following predictions about post-1992 optimal behavior:

²¹From Equations 1 and 2, after some algebra we get:

$$\frac{d\Pi}{dX} = -t_i(I) - I \left(\frac{dt_i(I)}{dX} \right) = -t_i(I) - I \left[\frac{-\int_0^I t'_m(r)dr}{I^2} + \frac{t'_m(I)}{I} \right] = -t_m(I) < 0.$$

²²This all assumes that $S > 0$.

1. If G is small enough so that $t'_m(G) < 0.40$, then $X^* > 0$. From Table 2, this means that for 1992-93, 1993-94 and 1994-95, all partners whose outside income is less than INR 100,000 (\simeq USD 3500) would choose to pay themselves positive wages. Thus, for years 1992-93 to 1994-95, at equilibrium we would have $X^* + G \geq$ INR 100,000, because at income levels exceeding INR 100,000, the tax rate $t'_m = 0.40 = t'_f$.
2. Assuming at least some partners have $G <$ INR 100,000, the number of salaried partners post-1992 should be positive. If the designation of working partners is flexible (not subject to scrutiny or challenge by the tax authorities), we expect the number of partners receiving wages to equal the number of partners for whom outside income $<$ INR 100,000.
3. Assuming at least some partners have $G <$ INR 100,000 (\simeq USD 3500), declared profits for the partnership is less than S .

These behavioral responses will lead to the following observations for partnerships:

1. Unpaid (non-salaried) owners (proprietors and family members) as a fraction of total white collar employment should go down. If the tax law change is understood and acted on immediately by all firms, we should see a big downward adjustment in 1992-93, and little change thereafter.
2. Declared profits should go down after the tax law change (holding other factors constant), as some profits are shifted to wage income for the proprietors. Thus, profits as a proportion of sales should go down, and the total wage bill as a proportion of sales should go up after the tax law change.
3. The ratio of white collar wage bill (which includes wages to all white collar employees, including partners) to profits should go up.

Because the tax law changes were relevant only for partnership firms, we expect the above predictions to hold for this type of firm, and expect no similar changes for firms that have a different business form. This allows us to implement a difference-in-differences strategy by using the time-series of non-partnership data to serve as a control for the partnership data.²³

3.1.3 Effects on Measured Wage Inequality of Predicted Response to the 1992 Tax Law Change

Tax induced income-shifting will affect measured wage inequality. To see this, assume that both the white collar (W_w) and blue collar wage (W_b) rate stays the same ($W'_w = W_w, W'_b = W_b$) in the periods before and after the tax law change (i.e., we abstract from any factor that could change blue and/or white collar wage rates). The observed white collar share of the wage bill in the pre-1992 regime is:

$$wsh_{pre92} = \frac{W_w M}{W_w M + W_b N}$$

²³One issue that could impact our analysis is the significant administrative difficulties in taxing income at the individual level in India. One way to model this would be to assume that the effective marginal tax on individual income is $\gamma t_m(I)$, where $\gamma \in [0, 1]$ captures a range of outcomes between full compliance ($\gamma = 1$) and full tax evasion ($\gamma = 0$) on salary income. For all values of $\gamma > 0$ our basic results above would hold: there would be no incentive to pay any wage to partners in the pre-1992 period, while there would be an incentive to pay wages in the post-1992 period. In fact with lower effective taxation of salary income, there would be stronger incentives to pay out wages to partners in the post-92 period because the optimal X^* would increase as γ decreases (since the optimal X^* is given by $t'_f = \gamma t'_m(X^* + G)$, and $t'_m(X^* + G)$ is increasing in X^*). With complete tax evasion on salary income, $\gamma = 0$, in the pre-1992 period, partnerships would be indifferent about X^* , while in the post-1992 period partnerships would have an incentive to pay out the maximum amount of allowable wage income (i.e., $X^* = \bar{\mu}S$).

where M is the number of salaried white collar (non-production) employees and N is the number of blue collar employees. In the post-1992 tax regime this becomes:

$$wsh_{post92} = \frac{W_w M + X K}{W_w M + W_b N + X K}$$

where XK is the total amount of partnership profits shifted to white collar wage and salary income, and K is the number of newly paid partners. Clearly, $wsh_{post92} > wsh_{pre92}$.²⁴ Thus, as a result of the shifting of income from profits to wages by working partners induced by the 1992 tax law change, we expect the white collar share of wages to go up.

Observed wage inequality measured as ratio of white collar to blue collar wage rate in the pre-1992 regime also changes. Before 1992, it is:

$$skpr_{pre92} = \frac{W_w}{W_b},$$

and in the post-1992 regime it is:

$$skpr_{post92} = \frac{\frac{W_w M + X K}{M + K}}{W_b}$$

where J is the number of partners who receive wages in the post-1992 period. In our data, partners and family members who begin to receive wages after the 1992 tax law change would get reclassified from being “unpaid proprietors or family members” to paid “white collar workers”. Thus, measured wage inequality goes up if:

$$\begin{aligned} skpr_{post92} &> skpr_{pre92} \\ \frac{W_w M + X K}{M + K} &> W_w \\ X &> W_w \end{aligned} \tag{8}$$

Thus, if the amount of diverted profits per paid partner (X) is higher than the mean white collar wage rate paid by the firm, we would expect measured wage inequality to go up for partnerships after the 1992 tax law changes.

To summarize, our model predicts the following for partnerships:

1. The white collar share of wages should rise following the 1992 tax law change.
2. Assuming that the diverted profits per paid partner is higher than white collar wage rate, measured wage inequality (i.e., the skill premium) will go up. In our data, median wage per white collar employee was only about INR 15,000 (about INR 32,250 at the 90th percentile), much lower than the measured profit before tax per unpaid partner of about INR 37,000 (about INR 329,150 at the 90th percentile). Thus the assumption that transferred profits per partner was greater than wage rate for white collar employees is likely to hold for most of the firms, and hence we expect mean wage inequality to increase for partnerships.²⁵

²⁴Since $wsh_{post92} - wsh_{pre92} = \frac{W_b N X K}{(W_w M + W_b N + X K)(W_w M + W_b N)} > 0$.

²⁵Two factors reinforce this possibility. One, the ceiling on the optimal transfer (applicable for working partners with zero outside income) is INR 100,000, which is much higher than even the 90th percentile of observed mean white collar wage rates. Two, profits per “working partner” would be even higher than the profits per partner calculated above, increasing the likelihood that profits transferred per working partner are greater than the observed white collar wage rate.

3. Assuming that the diverted surplus per paid partner is uncorrelated with the white collar wage rate, the observed increase in wage inequality (skill premium) would be higher for firms with a relatively low white collar wage rate. Under the plausible assumption that income from other sources for “working” partners (G) is low, we know that the optimal diverted profits per employee $\frac{XK}{J}$ would be $\geq INR100,000$, subject to the availability of sufficient surplus. If firms limit the amount of income shifting to this amount, then all firms would divert about INR 100,000 per paid partner (assuming they make sufficient surplus).

Again, since the tax law changes were relevant only for partnerships, we expect the above predictions to hold only for this type of firm, and we expect no such changes to be observed for firms that have a different business form.

3.2 Theories of Trade Liberalization and Inequality

A number of studies have documented an increase in wage inequality following trade liberalization and the expansion of trade in many developing countries (see Kremer and Maskin 2003, or Goldberg and Pavcnik 2003 for an overview of this literature). We discuss briefly the main theoretical explanations for this link.

According to the simplest versions of the Heckscher-Ohlin model, developing countries should see a decrease in wage inequality following reforms because in this model developing countries do not have a comparative advantage in skill-intensive sectors, which would face import competition and which are protected prior to liberalization. Post-liberalization, according to the Stolper-Samuelson theorem that links product prices to wages, prices relatively decrease in the skill-intensive import sector, which in turn reduces the wages of skilled workers. However, evidence suggests that unskill-intensive sectors are the ones that in fact receive the most protection.²⁶ Thus, trade liberalization would lead to price drops in unskill-intensive sectors, leading to increases in skill premium consistent with the Stolper-Samuelson theorem.

An alternative argument for increasing wage inequality in developing countries following trade liberalization and the relaxation of foreign direct investment (FDI) regulations was proposed by Feenstra and Hanson (1996, 2003). They suggest that these reforms shift the production of intermediate goods from developed to developing countries. These products are skill-intensive from the point of view of developing countries (though relatively unskill-intensive from the point of view of developed countries, and hence outsourced to poorer countries). Thus, FDI generates demand for skilled workers. Another path through which FDI liberalization (coupled with reduction in tariffs and removal of other restrictions on import of capital) could affect skill premium is by increasing the use of capital; then if capital and skilled labor are complementary, this would lead to increased demand for skilled labor and hence an increase in the skill premium (Cragg and Epelbaum 1996, Behrman, Birdsall and Szelsky 2000).

Another source of increases in skill premium could be skill-biased technological change, which could be induced by trade liberalization in three possible ways. Wood (1995) and Thoenig and Verdier (2003) suggest that intensified import competition leads to greater R&D or adoption of technologies hitherto unadopted. These new technologies are generally skill-intensive, so that

²⁶An earlier study (Sivadasan (2005) shows that the largest tariff drops in Indian manufacturing were indeed in labor/low-skill intensive sectors. This somewhat anomalous protection of low-skill intensive sectors in developing countries has been documented by others (Goldberg and Pavcnik, 2005).

such skill-biased technological change leads to increases in skill premium. Acemoglu (2003) argues that tariff reductions lead to reduction in prices and hence increased imports of machinery, office equipment and other capital goods that are complementary to skilled labor. Aghion, Burgess, Redding and Zilibotti (2003) suggest that firms and sectors that are close to the technology frontier survive and thrive post-liberalization, but firms away from the technology frontier may be unable to fight external entry. These effects could lead to an overall increase in the skill premium, if the surviving domestic sector firms are close to the frontier and have higher skill-intensities.

In Verhoogen (2004), exporting requires high quality, which requires high skill intensity. Trade liberalization offers export opportunities and thus increases demand for skilled workers, which leads to an increase in wage inequality.

4 Data and Definition of Key Variables

The primary data source for this study is the Annual Survey of Industries (ASI), undertaken by the Central Statistical Organization (CSO), a department in the Ministry of Statistics and Programme Implementation, Government of India. The ASI covers all industrial units, called “factories” (equivalent to plants) registered under the Factories Act employing more than 10 persons (if the plant used electricity) or 20 persons (for plants not using electricity).²⁷ The ASI frame is classified into two sectors: the “census sector” and the “sample sector”. Factories employing more than 100 workers constitute the census sector. Roughly one-third of the units in the “sample sector” are enumerated every year (changed from a sampling rate of one-half in 1987-88). Since unit-level data on electronic media has only recently become available to researchers, the unit-level ASI data is only beginning to be exploited in empirical studies (e.g., Sivadasan, 2005).

Certain limitations of the ASI data have been highlighted in the literature. Pradhan and Saluja (1998) conclude that the ASI provides “fairly reliable data” on organized manufacturing activity, but “with a considerable time-lag”. Nagaraj (1999) highlights three other shortcomings of the ASI data: (i) incomplete coverage of factories, (ii) under-reporting of workers in factories covered, especially in small factories, and (iii) under-reporting of value added. He indicates that the underreporting may have increased over time. The questions we address are fortunately not significantly affected by these shortcomings in the data. The lag in reporting the data does not affect us as we are looking at historical data. The under-reporting issues highlighted by Nagaraj do not bias our difference-in-difference estimates, under the reasonable assumption that the pattern of under-reporting does not change differently across the liberalized versus the non-liberalized groups, or across one type of ownership group versus other types of ownership groups.

In addition to the ASI, we use various other sources of data on the Indian economy. We obtain information on tax rates for corporations and individuals from various volumes of the Statistical Abstract published annually by the Central Statistical Organization and from the website of the

²⁷Manufacturing activity undertaken in the informal sector (households (own-account) and unregistered workshops) are not covered by the ASI. Like other low income countries, India had a large fraction of employment in the informal sector; according to estimates in Subrahmanya [2003], the employment share of the formal manufacturing sector was about 21.6% in 1989-90. Factories are analogous to plants, but are different from firms; multi-establishment firms would have multiple plants/factories.

Income Tax department in Delhi.²⁸ Information on the sectors liberalized for Foreign Direct Investment was obtained from the Handbook of Industrial Policy and Statistics issued by the Office of the Economic Advisor, Ministry of Industry, Government of India. Data on tariff rates were obtained from the World Bank Trade and Production database. Other data sources used include the annual Economic Surveys published by the Ministry of Finance, the Income Tax Act for various years from the website of the Central Board of Direct Taxes²⁹ and data from various government websites. Information on partnerships and other legal entities were obtained from various commentaries on the website www.laws4india.com, including chapter 3 of Ramani et al (2004).

The ASI dataset and the data collected from other sources were collated and cross-indexed using different concordance tables. Indian data authorities use a National Industrial Classification (NIC) scheme that is close to the International Standard Industrial Classification (ISIC) scheme; we created a concordance between the NIC (1987 revision) and the ISIC (1997) by carefully comparing definitions of specific codes. The wholesale price index data is collated using another product classification scheme, and this was cross-indexed to the NIC (1987) revision by comparing individual categories under both the classification schemes. Many variables in the ASI dataset had to be standardized for consistency across the years. A detailed data appendix describing the ASI dataset and the various steps undertaken to clean the data is available on request from the authors.

We obtained unit-level ASI data for the nine-year period from 1986-87 to 1994-95 from the CSO. The data is reported on a financial year basis: e.g., the 1986-87 year refers to the period April 1, 1986 to March 31, 1987. (Hereafter we refer to year 1986-87 as 1987 and so on.) There are about 50,000 plants in every year, yielding about 450,000 plant-year observations for the full dataset. For our analysis, we exclude extremely small plants (less than or equal to 5 employees), as the data on these plants appear to be noisy.³⁰

The definitions of key wage and employment variables are explained in Table 1. Key points to note are that we have three broad categories of employees reported (i) Blue collar/production workers (blue), (ii) Paid White Collar Workers (white_paid), and (iii) Working Proprietors and Unpaid Family members (prop). We define the white collar wage rate as the total white collar wage bill divided by the number of paid white collar workers. The blue collar wage rate is defined as total blue collar wage bill divided by the number of blue collar workers.

To analyze the effect of the tax law changes of 1992, we examine four variables: (i) “Fraction of non-salaried owners” is defined as “Working Proprietors and Unpaid Family members” (prop) divided by the total white collar employment (white_paid + prop); (ii) “profits-to-sales Ratio” are the Profits before Taxes (reported as “profits” in the dataset) divided by the “Gross Sales” (reported in the dataset); (iii) “Wage Bill to Sales Ratio” is defined as the ratio of the total wage bill to “Gross Sales”. The total wage bill is equal to the sum of the blue collar wage bill (bwbill)

²⁸<http://incometaxdelhi.nic.in/taxsys/old.htm>

²⁹<http://www.taxmann.com/TaxmannDit/DisplayPage/dpage1.aspx>

³⁰ This set of small plants constitutes about 3.75% of the manufacturing sector plants, but represents only 0.06% of total output, 0.19% of employment and about 0.91% of total capital. While the sampling frame for the survey is the register of plants that employ more than 10 employees, the actual dataset includes many firms with less than 10 employees. This arises because many plants get registered even if they employ less than 10 people, even though they are required to register only if they exceed the 10 person limit. Also once the plant is registered, it would continue to be in the sampling frame even after the employment levels dropped below the 10 person threshold.

and the white collar wage bill (wwbill).³¹ We define two related measures of wage inequality: (i) the skill premium, which is defined as the ratio of blue collar wage rate to white collar wage rate, and (ii) the white collar share of the total wage bill.

The dataset is based on a survey of plants, while tax laws apply at the firm level. Because there could be many firms that have multiple plants within them, this raises two measurement-related issues. The first issue is how profit is calculated at the plant level. Plant-level profits in our dataset are calculated based on subtracting from reported gross sales the materials costs, total wage bill, interest expenses, total rent and depreciation. This reported profit could be a noisy indicator of the firm-level taxable profits for two reasons. First, for multi-plant firms, profits at the firm level would be an aggregate of plant-level profits, and if the profitability of different plants are not perfectly correlated, regressions using plant-level data could yield different results from using firm-level data. Secondly (for both multi- and single-plant firms), profits reported here are based on accounting numbers for sales, material expenses and depreciation that could differ from the firm-level taxable profits for various reasons (for example, depreciation rates under tax laws differing from those used under Indian accounting standards). We expect these measurement issues to be stable over time, and have no reason to expect the resulting measurement error to systematically upward bias our estimates of the tax law change.³²

The second issue with using plant-level data is whether the estimates of income shifting and measured wage inequality effects predicted at the firm-level would be biased (upwards or downwards) when looking at plant-level data. Because, the incentives to shift income from profits to wages should apply to all the establishments within the firm, we expect the shift to show up in the plant-level data too. Again, we do not expect measurement errors from aggregation and differences between tax and accounting data to systematically bias our results upward.

5 Empirical Evidence on Direct Effects of 1992 Tax Law Change

Here we present results from examining the behavioral implications of the tax law change, on four variables: (i) unpaid owners as fraction of white collar employment; (ii) profits-to-sales ratio, (iii) total wage bill to sales ratio, and (iv) the ratio of white collar wage bill to profits.

5.1 Trends

In figure 1, we present trends in the ratio of unpaid owners to white collar employment for different types of business forms. As predicted by the model, the ratio of unpaid owners to white-collar employees falls sharply for partnerships after 1992. Significantly, there are no such effects for other categories of firms. Also note that unpaid owners are a much larger fraction of white collar employment in sole proprietorships and partnerships compared to other business forms, as may be expected due to their generally smaller size.

Figure 2a shows the trends in the ratio of profits-to-sales for partnerships. The ratio of profits to sales goes down in 1993 for partnerships. In figure 2b, we find that the ratio of total wages

³¹Refer to Table 1 for definitions of the wage bill variables bwbill and wwbill.

³²In fact classical measurement error in the variables could bias our estimates downward. The problem of aggregation may be less severe for partnership firms, as they are generally smaller and hence more likely to be single plant firms.

to sales goes up for partnerships following the tax law change. In figure 3, we see that the ratio of white collar wage to profits goes up significantly beginning in 1993.

All of these results are consistent with our model’s predictions about the impact of the tax law change that allowed wage payments to partners to be deducted from the partnership firm’s taxable income beginning in 1993, prompting partners to begin paying themselves wages. This moves some amounts from profits to the white collar wage bill in our data. This shifting of income from profits to partners’ wage payments results in the changes observed in figures 1, 2a, 2b and 3.

Note that in all our figures we examine trends in medians rather than means because the mean value of these variables are skewed; since all of them are ratios, true or measurement error that causes denominators close to zero give rise to extreme outliers which severely skew the mean.

In the next section, we examine regression specifications that allow us to examine the size and statistical significance of the effects observed in these figures controlling for different factors.

5.2 Regression Results: Baseline Specifications

Table 4a presents the results of a series of multivariate regression analyses of the four indicators of tax-induced income-shifting. The specifications include various fixed and year effects to control for possible omitted variables. All dependent variables are winsorized by 2% on both ends of the distribution, to prevent outliers from skewing the mean effects.

In the first specification, we identify the effect of the tax law change, as the difference-in-difference effect on partnerships of the tax change, captured as year dummies for 1993, 1994 and 1995 (1987 is the omitted year in these specifications). Inclusion of year effects implies that the coefficient on the interaction between the period dummy and the partnership dummy captures the difference-in-difference effect of the reform on partnerships relative to all non-partnership businesses. We include state-industry-size dummy variables to control for unchanging location-industry-size effects.

In the second specification for each of the four indicators, we control for common state-industry-year shocks; thus, if the effects in the first regression are driven by peculiar shocks to certain locations or industry which are correlated with the partnership dummy (for example, if partnerships are disproportionately concentrated in some location or industry which receives some external shock), this specification would control for those shocks.

We find that, in both the specifications and for all four variables of interest, there is a large and significant difference-in-difference effect of the Finance Act of 1992 on income-shifting in partnerships. We find a 10 to 14% decline in fraction of non-salaried owners among partnerships immediately following the tax law change, relative other firms in the same state-industry cell. Similarly, we find a 2.2% to 3.3% decline in the profits-to-sales ratio. The wage bill to sales ratio goes up in the post-tax change period (by about 2.5% to 2.9%), while the ratio of the white collar wage bill to profits goes up significantly, by between 38% and 46.5%, in the post-reform period. All these effects are significant at the 1% level. These regressions thus confirm the impression from the graphs that 1993 marks a sharp divergence in behavior between partnerships and other businesses not affected by the Finance Act of 1992.

For the profits-to-sales and the wages-to-sales ratios, there is some upward trend in the variables prior to the reform period. The relative effects are the starkest for the fraction of un-salaried owners and for the ratio of white-collar wage bill to profits. For the latter two variables, there are no economically or statistically significant changes in the years before the tax law change; in contrast there are large and statistically significant effects in the years after the tax law change. Because there are no large changes in the coefficients between specifications 1 and 2, we can conclude that these estimates are not driven by state-industry time shocks coincident with the tax-law change. Finally, note that the pattern of the estimated coefficients (especially for the two variables where the tax law effect is the strongest) suggests that the biggest change occurred in the year 1993 (the year the tax law change came into force); this suggests that there was relatively rapid learning about the implications of the law.³³

6 Empirical Analysis of Wage Inequality Measures

6.1 Trends

Because the tax change of 1992 followed closely on the heels of the liberalization initiatives of 1991, the impact of the former on income shifting between profits and white collar wages could affect the analysis and conclusions about the implications of the latter. To begin to address this issue, first look at Figure 4, which presents trends in different percentiles of the distribution of the log wage inequality (skill premium) over the years, and Figure 5, which presents different percentiles of the white collar share of the wage bill. Both figures are for the full sample of firms in the dataset. As is evident from the graphs, both the skill premium and the white collar share of the wage bill show a significant increase (across different percentiles), but the sharp increase begins in the year 1993 (which corresponds to fiscal year 1992-93), the first year for which the new tax provisions became effective.

In figures 6 and 7, we examine the trends in the mean of the two wage inequality measures, for different business forms. It is evident that there was a big increase in the mean log skill premium for partnerships beginning in 1993. Strikingly, the magnitude of this jump is much higher than the changes experienced by any other type of business.³⁴ Similarly, in figure 6, we find a jump starting in 1993 in the white collar share of wages, which is again much more striking for partnerships.

These figures are consistent with the model predictions (assuming that the partnerships transferred surplus per partner greater than then pre-1993 average white collar wage). Taken together with the results in Section 5 above, these graphs suggest that partnerships shifted income from profits to wages, and that this change had a significant effect on the observed overall average

³³We also ran this analysis separately for rural and urban firms, and also for old and young firms. The results suggest a slightly faster response rate in urban locations (the coefficient on the urban only regression are somewhat bigger than that for the full sample). On fraction of non-salaried owners, response of urban partnerships was quicker and larger than rural partnerships; similarly, the effects are stronger on urban partnerships on the white-collar wage bill to profits ratio. The differences are not stark for the other two variables (profits-to-sales and wages-to-sales ratio). Similarly, there is some evidence of a slightly faster response by older partnerships, on fraction of unpaid owners, and on white collar wage to profit ratio. The differences are less striking for the other two variables of interest. We conclude that the learning about the tax law change was quite rapid in both urban and rural locations, and also across old and young firms, with weak evidence for a slightly faster and larger response by urban and older partnerships.

³⁴There is some increase in skill premium for public limited companies, but the magnitude is smaller than the jump for partnerships.

trends in skill premium.

Note that the overall mean for the population is heavily affected by the changes for partnerships. Since partnerships constitute 50% of the total number of firms (see Table 2), the overall population mean is impacted equivalent to half the magnitude of the mean effect on partnerships. From Table 2, we can see that the impact of partnerships would be somewhat reduced (but would still be significant) if we look at employment-weighted aggregate means of skill premiums and white collar wage bill shares.

6.2 Regression Results: Baseline Specifications

Next, we investigate this issue more closely by performing a series of regression analyses of the observed trends in log skill premium and skill intensity (white collar share of wages). We regress these measures on time dummies, controlling for state-industry-size fixed effects (i.e., we define cells by state, industry and size, and include dummies to capture fixed effects for each cell). We also include interactions of the time dummies with a dummy for partnerships.

The results are presented in Table 5a. In columns one and three the independent variables are year dummies; the omitted year is 1987. In columns two and four, we summarize the trends using period dummies – period 0 (which is omitted in the regressions) refers to years 1987, 1988, 1989 and 1990; period 1 refers to the transition period of 1991 and 1992, and period 2 refers to the period after the tax law change (1993, 1994 and 1995).

In columns 1,2, 3 and 4, we examine the log skill premium (ratio of white collar to blue collar wage rates). We find that almost all of the observed increase in the mean log skill premium can be attributed to changes made by partnerships. All the year coefficients after the 1992 tax law change (1993, 1994 and 1995 year dummies) lose statistical and economic significance, once we control for changes made by partnerships. The year effects are summarized in the regressions with period dummies (column 2 and 4). We see that there was approximately a 7.6% increase in the skill premium³⁵ in the period after the tax law change. However, once we control for actions taken by partnerships, this effect completely disappears. Thus all of the post tax-change increase in wage inequality could be attributed to changes made by partnerships. We argue that for partnerships, these changes reflect the tax-induced income-shifting rather than liberalization induced real effects in skill premia.

In columns 5, 6, 7, and 8, we examine the white collar share of labor (scaled by 100, so it is expressed in percentage terms). We find that there is an increase in the mean white collar share of wages of about 4.6 percentage points (coefficient on dummy for period 2) following the tax law change (from about 26.7% in the pre-1991 period to about 31.3%). We find that the coefficient on period 2 drops to 1.08% after we control for changes in partnerships; thus about 77% of the increase (3.55% out of 4.63%) in the mean white collar share of wages can be attributed to changes made by partnerships, which reflect income shifting due to the 1992 tax law change.

The results of regressing the log skill premium and the white collar share of wages on year dummies are summarized in Figure 7 and 8 respectively. As can be seen in the figure, the big jump in the mean skill premium and white collar share of wages in 1993 disappears when we

³⁵Expressing changes in logged skill premium as percentage changes. This is only approximate, and hold better for small log point changes; the actual percentage change would be larger when the log point changes are large.

control for the 1992 tax change (by conditioning out the actions of partnerships). Thus the big jump in 1993 appears driven by the tax law change.

6.3 Regression Results: Robustness to Trade Liberalization-related Causes

Because the jump in skill premium and white collar share of labor is observed some months after major reforms to trade and investment regulations were announced in July 1991, we should consider a number of plausible alternative explanations for the observed trends, based on the various theoretical explanations proposed for increases in skill premium following trade liberalization discussed in Section 3.2.

In section 6.2, to identify the effects of the tax change, we attributed the behavior of partnerships (relative to other types of corporate entities) as being driven by the tax law change that affected only partnership firms. This difference-in-difference strategy controls for the pervasive effect of the number of different reforms introduced in 1991. To the extent that the market for skilled labor is common across types of firms within and/or across industries, common year effects would control for the effect of trade-liberalization related causes of increases in skill premium.

However, the difference-in-differences identifying strategy could fail, if it was the case that some other change was driving the behavior of a certain groups of firms (say in certain industries) and partnerships happened to be concentrated among those firms (or those industries). For example, the market for skilled labor may be segmented, so that the various trade-related causes of increased demand for skilled labor affects certain industries more than others, and partnerships may be disproportionately concentrated in some of the most-affected industries. To control for this, in Tables 5b and 5c, we include additional controls for dynamic effects on specific industries and/or firms.

The first alternative story we examine is the reduction in tariff rates.³⁶ As discussed in Section 3.2, Stolper-Samuelson effects could drive the skill premium and share of white collar wages up in tariff liberalized industries. There was a significant reduction in tariff rates in India in 1991. So in column 3 of Table 5a and 5b, we include a variable that measures the drop in tariff between 1990 and 1992 at the 3 digit industry level (“fallu9092”), as well as this variable interacted with period dummies. If the skill premium increased in the post-1991 period in industries where tariffs were reduced, then this tariff drop variable interacted with the post-1992 period dummy would pick up the effect (and the coefficient on the post-1992 dummy would fall).

Next, we consider the trade orientation of the industry. We use two measures – export orientation, measured as the mean ratio of exports to output by industry for the pre-1991 period (“prexrat”); and import orientation, measured as the mean ratio of imports to output by industry for the pre-1991 period (“primrat”). If the Thoenig-Verdier or Wood type argument is true, we could expect the largest increases in skill premium to be concentrated among import-competing industries. If the Verhoogen (2004) explanation is true, we would expect the largest increases in skill premia in the export-oriented sectors. Third, we consider liberalization of foreign direct investment, measured as a dummy variable equal to one for industries that were opened to

³⁶As mentioned above, each of these alternative controls are required only if the markets for skilled labor are segmented, so that increases in skill-premia are concentrated in certain industries. Dissipated effects are captured by the year effects in Table 5a.

majority foreign direct investment in 1991. If the Feenstra-Hansen argument holds, we could expect the strongest effect in the industries for which FDI was liberalized. Fourth, we include a control for the capital-output ratio. If trade liberalization increases demand for capital and if skill is complementary to capital, we should see increases in the skill-premium and white collar share of wages driven by capital deepening. Finally, to address the explanation offered by Aghion et al, we include distance to the frontier, measured as the ratio of maximum (over all 4 digit industries) industry mean log total factor productivity to the industry mean total factor productivity.

Our results in Table 5b show that none of the trade-related explanations reduce the significance of the effect of partnerships on log skill premium. Distance to the frontier is weakly significant by itself, but loses significance when all other controls including the partnership dummy are included.³⁷ The inclusion of all the other controls has very little effect on the partnership dummy, and explains very little of the post-1992 jump in log skill premium. Similar results obtain for the white collar share of wages in Table 5b. The one exception is that the capital output ratio appears to be important, both by itself (column 7) and with other controls (column 9). Also, the combined regression (column 9) explains about half of the remaining increase in white collar share of wages in the post-1992 period (1.083% drops to 0.53%). This suggests that, consistent with arguments made by Cragg and Appelbaum (1996) and Behrman, Birdsall and Szekely (2000), increases in capital intensity (as well as the increased skill-premium for capital intensive firms), play a significant role in explaining the patterns in the white collar share of wages. Again, distance to the frontier is significant by itself, but drops in significance once other controls are included. The coefficient on partnership dummy drops very slightly in the combined regression (column 9).

Overall we interpret our results as strong evidence that the observed increase in the measured log skill premium and the white collar share of wages were driven primarily by the income shifting behavior of partnerships following the tax changes of 1992, even controlling for the effects of trade liberalization, trade orientation interacted with liberalization (through period dummies), FDI liberalization, capital deepening and distance to the frontier.

7 Conclusions

In 1992, India changed its income tax law in a way that provided partnerships incentives to shift income from profits to wages. We find in the data that there was a strong response to these incentives. The fraction of non-salaried owners, profits-to-sales ratio, the wage to sales ratio and the white collar wage to profits ratio, all change as predicted by economic theory. Crucially, because the tax law change affected only partnerships, we are able to identify the effects of the tax law change by comparing outcomes for partnerships relative to other business entities. The data allow us to control for a variety of fixed effects, and also for industry-location specific time-varying shocks that could affect the variables of interest.

The income shifting behavior has important implications for measured wage inequality. This is especially important because the tax law change followed by just one year a major trade and market liberalization that might by itself have caused shifts in the skill premium, and thus wage

³⁷ This would be consistent with partnership firms being concentrated in industries further from the frontier, as defined here.

inequality. We find that, without controlling for the tax law change, there is an increase in the mean skill premium of about 7.3 percentage points (significant at the 1% level) in the post-1992 period. Similarly, there is an increase in the mean white collar share of the wage bill of 4.6 percentage points (significant at the 1% level). However, once we condition out the effect of the taxes (by conditioning out responses by partnership firms), we find only a 0.8% point increase in the log skill premium and a 1.1% increase in the white collar share of the wage bill. Our analysis thus suggests that the major Indian trade and market liberalization measures announced in 1991 did not significantly affect wage inequality in the Indian manufacturing sector, at least in the four years following the liberalization.

Our findings provide evidence for rapid and large responses by business entities and individuals to incentives provided by tax law changes. As suggested by Slemrod (1990), income shifting is particularly responsive to tax incentives. The results discussed here also suggest that tax law changes could have important consequences for studies of wage inequality that rely on data that could be polluted by tax-induced income-shifting behavior, as have a number of studies of wage inequality that have used manufacturing sector survey datasets similar to ours. As demonstrated in our study, income shifting from profits to wages (or vice versa) could significantly bias measured wage or income inequality in these types of datasets.

Finally, our study provides a cautionary tale with regard to event studies that use a before-after approach to identify the effect of government interventions/policy changes or other events. For example, a number of studies, especially the early studies of trade liberalization used the before-after approach to identify the effects of liberalization on productivity and wage inequality.³⁸ Other tax or regulatory changes coincident with the event being studied could significantly affect the outcome of the investigation, unless strategies are adopted to control for these other changes.

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Appendix 1: Restrictions on deductible remuneration to partners in the Finance Act, 1992³⁹

The amount of remuneration paid to “working partners” that is deductible while calculating the partnership firm’s taxable profits is limited to:

- | | |
|--|--|
| (a) on the first Rs. 75,000 of the book-profit, or in case of a loss | Rs. 50,000 or at the rate of 90 per cent of the book- profit, whichever is more; |
| (b) on the next Rs. 75,000 of the book-profit | at the rate of 60 per cent; |
| (c) on the balance of the book-profit | at the rate of 40 per cent |

³⁹Extract from Section 40(b) of the Income Tax Act, 1961, after amendments introduced by the Finance Act, 1992.

Table 1: Definition of key variables (traced back to primary variables in the data)

Variable	Label	Definition	Source
Employment variables			
totwrkrs	Workers (Nos.)	Equivalent to blue collar/ production workers	In Data
totemp	All Employees (Nos.)	=totwrkrs + supervisory and managerial staff + other employees	In Data
totpersons	Total Persons Engaged	=totemp + working proprietors + unpaid family members	In Data
blue	# of Blue Collar workers	=totwrkrs	Defined
white	# of White Collar Workers	=totpers - totwrkr	Defined
prop	# of Proprietors & Family Members	=totpers - totemp	Defined
white_paid	Paid White Collar Employees	=white - prop ¹	Defined
Wage variables			
wages	Wages to Workers	=wages to blue collar workers	In Data
salaries	Salaries to Employees	=Wages to blue collar plus wages to white collar	In Data
bwage	Blue Collar Wages	=wages	Defined
wwage	White Collar Wages	=salaries-wages	Defined
bonuswrkrs	Bonus Paid to Workers	=bonus to blue	In Data
bonusemp	Bonus to Employees	=bonus to blue + white	In Data
bbon	Blue Collar Bonus	=bonuswrkrs	Defined
wbon	White Collar Bonus	=bonusemp-bonuswrkrs	Defined
wemol	White Collar Emol. (Wages + Bonuses)	=wwage+wbon	Defined
bemol	Blue Collar Emol. (Wages + Bonuses)	=bwage+bbon	Defined
totben	Total value of benefits to all Empl.	=contribution to PF + welfare expenses	In Data ²
wben	White Collar Benefits	=totben*wemol/(wemol+bemol)	Defined
bben	Blue Collar Benefits	=totben*bemol/(wemol+bemol)	Defined
bwbill	Total Blue Collar Wage Bill	=wemol + wben	Defined
wwbill	Total White Collar Wage Bill	=bemol + bben	Defined
Wage rates, Skill premium, and White collar share of wage bill			
bwrate	Blue Collar Wage Rate	=bwbill/blue	Defined
wwrate	White Collar Wage Rate	=wwbill/white_paid	Defined
skprem	Skill Premium	=wwrate/bwrate	Defined
wshare	White Collar Share of Wage Bill	= wwbill/(wwbill+bwbill)	Defined ³
log_skpr	Log (Skill Premium)	=log(skprem)	Defined
log_wsh	Log(White Collar Share of Wage Bill)	=log(wshare)	Defined

1. Assuming proprietors & family do not get paid any remuneration.
2. Subcomponents aggregated for 1987 and 1988.
3. Winsorized by 0.5% on both sides of the distribution to control for outliers.

Table 2: Different Types of Business Entities in the Indian Manufacturing Sector for a Single Cross-section (year 1991, adjusted for sampling weights)

Corporate Type	Number of Plants	Fraction (number)	Total Employment	Fraction (Employment)
Partnership: Joint Family	6,962	7.6%	202,429	2.5%
Partnership: Other	39,016	42.4%	1,383,364	16.8%
Partnerships: Total	45,978	50.0%	1,585,793	19.3%
Private Limited Company	16,035	17.4%	1,099,042	13.4%
Public Limited Company	7,678	8.4%	3,091,401	37.6%
Companies: Total	23,713	25.8%	4,190,443	50.9%
Individual Proprietorship	16,027	17.4%	404,726	4.9%
Others	6,204	6.7%	2,044,163	24.9%
Total	91,922	100.0%	8,225,124	100.0%

Table 3: Tax rates for different entities (1986-87 to 1994-95)

	1986-87	1987-88	1988-89	1989-90	1990-91	1991-92	1992-93	1993-94	1994-95
Individuals									
0 to 18,000		0%	0%	0%	0%	0%	0%	0%	0%
18 to 22,000		25%	25%	20%	0%	0%	0%	0%	0%
22 to 25,000		25%	25%	20%	20%	20%	0%	0%	0%
25 to 28,000		30%	30%	30%	20%	20%	0%	0%	0%
28 to 30,000		30%	30%	30%	20%	20%	20%	0%	0%
30 to 35,000		30%	30%	30%	30%	30%	20%	20%	0%
35 to 40,000		30%	30%	30%	30%	30%	20%	20%	0%
40 to 50,000		30%	30%	30%	30%	30%	20%	20%	20%
50 to 60,000		40%	40%	40%	40%	40%	30%	30%	20%
60 to 100,000		40%	40%	40%	40%	40%	30%	30%	30%
100 to 120,000		50%	50%	50%	50%	50%	40%	40%	30%
120 to 150,000		50%	50%	50%	50%	50%	40%	40%	40%
>150,000		50%	50%	50%	50%	50%	40%	40%	40%
Partnership firms									
0 to 10,000		0%	0%	0%	0%	0%	40%	40%	40%
10 to 15,000		5%	5%	5%	0%	0%	40%	40%	40%
15 to 25,000		5%	5%	5%	6%	6%	40%	40%	40%
25 to 50,000		7%	7%	7%	6%	6%	40%	40%	40%
50 to 100,000		15%	15%	15%	12%	12%	40%	40%	40%
>100,000		24%	24%	24%	18%	18%	40%	40%	40%
Public Ltd Cos (Domestic)		50%	50%	50%	40%	45%	45%	45%	40%
Private Ltd Cos (Domestic)		55%	55%	55%	45%	50%	50%	50%	40%
Cooperatives									
0 to 10,000		15%	15%	15%	10%	10%	10%	10%	10%
10 to 20,000		25%	25%	25%	20%	20%	20%	20%	20%
>20,000		40%	40%	40%	35%	35%	35%	35%	35%

Union surcharge on income-tax:**Partnership firms:**

1. For the year 1989-90: 8 per cent of income-tax if total income exceeds Rs.50,000/-.
2. For the year 1991-92: 12 per cent of income-tax if taxable income exceeds Rs.75,000/-.
3. For the years 1992-93 and 1993-94 12% of income tax if taxable income exceeds Rs. 1,00,000

Individuals (residents only)

1. For the year 1989-90 : 8 per cent of income-tax if total income exceeds Rs.50,000/-
2. For the years 1990-91 and 1991-92: 12 per cent of income-tax if taxable income exceeds Rs.75,000/-
3. For the years 1992-93 and 1993-94: 12 per cent of income-tax if taxable income exceeds Rs.1,00,000/-
4. For the assessment years 1994-95: Nil

Domestic companies:

1. For the year 1989-90: 8% of income-tax, if total income exceeds Rs50,000/-
2. For the years 1990-91 to 1994-95: 15% of income-tax, if total income exceeds Rs75,000/-

Coops:

1. For the year 1989-90: 8 per cent of income-tax if total income exceeds Rs.50,000/-
2. For the years 1990-91 and 1991-92: 12 per cent of income-tax if taxable income exceeds Rs.75,000/-
3. For the years 1992-93 and 1993-94: 12 per cent of income-tax if taxable income exceeds Rs.1,00,000/-
4. For the year 1994-95: Nil

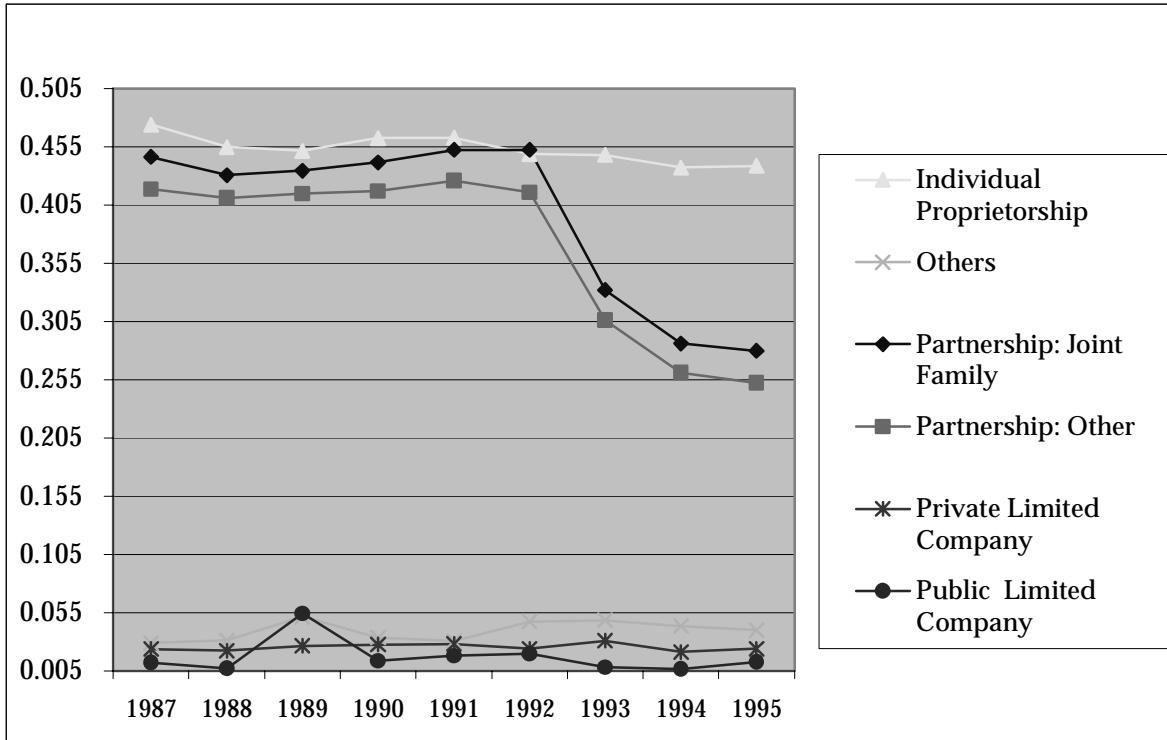


Figure 1: Proprietors and Unpaid Family Members as a Fraction of Total White Collar Employment

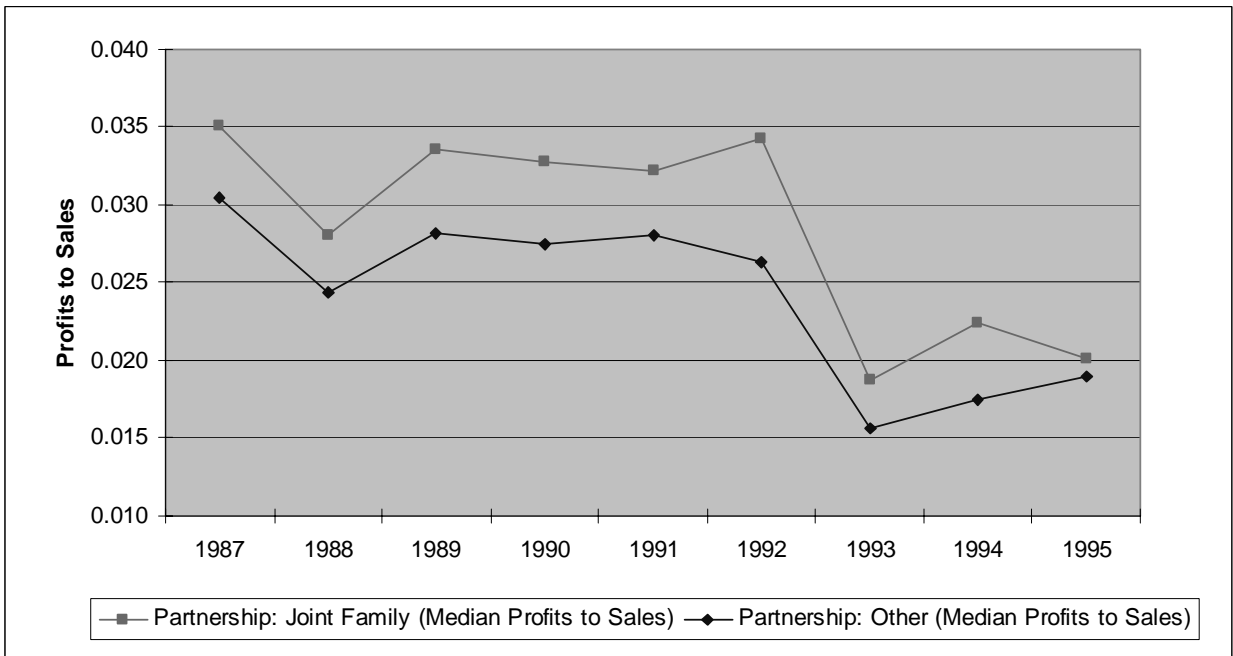


Figure 2a: Median Profits-to-Sales Ratio for Partnership Firms

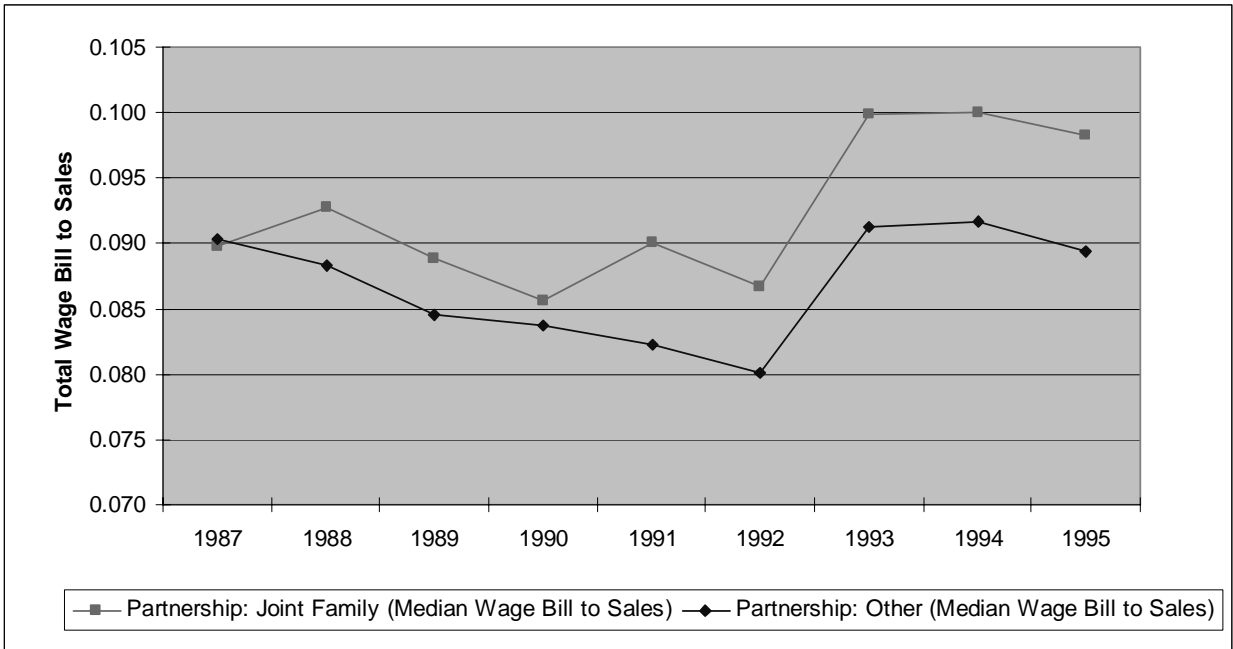


Figure 2b: Median Total-Wage-Bill-to-Sales Ratio for Partnership Firms

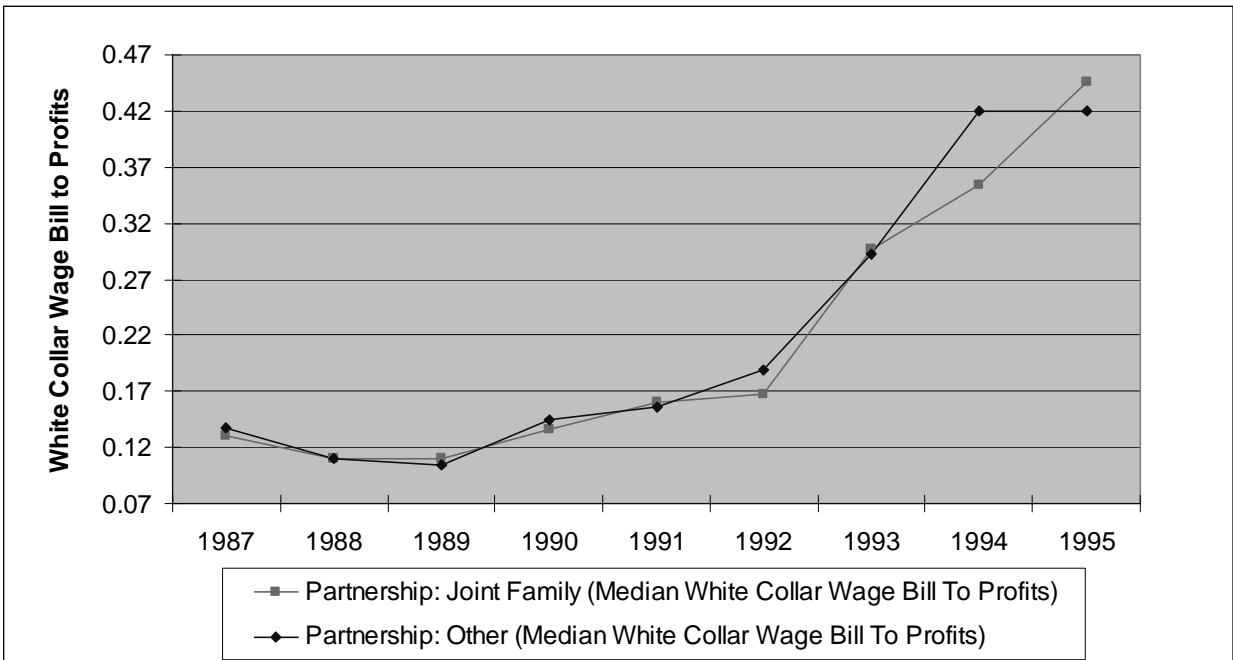


Figure 3: Median White-Collar-Wage-Bill-to-Profits Ratio for Partnership Firms

Table 4a: Regressions estimates of the direct effect of the tax law change: Baseline regressions on full sample
(All dependent variables are winsorized by 2% on both ends of the distribution)

	Fraction of Non-Salaried Owners		Profits-to-Sales Ratio		Wage-Bill-to-Sales Ratio		White-Collar-Wage-Bill-to-Profits Ratio	
	1	2	1	2	1	2	1	2
D_partner	0.155	0.193	0.054	0.058	-0.039	-0.044	-0.057	-0.019
(yr==1988)*D_partner	[0.008]**	[0.012]**	[0.004]**	[0.005]**	[0.004]**	[0.006]**	[0.022]*	[0.023]
(yr==1989)*D_partner	-0.002	0.001	-0.001	-0.005	0	0.004	0.034	0.02
(yr==1989)*D_partner	[0.004]	[0.006]	[0.005]	[0.006]	[0.004]	[0.005]	[0.035]	[0.036]
(yr==1990)*D_partner	0.001	-0.011	-0.006	-0.009	0	0.004	0.045	0.051
(yr==1990)*D_partner	[0.005]	[0.006]+	[0.006]	[0.006]	[0.005]	[0.006]	[0.032]	[0.036]
(yr==1991)*D_partner	0	-0.004	-0.013	-0.013	0.005	0.007	-0.017	-0.047
(yr==1991)*D_partner	[0.004]	[0.006]	[0.006]*	[0.006]*	[0.005]	[0.005]	[0.031]	[0.034]
(yr==1992)*D_partner	0.006	0.005	-0.008	-0.012	0.009	0.012	-0.001	-0.044
(yr==1992)*D_partner	[0.005]	[0.007]	[0.005]+	[0.005]*	[0.005]+	[0.006]+	[0.030]	[0.036]
(yr==1993)*D_partner	0.004	0.003	-0.012	-0.014	0.014	0.021	-0.001	-0.024
(yr==1993)*D_partner	[0.004]	[0.006]	[0.005]*	[0.005]*	[0.004]**	[0.006]**	[0.031]	[0.033]
(yr==1994)*D_partner	-0.109	-0.097	-0.022	-0.027	0.025	0.031	0.38	0.332
(yr==1994)*D_partner	[0.010]**	[0.016]**	[0.007]**	[0.007]**	[0.005]**	[0.006]**	[0.040]**	[0.041]**
(yr==1995)*D_partner	-0.143	-0.133	-0.033	-0.035	0.023	0.026	0.47	0.422
(yr==1995)*D_partner	[0.008]**	[0.008]**	[0.005]**	[0.006]**	[0.004]**	[0.005]**	[0.040]**	[0.041]**
Constant	-0.155	-0.148	-0.032	-0.037	0.029	0.033	0.465	0.402
Constant	[0.008]**	[0.008]**	[0.006]**	[0.006]**	[0.005]**	[0.005]**	[0.039]**	[0.039]**
Constant	0.228	0.2	-0.045	-0.033	0.198	0.19	0.41	0.499
Constant	[0.004]**	[0.006]**	[0.004]**	[0.002]**	[0.003]**	[0.002]**	[0.021]**	[0.006]**
Year effects	Yes	No	Yes	No	Yes	No	Yes	No
State-ind-size effects	Yes	No	Yes	No	Yes	No	Yes	No
State-ind-year effects	No	Yes	No	Yes	No	Yes	No	Yes
Observations	420200	420200	350102	350102	350024	350024	407515	407515
R-squared	0.40	0.26	0.16	0.13	0.28	0.25	0.08	0.08
Adjrsq	0.37	0.21	0.10	0.06	0.24	0.19	0.03	0.02
Numclust	1097	1097	1045	1045	1045	1045	1088	1088

Table 4b: Regression estimates of the direct effects of the tax law change: Variation of response across age and location

	Fraction of Non-Salaried Owners			Profits-to-Sales Ratio			Wage-Bill-to-Sales Ratio			White-Collar-Wage-Bill-to-Profits Ratio		
	1	2	3	1	2	3	1	2	3	1	2	3
	Full	Urban Only	Old only	Full	Urban Only	Old only	Full	Urban Only	Old only	Full	Urban Only	Old (>10yr) only
(yr==1993)*D_partner	-0.097 [0.016]**	-0.12 [0.012]**	-0.102 [0.026]**	-0.027 [0.007]**	-0.022 [0.007]**	-0.02 [0.009]*	0.031 [0.006]**	0.03 [0.007]**	0.028 [0.008]**	0.332 [0.041]**	0.355 [0.048]**	0.399 [0.058]**
(yr==1994)*D_partner	-0.133 [0.008]**	-0.148 [0.009]**	-0.15 [0.011]**	-0.035 [0.006]**	-0.03 [0.006]**	-0.025 [0.008]**	0.026 [0.005]**	0.022 [0.006]**	0.021 [0.008]**	0.422 [0.041]**	0.44 [0.048]**	0.484 [0.054]**
(yr==1995)*D_partner	-0.148 [0.008]**	-0.164 [0.008]**	-0.161 [0.011]**	-0.037 [0.006]**	-0.032 [0.006]**	-0.031 [0.008]**	0.033 [0.005]**	0.03 [0.006]**	0.034 [0.006]**	0.402 [0.039]**	0.392 [0.046]**	0.43 [0.062]**
Constant	0.2 [0.006]**	0.2 [0.005]**	0.198 [0.007]**	-0.033 [0.002]**	-0.024 [0.002]**	-0.017 [0.002]**	0.19 [0.002]**	0.189 [0.002]**	0.214 [0.002]**	0.499 [0.006]**	0.55 [0.008]**	0.564 [0.008]**
State-ind-year effects	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Observations	420200	296768	239979	350102	251318	198079	350024	251249	198008	407515	289757	230063
R-squared	0.26	0.29	0.28	0.13	0.12	0.16	0.25	0.24	0.30	0.08	0.09	0.11
Adjrsq	0.21	0.24	0.21	0.06	0.05	0.07	0.19	0.17	0.22	0.02	0.02	0.02
Numclust	1097	1019	950	1045	977	908	1045	977	908	1088	1013	941

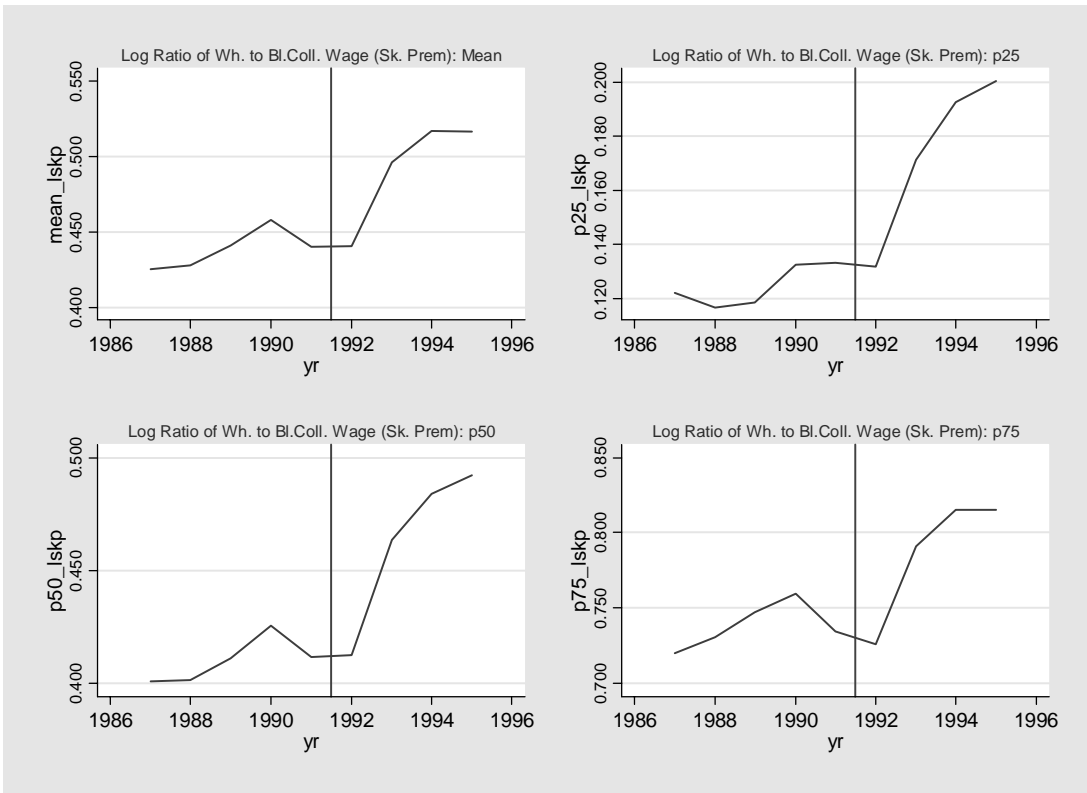


Figure 4: Trends in Mean and Percentiles of Log Skill Premium

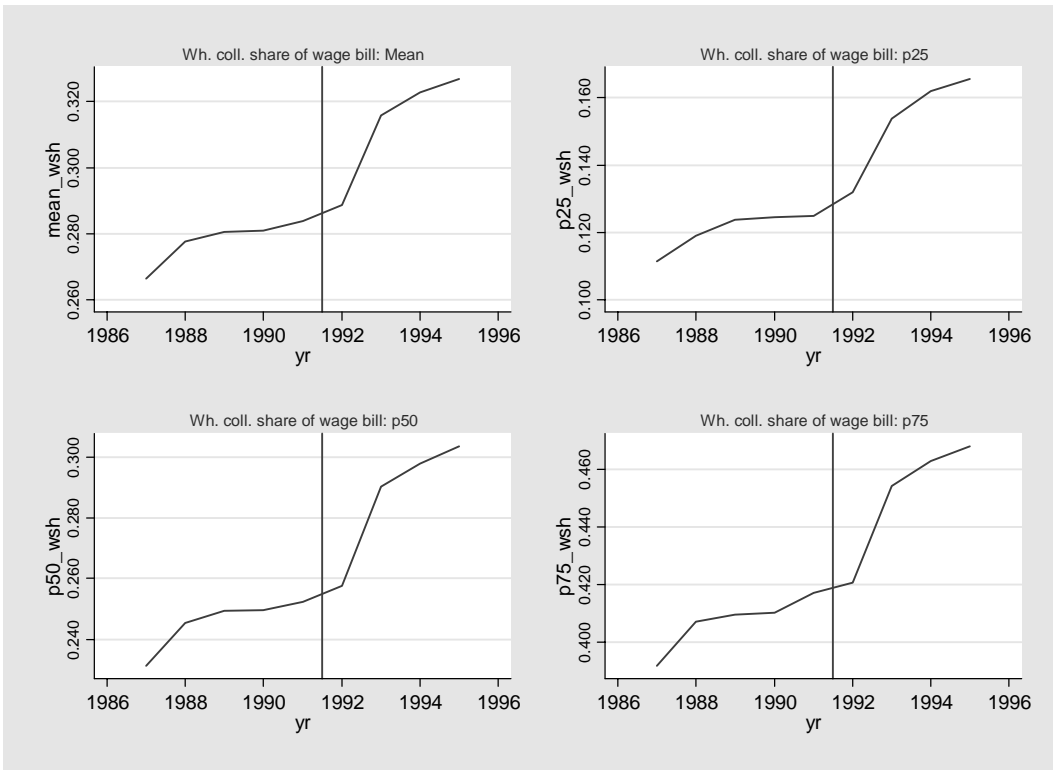


Figure 5: Trends in Mean and Percentiles of White Collar Share of Wage Bill

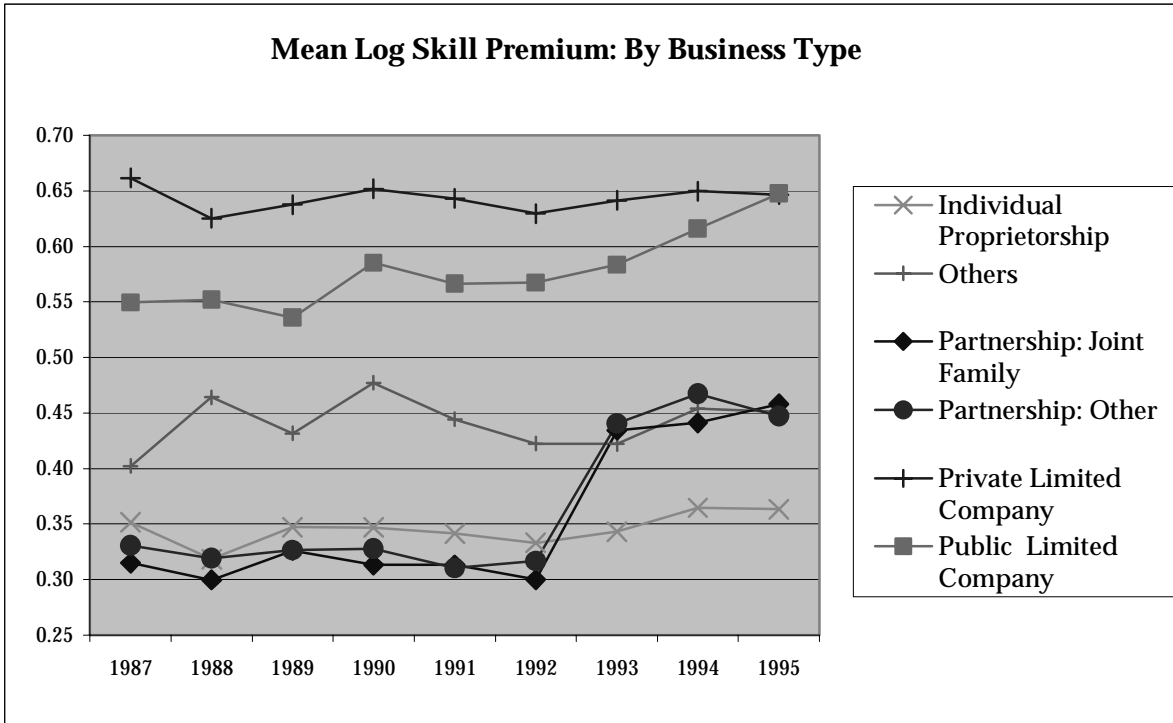


Figure 6: Mean Log Skill Premium, by Business Type

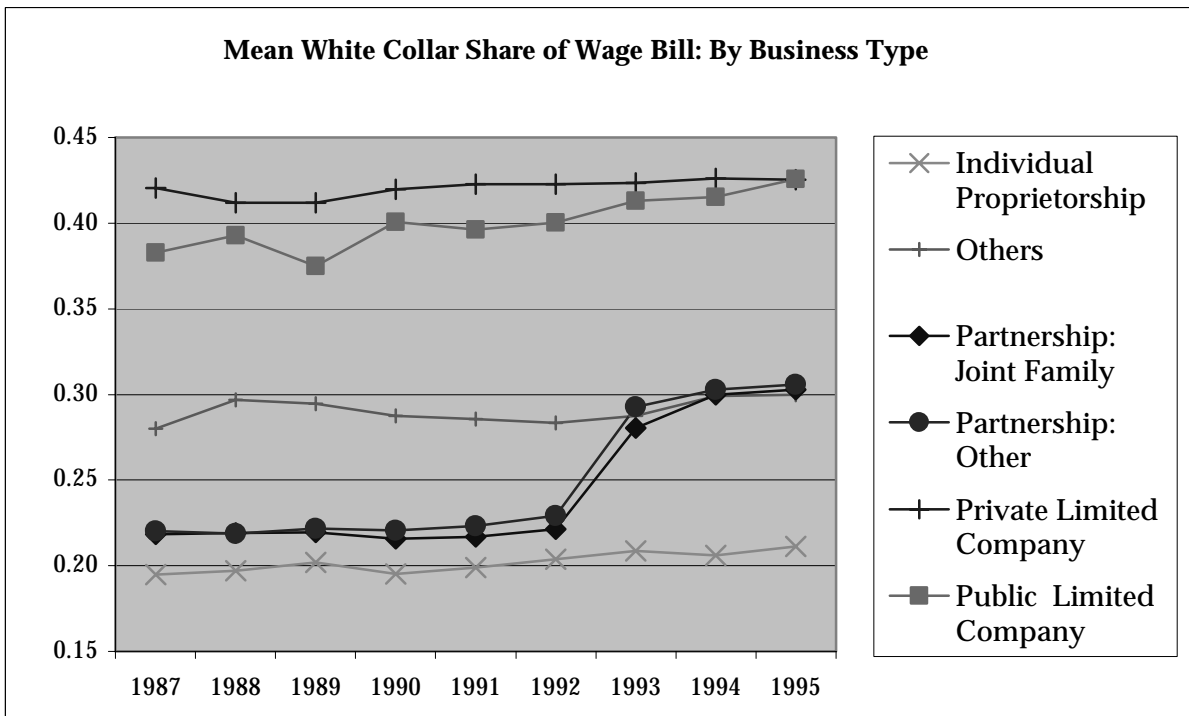


Figure 7: Mean White Collar Share of Wage Bill, by Business Type

Table 5a: Regression analysis of skill premium trends – controlling for tax law change

	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)
	log_skpr	log_skpr	log_skpr	log_skpr	wshare	wshare	wshare	wshare
yr=1988	-0.015 [0.004]**		-0.015 [0.007]*		0.179 [0.161]		0.324 [0.273]	
yr=1989	0.001 [0.005]		-0.008 [0.007]		0.189 [0.179]		0.156 [0.286]	
yr=1990	0.012 [0.006]*		0.011 [0.007]+		0.416 [0.194]*		0.421 [0.299]	
yr=1991	0.002 [0.005]		-0.002 [0.007]		0.665 [0.242]**		0.566 [0.345]	
yr=1992	-0.002 [0.006]		-0.015 [0.008]+		1.073 [0.214]**		0.735 [0.342]*	
yr=1993	0.063 [0.007]**		-0.006 [0.008]		4.349 [0.262]**		1.08 [0.336]**	
yr=1994	0.082 [0.009]**		0.011 [0.008]		4.899 [0.304]**		1.219 [0.381]**	
yr=1995	0.076 [0.007]**		0.012 [0.008]		5.257 [0.353]**		1.638 [0.448]**	
tpd=1 (1991,92)		-0.001 [0.003]		-0.007 [0.005]		0.663 [0.154]**		0.417 [0.201]*
tpd=2 (1993,94,95)		0.073 [0.005]**		0.008 [0.005]		4.63 [0.239]**		1.083 [0.233]**
D_partnership			-0.138 [0.009]**	-0.138 [0.007]**			-6.06 [0.562]**	-6.334 [0.471]**
(yr=1988)*D_partnership			0 [0.008]				-0.342 [0.303]	
(yr=1989)*D_partnership			0.011 [0.010]				-0.232 [0.297]	
(yr=1990)*D_partnership			-0.009 [0.010]				-0.491 [0.337]	
(yr=1991)*D_partnership			-0.008 [0.008]				-0.432 [0.363]	
(yr=1992)*D_partnership			0.008 [0.010]				-0.132 [0.357]	
(yr=1993)*D_partnership			0.127 [0.011]**				5.908 [0.414]**	
(yr=1994)*D_partnership			0.13 [0.012]**				6.784 [0.472]**	
(yr=1995)*D_partnership			0.114 [0.011]**				6.682 [0.494]**	
(tpd=1)*D_partnership				0.001 [0.006]				-0.01 [0.214]
(tpd=2)*D_partnership				0.123 [0.007]**				6.724 [0.339]**
Constant	0.414 [0.005]**	0.414 [0.002]**	0.488 [0.007]**	0.486 [0.004]**	26.537 [0.176]**	26.744 [0.104]**	29.884 [0.372]**	30.119 [0.238]**
Observations	385531	385531	385531	385531	421561	421561	421561	421561
R-squared	0.17	0.17	0.18	0.18	0.33	0.33	0.34	0.34
Adjrsq	0.122	0.122	0.129	0.129	0.291	0.291	0.304	0.304
Numclust	1060	1060	1060	1060	1098	1098	1098	1098

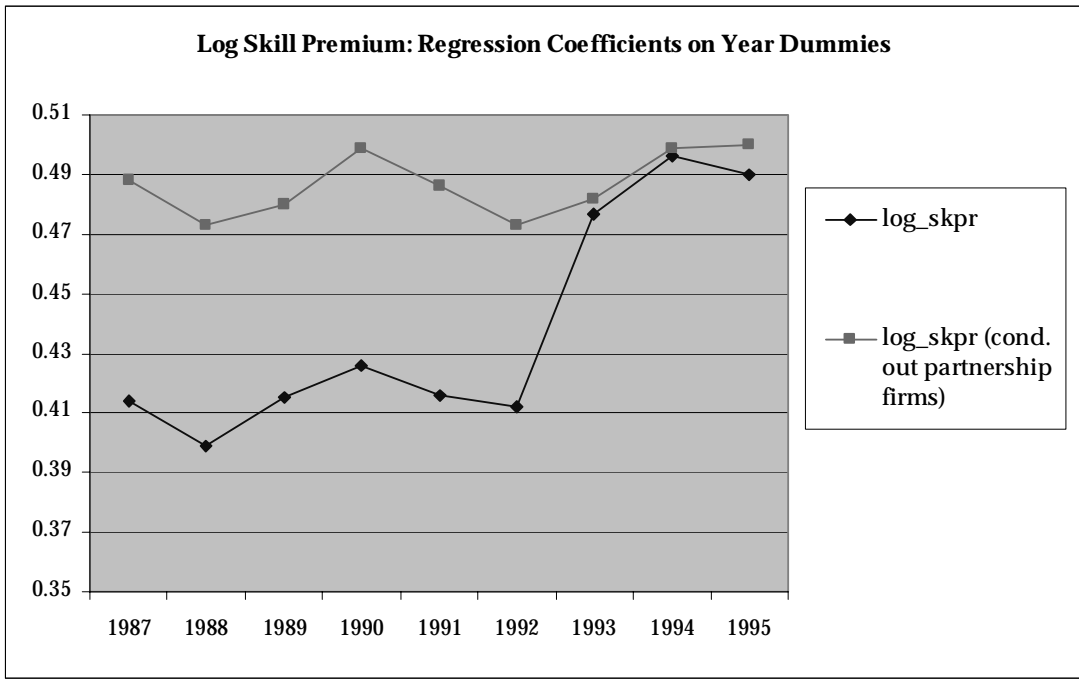


Figure 7: Coefficient on Year Dummies on Log Skill Premium from Table 4 (with and without controls for partnership firms)

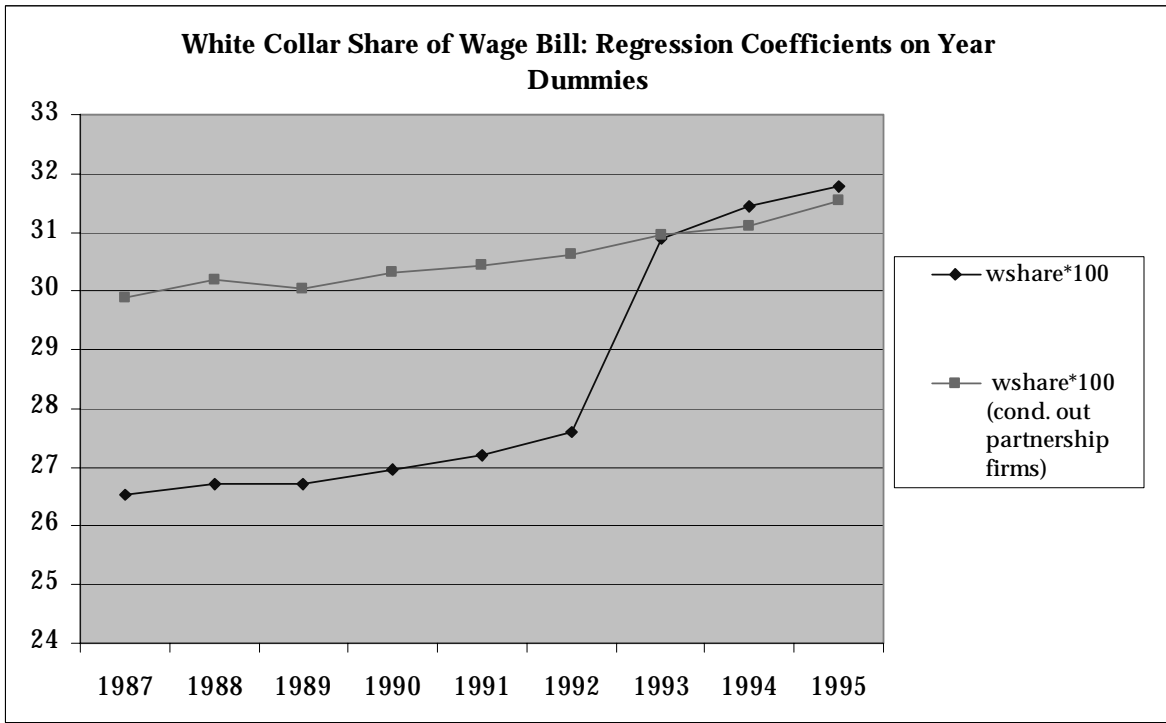


Figure 8: Coefficient on Year Dummies on White Collar Share of Employment from Table 4 (with and without controls for partnership firms)

Table 5b: Regression Analysis of Log Skill Premium – Alternative Explanations

	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)
	log_skpr	log_skpr	log_skpr	log_skpr	log_skpr	log_skpr	log_skpr	log_skpr	log_skpr
tpd=1	-0.001 [0.003]	-0.007 [0.005]	-0.005 [0.007]	-0.002 [0.003]	-0.003 [0.003]	0.001 [0.004]	-0.002 [0.003]	-0.026 [0.027]	-0.029 [0.031]
tpd=2	0.073 [0.005]**	0.008 [0.005]	0.086 [0.009]**	0.075 [0.005]**	0.074 [0.006]**	0.074 [0.006]**	0.068 [0.005]**	0.148 [0.044]**	0.011 [0.047]
D_partnership		-0.138 [0.007]**							-0.143 [0.006]**
(tpd=1)*D_partnership		0.001 [0.006]							0.002 [0.006]
(tpd=2)*D_partnership		0.123 [0.007]**							0.121 [0.007]**
(tpd=1)*fallu9092			0.012 [0.023]						0.013 [0.027]
(tpd=2)*fallu9092			-0.044 [0.034]						-0.036 [0.033]
(tpd=1)*prexrat				-0.002 [0.002]					-0.003 [0.003]
(tpd=2)*prexrat				-0.006 [0.006]					-0.004 [0.005]
(tpd=1)*primrat					0.004 [0.015]				0.019 [0.017]
(tpd=2)*primrat					0.002 [0.014]				0.034 [0.012]**
(tpd=1)*fdi						-0.007 [0.007]			-0.009 [0.007]
(tpd=2)*fdi						-0.007 [0.008]			-0.006 [0.008]
cap_out							0.008 [0.001]**		0.009 [0.001]**
(tpd=1)*cap_out							-0.001 [0.002]		-0.001 [0.002]
(tpd=2)*cap_out							0.001 [0.002]		-0.002 [0.002]
(tpd=1)*dist_fr								0.035 [0.040]	0.022 [0.043]
(tpd=2)*dist_fr								-0.109 [0.064]+	0.006 [0.064]
Constant	0.414 [0.002]**	0.486 [0.004]**	0.421 [0.002]**	0.421 [0.002]**	0.421 [0.002]**	0.422 [0.002]**	0.417 [0.002]**	0.407 [0.002]**	0.498 [0.004]**
Observations	385531	385531	354524	359722	359722	385531	325510	364722	300598
R-squared	0.17	0.18	0.16	0.17	0.17	0.17	0.18	0.17	0.18
Adjrsq	0.122	0.129	0.121	0.121	0.121	0.122	0.127	0.121	0.135
Numclust	1060	1060	397	467	467	1060	966	478	394

Table 5c: Regression Analysis of White Collar Share of Wages – Alternative Explanations

	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)
	wshare	wshare	wshare	wshare	wshare	wshare	wshare	wshare	wshare
tpd==1	0.663 [0.154]**	0.417 [0.201]*	0.25 [0.308]	0.608 [0.148]**	0.531 [0.159]**	0.599 [0.187]**	0.46 [0.156]**	-0.38 [1.356]	-1.229 [1.479]
tpd==2	4.63 [0.239]**	1.083 [0.233]**	4.474 [0.462]**	4.73 [0.228]**	4.526 [0.282]**	4.492 [0.310]**	4.039 [0.285]**	10.221 [2.621]**	0.55 [3.069]
D_partnership		-6.334 [0.471]**							-6.584 [0.448]**
(tpd==1)*D_partnership		-0.01 [0.214]							0.13 [0.204]
(tpd==2)*D_partnership		6.724 [0.339]**							6.467 [0.361]**
(tpd==1)*fallu9092			1.285 [0.856]						1.367 [0.938]
(tpd==2)*fallu9092			0.715 [1.744]						2.513 [1.844]
(tpd==1)*prexrat				-0.002 [0.038]					0.017 [0.046]
(tpd==2)*prexrat				-0.338 [0.275]					-0.164 [0.170]
(tpd==1)*primrat					0.701 [0.573]				0.122 [0.625]
(tpd==2)*primrat					1.345 [1.001]				1.386 [0.969]
(tpd==1)*fdi						0.247 [0.305]			0.459 [0.293]
(tpd==2)*fdi						0.526 [0.413]			0.976 [0.425]*
cap_out							0.798 [0.084]**		0.852 [0.057]**
(tpd==1)*cap_out							0.044 [0.062]		0.098 [0.063]
(tpd==2)*cap_out							0.346 [0.062]**		0.245 [0.070]**
(tpd==1)*dist_fr								1.464 [1.949]	1.063 [2.086]
(tpd==2)*dist_fr								-8.075 [3.752]*	-1.386 [4.264]
Constant	26.744 [0.104]**	30.119 [0.238]**	26.31 [0.102]**	26.703 [0.102]**	26.699 [0.102]**	26.742 [0.103]**	26.751 [0.129]**	26.648 [0.100]**	30.193 [0.199]**
Observations	421561	421561	388270	394162	394162	421561	355710	399328	328979
R-squared	0.33	0.34	0.33	0.33	0.33	0.33	0.36	0.33	0.36
Adjrsq	0.291	0.304	0.295	0.295	0.295	0.291	0.313	0.294	0.328
Numclust	1098	1098	397	467	467	1098	986	478	394