POVERTY ASSESSMENT
Social Protection Chapter
Background paper 3

Compulsory Social Security Participation Revealed preferences

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Since 1947, the Vietnam Social Security has provided social insurance to public servants and armed forces personnel in Vietnam. In 1995, the Government merged the social insurance unit of the Ministry of Labour, Invalids and Social Affairs with that of the Vietnam General Confederation of Labor. At the same time the system became mandatory to the employees of the newly developing private sector. The consolidated system is publicly managed by the Vietnamese Social Security administration (VSS) that collects contributions and pay social insurance benefits (in case of sickness and sick leaves, maternity and family planning related leaves, work injury and professional disease, survivorship and to people that reached pension ages). The mandatory coverage[2] of the private sector was first restricted to the enterprises with 10 or more employees. Since 2005, all the types of enterprises, whatever their size, have the obligation to register to VSS the employees with a labor contract of 3 months or longer.

In recent years, participation to VSS has been increasing fast along the development of the private sector. The number of contributors (public and private employees) of 3 231 thousand persons in 1996 increased to 6 971 thousand persons in 2007. While private employees represented only 4% of the contributors in 1995, they represented 44% of the total contributors in 2007. Still, the number of contributors if compared to the number of people reporting being employed in Vietnam is relatively small. It covers 38.8% of the 17 464 thousand persons that report receiving wages equal or above the legal minimum wage[3]. The reasons for this low coverage are unknown. It could be that these persons are not employed under a labor contract or that their employers are not well aware of their social obligations. It could be also that employers avoid register (with or without employees implicit agreement) to obtain higher enterprises revenues or to pay higher employee's net wages.

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[2] Since 2006, self-employed and farmers can participate in a voluntary publicly managed pension fund. Participation to health insurance is also possible since 2005.
[3] See companion paper

Determining the reasons that explain in Vietnam the low coverage of social security has direct policy implications. If employees are not aware of their legal rights or employers simply do not respect the law, law enforcements and public campaign should have a positive impact on coverage. However, if through avoidance, employees obtain higher net wages, these policies could fail. Employees as well as employers could resist the changes.

This paper investigates these issues. It uses the information of the Census of enterprises of 2006. This database includes 129 566 enterprises from the public (2.6%), the private sector (94.2%) and the foreign invested sector (3.2%). It is expected to cover, therefore, most of the employees that should be according to the law registered to the Vietnam Social Security with the exception of the employees of the public administration and some minor groups such as the student enrolled in overseas institutions. However, because the private sector in Vietnam includes many households units which inventory is difficult to make, the Census of enterprises of 2006 is likely not exhaustive of all the small enterprises in Vietnam. According to the Census of enterprises the total number of employees in state owned and private enterprises in Vietnam in 2005 was equal to 6,038,456. That number in the household survey of 2006 was equal to 17,460,658[4].

The study starts with a classification of the enterprises depending on their participation to the Vietnam Social Security. Among the enterprises that contribute, one striking feature is that on average the share in the wage bill of the contributions paid to the Vietnam Social Security is much lower than the contribution rate established in the law. Even if the enterprises that do not register their employees are excluded from the calculation, the average ratio is of 7.6% while the legal rate was in 2006 equal to 23%. The study, consequently, examine this issue before investigating the characteristics of the enterprises that do not register their employees. The paper shows that this low ratio is due to a wide practice by enterprises of paying contributions on lower wages than current wages. The paper investigates, furthermore, who benefit from the practice of avoiding registration and from the practice of under-reporting wages to social security. The results indicate strong evidence that employees in enterprises that are not registered to social security and in enterprises that under report wage receive higher net wages. Evidences about enterprises' higher revenues per worker are not strong. The last section discusses the implications of these findings regarding future trends in coverage and social security policies toward low income. They argue that the wide spread practice of under reporting wages to social security will increasingly erode public appreciation of the insurance role of social security in reducing income shocks. This, in turn, will reassure employers and employees about the appropriateness of their behavior regarding evasion and/or under reporting wages. This section also argues that the practice of under reporting wages leads that the system guarantees the minimum pension to many retirees that are not low income earners. This policy leakage is unfair and costly. Both consequences raise concerns about the system's capacity to increase coverage and financially sustainability in the long-term.

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[4] See companion paper

1. Registering employees to the Vietnam Social Security

Table 1 reports the participation rate of enterprises and employees to the Vietnam Social Security that is the percentage of firms that contribute to the Vietnam Social Security in the total number of firms. The results show that among the 129 566 surveyed enterprises only 59 346 firms (45.8%) contributed to the Vietnam Social Security. As expected the rate of participation of the state owned enterprise is very high (95.4%) with average size of 496 employees. Since it is rather difficult to believe that in Vietnam some public owned enterprises could not comply with the law, the 4.6% of non participation is likely due to reporting errors.

By contrast the participation rate of the enterprises of the enterprise of the private sector is low (83.1% in the case of the FDI enterprises with average size of 362 workers and 43.2% for the others with average size of 38 employees). Only the enterprises with some public capital show a high participation rate (92.8%).

Table 1 Enterprises Participation Rates to the Vietnam Social Security			
	Total	Contributing to VSS	Participation Rate (%)
Total	**129566**	**59346**	**45.8**
Public	**3378**	**3222**	**95.4**
Central State Enterprises	934	920	98.5
Local State Enterprises	1309	1289	98.5
Joint Stock with Public Capital (>50%)	1135	1013	89.3
Private	**122025**	**52667**	**43.2**
Collective	6220	2771	44.5
Private	36805	9840	26.7
Collective name	32	15	46.9
Private Limited Companies	62847	31173	49.6
Joint Stock with Public Capital	1320	1225	92.8
Joint Stock no Public Capital	14801	7643	51.6
Foreign Investment	**4162**	**3457**	**83.1**
100% foreign	3289	2727	82.9
Joint venture	873	730	83.6

Sources: Author's calculation based on the Census

2. Share of Vietnam Social Security contributions in total wages

Among the enterprises that contribute, one striking feature is that on average the share of the contributions paid by enterprises to the Vietnam Social Security in the wage bill (the sum wages payments) is much lower than the contribution rate established in the law. As it is shown in Box 1, this ratio should be according to the law equal to 23%. The figures in Table 3 indicate that it is in reality far below and equal in average to 7.6%.

Box 1: Vietnam Social Security Contribution Rates

Social contributions are paid to three funds: the pension and survivorship fund, the social security fund that regroups the sickness, maternity, family planning, work injury and professional disease benefits and the health insurance fund. The structure of the contribution rates applied in 2005 on the wages reported in the Enterprise Census is described in Table 2.

Table 2 Contributions rates			
Type of benefits[b]	Employers	Employees	Total
Old age and survivorship	10	5[a]	15
Sickness, maternity and family planning leaves[c]	4[d]		4
Work injury and professional disease[c]	1		1
Health insurance [e]	2	1	3[f]
Total	17	6	23

Note: (a) Increased to 6% in 2007; starting 2010 to be increased by 2 p.p. every 2 years until it reaches 12% starting this rate is increased by 1% every year until it reaches 8% (b) the Social Security Law of 2006 foresees the introduction of unemployment benefit in the future (c) Contribution rates merged in only one category before the Social Security Law of 2006 (d) Reduced to 3% in the Social Security Law of 2006 of which 2 p.p. is kept in the enterprise in reserves (e) the functioning of health insurance is described in a specific law; (f) under the Health insurance law of 2008, possibly increased up to 6% depending on the financing needs.

These rates are defined on net wages that is on the amount employees take home after the social contributions are deduced.

Although the law distinguishes the portion paid by the employees from the portion paid by the employers, employers are responsible for the overall payment of the contributions due. Accordingly, the amount of contributions reported in the Enterprise Census should be equal to 23% of the total amount of wages paid by the enterprises.

Starting 2007, the contribution rate has been increased to 24% but enterprises are authorized to keep part of the contributions (2 p.p.) in reserves to be able to pay employee's social security short-term benefits in case of sickness, maternity an family planning related leaves. The share of the contributions in total wages will, consequently, be reduced to 22%.

Surprisingly, the share of contributions in total wages is abnormally low in the public sector (7.6%) as well as in the private sector (9.5 % in the case of enterprises with FDI and 5.9% in the others). Part of the explanation is likely that some enterprises transferred to the Vietnam Social Security only a portion of the contributions due because of financial difficulties or occasionally in order to avoid a delay in the payment of the social

security benefits to the employees that are in sick or maternity leave[5]. These events, by themselves, cannot explain, however, that a majority of enterprises contribute very low shares of the wages to the Vietnam Social Security as Figures 1 and 2 show below.

	Amount of Contributions paid to VSS (billion VND) (C)	Employees total remunerations[a] (billion VND) (Wb)	Contribution Shares (%) (shC)
Table 3			
Share of Contributions in Total Wages			
Average by ownership			
Total	**8943**	**118412**	**7.6**
Public	**3631**	**48057**	**7.6**
Central State Enterprises	1950	29435	6.6
Local State Enterprises	817	8391	9.7
Joint Stock with Public Capital (>50%)	863	10770	8.0
Private	**2254**	**38247**	**5.9**
Collective	41	920	4.5
Private	104	2559	4.1
Collective name	0.5	8	6.3
Private Limited Companies	891	18579	4.8
Joint Stock with Public Capital (<50%)	644	7779	8.3
Joint Stock no Public Capital	573	8380	6.8
Foreign Investment	**3058**	**32108**	**9.5**
100% foreign	2374	24349	9.7
Joint venture	658	7757	8.5

Sources: Author's calculation based on the Census
Notes: (a)in some enterprises, the study assumes that all employees are not registered to the Vietnam Social Security. More details are provided in annex 1.

Figure 1 shows more than half of the enterprises (66.93%) contribute as less as an amount lower than 5% of the wages they pay. Only a very few number (3.47 %) of the enterprises contribute effectively 23%, in which only 1.8% of the firms have higher 23% share.

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[5] As it is mentioned in Box 2, the law of 2006 foresees the retention of part of the contributions by the enterprise. We do not know, however, if a similar practice was authorized before. In any case, it would explain a much lower reduction of the observed share of the contributions in wages that the one that is effectively observed.

Figure 1: Observed share of contributions in total wages:
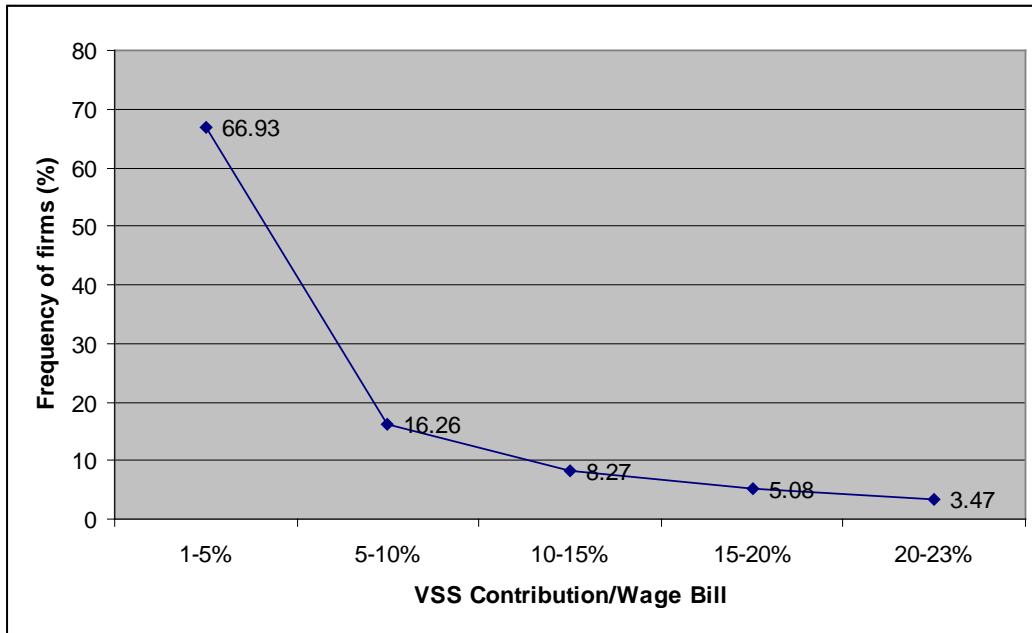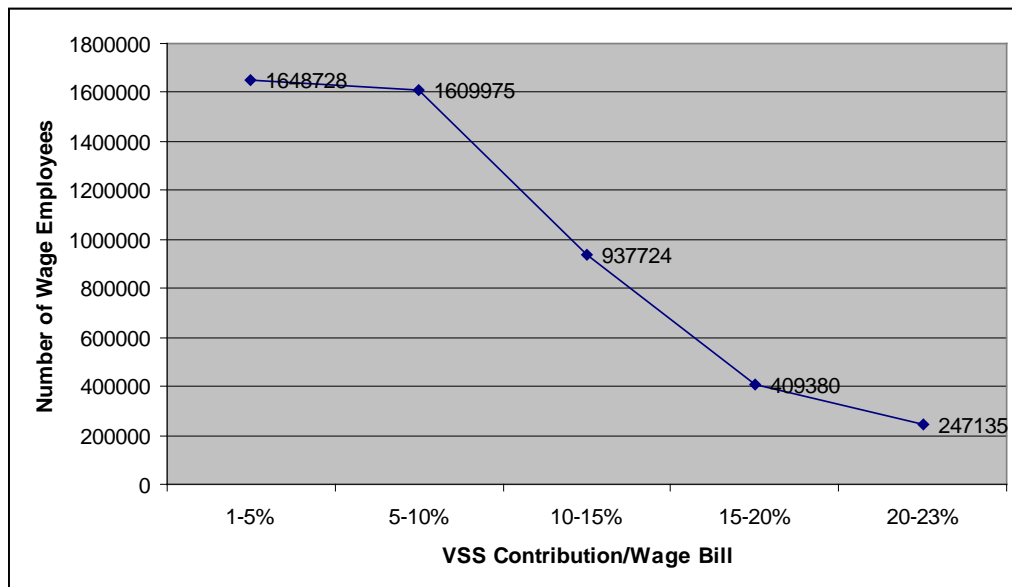**Number of enterprises by levels**

Figure 2 shows the numbers of employees that are affected by such a behavior. The results are as well alarming: about 3.2 millions persons are employed in enterprises in which the share of the contributions represents less than 10% of the wages.

Figure 2: Observed share of contributions in total wages:
Number of employees by levels

This situation means that enterprises either do not register all their employees to the Vietnam Social Security or do not report all the wages they effectively pay their employees (or both). Both situations are possible in Vietnam. First, short-term employees with labor contracts shorter than for 3 months are not registered to the Vietnam Social Security. Second, contributions are not calculated on the total amount of wage costs that enterprises report to the Tax authorities but on the wages that are reported in employees' labor books that is on the wages that were determined at the time the labor contracts were signed. These amounts are usually not revised when employees' wages are increased. As a result, the relative size of the wage reported in the labor book diminishes overtime in relation to the current wages effectively received by employees. Hence, the share of the contributions paid to the Vietnam Social Security in current wages tends also to decline overtime until the level of the wage reported in the labor book hits the level of the legal minimum wage. Figures 3 and 4 give an illustration of that process.

Figure 3: Illustration of the falling share of labor books' wages in relation to current wages

Figure 4: Illustration of the falling share of contributions in current wages
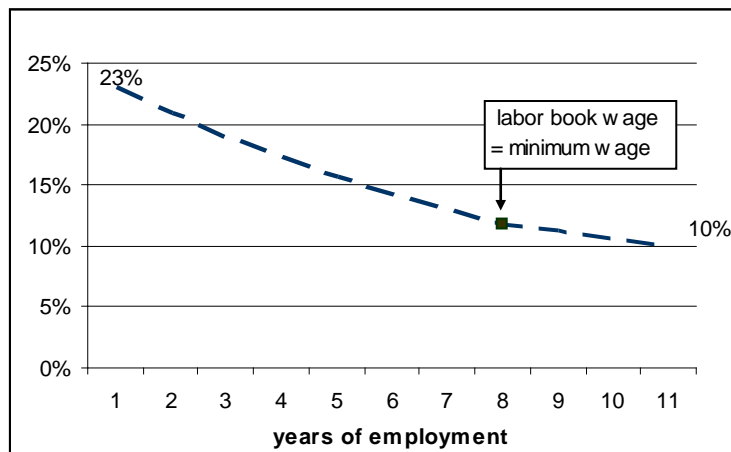
Figure 3 shows the increasing gap between the current wage and the wage reported in the labor book as one moves away from the date the labor contract was signed. The wage in the labor contract is not revised until its level reaches the level of the legal minimum wage that is the bottom wage on which contributions can be paid (in year 8 in Figure 3). As a result in Figure 4, the share of the contributions in current wages steadily falls from 23% in year 1 (when the labor contract is signed) to 10% in year 11. The fall is slowed after the wage in the labor book reached the level of the minimum wage and increases afterward at the same speed

The following section evaluates the importance of these two factors.

3. Register of employees and report of wages to the Vietnam Social Security

Two approaches help estimate the relative share of short-term employed not registered to the Vietnam Social Security. The first is based on the obligation to contribute at least 23% of the minimum wage per worker. The second compares the number of employees working in the enterprises of the Enterprise Census to the number of employees officially registered to the Vietnam Social Security. The combine results indicate that short-term employees represent roughly 18.2% (882,351 persons) of the enterprises total employment (the total does not include the employees of the enterprises that did not contribute at all to the Vietnam Social Security).

Legally, the minimum level of contribution per worker must be equal to 23% of the minimum wage over the year. Some enterprises in the Enterprise Census report lower levels. One possibility is that these enterprises hire part-time workers, but in Vietnam such a practice is rare. Another possibility is that part of the employees were hired or fired during the year. Since only the employees with some long commitments with enterprises are likely to be registered to the Vietnam Social Security, the study assumes that these workers who have been hired or fired during the year are not registered. Accordingly, the number of the employees these enterprises report to the Vietnam Social Security is the number so that the average contribution per employee is equal to 23% of the minimum wage in the year.

Let's assume that N is the total number of employees reported by the enterprises, B the total amount of wage and C the level of contributions. If w is the minimum wage, the average contribution per worker should be higher or equal to 23% of the minimum wage (equation 1). If this condition is not verified, then the number of employees registered to the Vietnam Social Security N* is given by the equation (2).

(1) $\dfrac{C}{N} \geq 0.23 * w$

(2) If $\dfrac{C}{N} < 0.23.w$ then $N^* = \dfrac{C}{0.23.w}$

Based on the information presented in Table 4, it appears that 65.9% enterprises (mostly from the private enterprises with 72%) do not verify (1).

Table 4
Level of the minimum wage in Vietnam in 2005 in thousand VND

Period	Domestic	FDI region 1	FDI region 2	FDI region 3
65.9Jan-Sept	290	626	556	487
Oct-Dec	350	626	556	487
Yearly average	305	626	556	487

Note:
Region 1 includes FDI enterprises in the urban districts of Hanoi and Ho Chi Minh City. Region 2 includes FDI enterprises in the suburban districts of Hanoi and Ho Chi Minh City and the urban districts of Haiphong, Halong (Quang Ninh province), Bien Hoa(Dong Nai province), Long Khanh, Nhon Trach, Long Thanh, Vinh Cuu and Trang Bom (Dong Nai province) Thu Dau Mot, Thuan An, Di An, Ben Cat and Tan Uyen (Binh Duong) Vung Tau (Ba Ria - Vung Tau province). Region 3: includes all the other areas

In these enterprises, the average contribution per worker is lower than 23% of the average wage in a year. Accordingly, the number of employees registered by these enterprises to the Vietnam Social Security was adjusted so that the reported amount of contribution per registered worker is equal to 23 % of the minimum wage in the year.

As the figures in Table 5 indicate, the correction reduce the number of employees likely registered to the Vietnam Social Security from 4 852 942 to 3 970 591. According to this estimate about 882 351 employees were likely to be short-term employees.

Table 5
Estimate of employees under short-term contract (1)

1. Total number of employees	
Enterprise sector	4852942
+ State sector	1598796
+ Private sector	2001894
+ FDI	1252252
2. Total number of employees likely registered	
Enterprise sector	3970591
+ State sector	1451039
+ Private sector	1416344
+ FDI	1103208
3. Total number of employees likely hired under short-term contracts	
Enterprise sector	882351
+ State sector	147757
+ Private sector	585550
+ FDI	149044

The second approach compares the number of workers likely registered to the Vietnam Social Security obtained in Table 5 to the official number of contributors. The Vietnam Social Security provides figures of employees' registration by ownership. However, it does not distinguish, in the public sector, the employees in the enterprise sector from the employees in the administration[6]. So, in Table 6, the number of the employees in the administration is obtained from Ministry of Labor and Social Affairs. It corresponds to the total of number of persons employed in the sectors of education, training and health, health and social work, activities of the Party and membership organization. Since the figures of the Ministry of Labor and Social Affairs do not differentiate employment by sector and ownership, the figure reported in Table 4 over-estimates the number of the public employees in the administration[7]. Based on this estimate, the number of employees working in the sector enterprise and registered to the Vietnam Social Security is estimated to be equal to 3 742 119. An additional number of 228 472 persons would be short-term employed.

Table 6 Estimate of employees under short-term contract (2)	
1. Total number of employees likely registered [a]	3970591
1.1. Private sector	1416344
1.2. FDI	1103208
1.3. State sector	1451039
2. Total number of employees officially registered [b]	6226991
2.1 Central Government, Army, Finance, Education etc.[c]	2484872
2.2 Enterprise sector = (2) - (2.1.)	3742119
2.2.1. Private sector	1374261
2.2.2. FDI	1124566
2.2.3. State sector = (2.2) - (2.2.1) - (2.2.2.)	1291915
3. Additional number of employees likely hired under short-term contracts	
3.1 Enterprise sector	228472

Sources: (a) Enterprise Census (b) Vietnam Social Security (c) Ministry of Labor and Social Affairs.

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If we combined the two approaches, about 1 110 823 employees (= 882351+228472) or 22.9% of the employees the enterprises of the formal sector are not registered to the Vietnam Social Security, more likely because they are hired on short-term contracts.

Based on the estimate of the number of employees hired under short-term contracts and therefore not registered to the Vietnam Social Security it is possible to estimate the

[6] As a result, there is a difference in sum of contributions from the Census (8,943 billion VND) and sum of contribution from VSS data (14,483 billion VND).

[7] Because these sectors are largely dominated by the public sector, the error is expected to be relatively small.

relative size of the gap between the reported and the current wages. The results are presented in Table 7 in which the numbers of employees registered by ownership correspond to the number reported in the second section of Table 6. Unfortunately, it is not possible to take into account that the average wage of these workers is possibly lower than the wages of the registered workers. They indicate that on average reported wages represent less than half of the current wages (42.6%). By ownership, the gap is the largest among the private enterprises (reported wage represent only 37.3% of current wages).

Table 7	
Estimate of the gap between reported and current wages	
1. Total reported contributions (billion VND)	
Enterprise sector	8943
+ State sector	3631
+ Private sector	2254
+ FDI	3058
2. Estimated number of employees registered to Vietnam Social Security	
Enterprise sector	3742119
+ State sector	1291915
+ Private sector	1374261
+ FDI	1124566
3. Average reported wage (thousand VND)	
Enterprise sector	866
+ State sector	1018
+ Private sector	594
+ FDI	985
4. Average current wage (thousand VND)	
Enterprise sector	2033
+ State sector	2505
+ Private sector	1592
+ FDI	2137
5 Share of the reported wage in current wage (%)	
Enterprise sector	42.6
+ State sector	40.6
+ Private sector	37.3
+ FDI	46.1

Figure 3 and 4 show that about 42% of the enterprises, covering about 40% of overall workers, reported only 20-40% employee wages to VSS. In addition, roughly 33% of total firms, covering about 16% of the labor force in the enterprise sector, have the wage under-reporting level even less than 20%. Meanwhile, only 7% enterprises with 10% overall workers reported more than 80% employees' wages to VSS.

Figure 5: Percentage of enterprises by observed share of reported wage on current wages

Percentage of Enterprises (%)

- 33.08 (0-20%)
- 41.93 (20-40%)
- 11.66 (40-60%)
- 6.06 (60-80%)
- 7.26 (80-100%)

Observed share of reported wage on current wages

Figure 6: Percentage of total employees by observed share of reported wages on current wages

Percentage of Total Employees (%)

- 15.6 (0-20%)
- 39.8 (20-40%)
- 24.4 (40-60%)
- 10.7 (60-80%)
- 9.5 (80-100%)

Observed share of reported wage on current wages
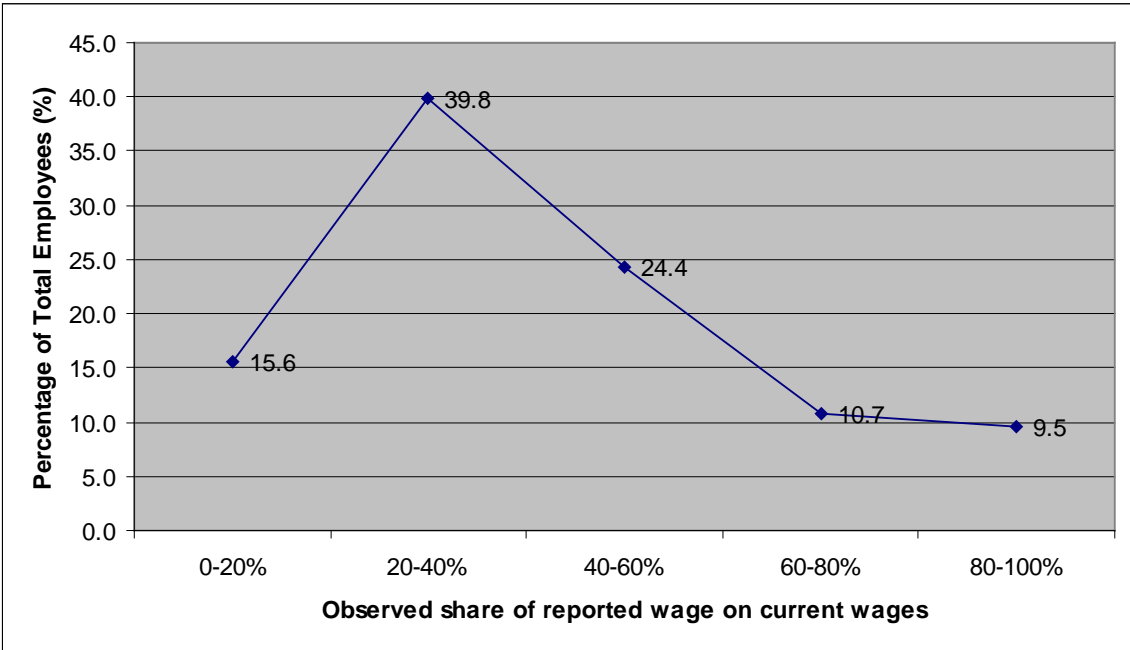
4. Enterprises and employees revealed preferences

The analysis in the previous section indicate that of the xxx enterprises that are surveyed in the Enterprises Census, x% do not register their employees to the Vietnam Social Security, and x% do register them but report wages much lower than the current wages they pay. These behaviors clearly undermine the main objective of social insurance programs that is to reduce the income shock due to the incapacity to work. If employees are not covered, employees are not insured. But, even, when insured, the levels of the Vietnam Social Security benefits are insignificant in relation to the income shock the employees could face. X% of the employees are not covered, and x% of the employees insured income levels that represent less than half of their current wage.

This lack of coverage does not seem consistent with the idea that social insurance is beneficial to employees. At a first glance, the causes look institutional: the lack of coverage is due to the size of the labor force employed under short-term contract and, the miss-interpretation by the enterprises and the Vietnam Social Security officers that contributions are only paid on the wages reported in the labor book. These factors certainly play a part, but they are satisfactory to explain that if social insurance is beneficial, the lack of coverage is so widespread. A second group of explanations point out that workers are not aware of their social rights and enterprises take advantage of these circumstances to avoid paying social taxes and increase enterprise's revenues. Public information campaign and measures strengthening law enforcement in that case would help increase coverage. The impact of these policies could be, however, quite deceiving if the causes are related to enterprises and employees' economic behaviors. By avoiding the payment or reducing the amount of contributions, enterprises can increase their revenues but employees also can take higher net wages home.

Let's assume that an enterprise hire a worker at the period t. The employees' net wage reported in the labor book is 100 and at the period t the enterprise contributes 23 to the Vietnam Social Security. The overall labor cost (or the gross wage) is 123. The employer possibly receives some capital income (from the capital invested in the enterprise and, some labor income (for the managerial activities)

Let's assume that in period t+1 the enterprise's labor productivity increased by 20%. Under such a circumstance, all the labor income in the enterprise can increase by the same amount. Several scenarios are possible. They are described in Table 8:

Because the enterprise labor productivity increased by 20%, the enterprise is able to bear an increase of its labor cost by 20% from 123 to 147.6. If contributions were paid on current wages (like in the first scenario) the enterprises would increase both the net wage and the amount of contributions by 20%. In practice, the level of the contributions remains unchanged. The surplus (4.6= 27.6-23.0) is possibly captured by the enterprise (scenario 2), paid to the employees through higher net wages (scenario 3) or shared (scenario 4).

Table 8				
Scenario	Labor cost Gross wage	Social contributions	Net wage taken home	Employer's extra revenue
0. Initial period	123	23	100.0	0
1. No evasion	147.6	27.6	120.0	0
2. Employer's capture	147.6	23	120.0	4.6
3. Employee's higher net wage	147.6	23	124.6	0
4. Sharing	147.6	23	122.3	2.3

The scenarios 2 and 4 are, in theory, possible only in the short and the medium terms. Under perfect competition and labor market mobility, employees will move to the enterprises that provide them the highest net wages, like in the scenario 2. As L. Summers (1989) explains, employees will not be willing to work in enterprises that pay contribution if the Social Security mandated benefits are worthless to them. In the example, above, employees will move to the enterprises that pay contributions on current wages (scenario 1) only if employees valuation of the Vietnam Social Security *additional* benefits worth the amount of *additional* contributions the enterprise will deduce from their net wage (in the example 4.6).

If the scenario 3 is more likely than the scenario 2 or 4, public information campaign will have little impact on coverage and any law enforcement policy risks to be very unpopular among employees.

The econometric analysis presented below search to understand from the pattern of the participation, reporting wage and the revenues of the enterprise how much the low coverage observed in Vietnam is due to institutional factors, lack of knowledge or low valuation of the benefits from social insurance.

The model reposes on the hypothesis that if all the enterprises registered their employees to the Vietnam Social Security and paid contributions on current wages the variances of the average wage per enterprise and the variance of the average enterprise's revenue would not be as large as it is effectively observed. So, the relative levels of net wages and enterprise revenue per employees in a same branch (or industry) reflect the behavior of the employees and the enterprises toward the Vietnam Social Security. Under perfect competition, enterprises in a same branch face about the same labor unit costs. All the employees do not necessarily take home, however, the same net wage. Enterprises that do not register their employees to social security pay can pay the highest net wages. Enterprises that do register their employees but don't pay contribution on current wages, pay lower net wages than the enterprises that totally avoid registration but they can pay higher wages than the enterprises that contribute on current wages.

As time passes and the reported and the current wages diverge, employees that work in the enterprises that do not contribute on current wages should be able to take home

relatively higher wages than the workers who are employed in enterprises recently established. The model expects therefore a negative relationship between the relative wages of the enterprise i in the branch j and the ratio reported wages on current wages of that enterprise.

The second situation is that enterprises' avoidance benefits enterprises instead of the workers. If workers are not aware of their social rights or desire participate to social security but are in some way excluded from the sector of the enterprises that pay contribution on current wages, the association in (1) is not observed. These employees are paid net wages as low as in the formal sector and enterprises capture the unpaid contributions. In that context, enterprises that do not register employees or do not pay contributions on current wages are expected to report higher revenues per worker than the other enterprises of the same branch. The model expects therefore a negative relationship between the relative size of enterprises' revenues per worker per branch and the ratio reported wages on current wages of that enterprise.

Other enterprises' characteristics, $X_{i,n}$, such as the share of women employees, the location, the size of the enterprise and the type of ownership probably affect employees and enterprises behavior in relation to social security. They are included in the estimation.

The study, accordingly, estimate the two following relationships:

$$(3)\ W_{i,j} = a_1 \cdot \left(\frac{W_{SSi}}{W_i} \right) + \sum b_{1,n} . X_{i,n}$$

$$(4)\ \left(\frac{R}{E} \right)_{i,j} = a_2 \cdot \left(\frac{W_{SS}}{W_i} \right) + \sum b_{2,n} . X_{i,n}$$

where W_{ssi} / W_i is the ratio between the reported and the current average wages of the enterprise i and, $(R/E)_i$ is the level of the average revenues per worker of the enterprise i of the branch j. The coefficients c_1 and c_2 are expected to be negative if avoiding employees and enterprises obtain higher net wages and higher revenues per worker than the other enterprises in the same branch, respectively. The estimation, accordingly, is done using random fixed-effects. The results are presented in Table 9.

The study uses also a multinomial logistic regression to verify if enterprises that evade social security registration report higher net wages or revenues per workers that the enterprise that do register but do not pay contributions on current wages and that these enterprises report higher net wages or revenues per workers that the enterprise that do pay contributions on current wages.

The model, therefore, classifies the enterprises in 3 groups. The first group, G1, includes the enterprises that do not register their employees. The second group, G2, includes the enterprises that do register their employees but do not pay contributions on current wages. The third group, G3, includes the enterprises that do register their employees and

contribute on current wages[8]. The model expects within a branch that the relative size of the net wages and the revenues per worker is higher in the group 1 in relation to the group 2 and higher in the group 2 in relation to the group 3.

The results are presented in Table 10. In this table, the groups 2 and 3 have been divided in two groups, 4 and 5 that include the enterprises that appear to report only a portion of their employees and most likely pay contributions on the minimum wage. The group 2 includes the enterprises in which the current average wage is higher than the minimum wage. The group 3 includes the enterprises in which the current average wage is lower than the minimum wage.

Table 9					
Relation average wage and average revenue per worker and the ratio of the average reported wages to average current wages					
Random fixed effect model by branch					
dependent variable (log)	Average wage			Average revenue per worker		
	coefficient	95% conf. interv.		coefficient	95% conf. interv.	
Ratio average reported wages to average current wage	-0.38	-0.39	-0.36	0.82	0.80	0.85
In private sector	-0.25	-0.27	-0.23	-0.27	-0.31	-0.23
In FDI sector	0.36	0.34	0.39	-0.38	-0.43	-0.33
Share of women	0.01	0.00	0.01	0.02	0.01	0.03
Number of employees (log)	0.06	0.06	0.07	-0.16	-0.17	-0.15
Share of taxes in revenue	0.05	0.04	0.05	-0.22	-0.22	-0.21
In region 2	-0.10	-0.12	-0.09	-0.07	-0.10	-0.05
In region 3	-0.33	-0.34	-0.33	0.00	-0.01	0.02
Constant	13.23	13.20	13.27	-8.57	-8.74	-8.41
Revenue per worker (log)	0.24	0.24	0.25			
Average wage (log)				0.94	0.93	0.95
sigma_u	0.239			0.868		
sigma_e	0.477			0.934		
rho	0.201			0.463		
Number of observation	120571			120571		
Number of groups	604			604		
Average number of observation per group	199.6			199.6		
R-squared within	0.3410			0.3141		
between	0.4213			0.2791		
overall	0.2856			0.2793		

Note: all coefficients significant at 1% except the coefficients associated to the share of taxes in revenues

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[8] This group includes the most recent enterprises for which current wages are still equal to the reported wage but not by choice .

	Group 2	Group 3	Group 4	Group 5
Table 10 **Social security participation profile and relative wage and revenues per worker per branch** **Multinominal logistic regression**				
Ratio average current wage to branch's average current wages	0.55	-1.19	0.01	-7.48
In private sector	-4.55	-5.50	-1.65	-3.76
In FDI sector	-1.88	-3.23	-0.47	0.04*
Ratio average revenues per worker to branch's average revenues per worker	0.09	0.09	0.03	0.06
Share of women	0.57	0.81	-0.03	-2.96
Ratio number of employees to branch's average number of employees	0.18	0.18	0.12	0.18
Share taxes in revenues	-0.02**	0.02***	-0.38	-0.51*
In region 2	-0.61	-0.55	-0.83	0.01***
In region 3	-1.29	-0.15*	-1.54	0.43
Constant	2.66	1.47	1.77	3.44
Group 1 is the base outcome Group 1 enterprises don't register employees to social security Group 2 enterprises do not pay contributions on current wages Group 3 enterprises pay contributions on current wages Group 4 enterprises do not register all employees, do not pay contributions on current wages, and likely pay contributions on minimum wage Group 5 enterprises do not register all employees, do likely pay current wages equal to minimum wage and so, pay contributions on current wages.				
Number of observations	123629			
Pseudo R2	0.1467			

Note: all the coefficients are significant at 1% except (*) significant at 5% (**) at 10% (***) not significant.

The results in Table 9 show within branches a negative association between enterprises average wage and the ratio of the average reported wage to the average current wage. Workers that work in evading enterprises receive higher net wages. At the opposite, the results show a positive association between enterprises' revenues per worker and the ratio of the average reported wage to the average current wage. Evading enterprises do not seem to capture the unpaid contributions to realize extra revenues. However, the conclusion is not strong because the results show also in both estimations a positive relationship between the relative wage and the enterprise level of revenues per worker.

The coefficients reported in Table 10 indicate indicate that employees with the highest net wages are more likely working in enterprises that do not pay contributions on current wages (group 2). If enterprises that do not register employees to VSS did not capture any

of the contributions to realize additional revenues, highest net wages should be associated to the group 1 (in that case, the coefficient associated to the net wages in group 2 would be negative and higher than in group 3). That the employees with the highest net wages are not those working in the group 1 suggests, therefore, that employees working in enterprises that are not registered to social security are possibly in a weak position in relation to their employers. Not only they do not have their social rights respected but they receive relatively low wages. As expected, employees with the lowest net wages are more likely working in enterprises of the group 3 (that pay contributions on current wages). The coefficient associated to the workers of the group 5 is particularly low because they work in enterprises in which the average wage is under the minimum wage.

The results regarding if enterprises benefit from under-reporting are less clear. The coefficient associated to revenues per worker of the enterprises in group 2 and 3 is higher than the coefficients of the enterprises in group 1 (the base outcome group supposedly with coefficients equal to 0) and, there is no difference between the coefficients of group2 and group 3. If employees in group 1 receive relatively low wages, enterprises in group 1 do not realize higher revenues per worker. This suggests that these enterprises are maybe less efficient than the other enterprises of the same branch.

The coefficients associated to the other variables, indicate that working in the private sector (FDI or not) decreases the probability of registration to social security and, if registered, the likelihood that contributions are paid on current wages. At the opposite, being employed in enterprises with higher share of women increase the likelihood of being registered and having contributions paid on current wages. The size of the firm does increase the likelihood of being registered. Finally, enterprise's tax burden measured by the ratio of the total taxed in the revenues does not seem to have any impact.

5. Social Implications

Enterprises and employees weak inclination to contribute on current wages has important social implications. First, it contributes to the public appreciation that social security is not able to provide "meaningful' benefits. Second, it provokes leakages in the policy that social security implements towards low income earners.

Enterprises and employees weak inclination to contribute on current wages enhance public appreciation that social security is not able to provide "meaningful' benefits. For example, according to the Social Security Law, sick leave benefits are equal to 75% of the wage earned in the previous month. This regulation aims at avoiding a large drop of income because of sickness. The impact in the reality is much different. If the reported wages represent only 42.6% (as it appears on average in Table 7), social security benefits replace only 37.1% of the sick worker's current wage. This problem affects all the social insurance benefits. Old-age pensions, as a result, in many cases replace very little part of the pre-retirement income. That many pensions are very low will become evident when,

around 2015[9], the first workers who will have had contributed only from the private sector during 20 years will start retiring with pensions as low as 20.3% of their average income (= 55% of 36.9%).

Not only the worker suffers a large income shock during their sick leave or at retirement but friends and relatives judge that social benefits are useless. This frustration confirms workers in their opinion that the value of social benefits is low and do not deserve paying higher amount of contributions. As Perry observes high informality is associated with a blunt societal indictment of the quality of the state's service provision.

Enterprises and employees weak inclination to contribute on current wages creates leakages in the policy that social security implements towards low income earners. According to the Social Security Law, all employees (registered in the mandatory scheme) are entitled to a minimum pension equal to the minimum wage if they have contributed for at least 20 years.

A worker's pension benefit is, therefore, the maximum between the result of the pension formula and the minimum pension.

(5) $P_k = Max(rW_k, MinP)$

where P_k is the pension paid to the worker k, W the average of the reported wage used in the calculation, r the percentage of that income replaced by the pension benefit and MinP the minimum pension

The result of the equation (x) is determined is equal to the minimum pension when:
(6) $rW_k < MinP$

Given that the minimum pension is equal to the minimum wage, the worker k will receive the minimum pension if:

(7) $Wk < \frac{1}{r} MinWage$

For example, workers with 20 years of contribution are entitled to a pension equal to 55% of their reported wages (r = 0.55). All workers that have a reported wage under 1.82 (= 1/0.55) times the minimum wage will be entitled to the minimum pension benefit equal to the minimum wage. Workers entitled to the maximum replacement rate of 75% obtain a pension equal to the minimum wage when their average reported wage is under 1.3 (=1/.75) times the minimum wage.

Social security subsidies low income earner under the assumption that they do not have enough savings to complement pension income during retirement. This gap between

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[9] Workers who started contributing in 1995 will have contributed for 20 years in 2015. All the workers that have only contributed to the private sector and retire before that year are not entitled to monthly pension benefit.

reported and current wages creates important leakages in that policy. Many workers entitled to the minimum pensions are not low income earners. Their average current wage is higher than 1/r of the minimum wage.

This leakage is potentially very important. It is symptomatic that in the database of the Enterprise Census 3.1 percent of the enterprises report average current wages under the threshold of 1.3 of the minimum wage but they all do report average wages below.

	Total number of enterprises reporting to VSS	in which average current wage lower than 1.3 minimum wage		in which average reported wage is lower than 1.3 the minimum wage	
Table 11 **Enterprise with average wage lower than 1.3 minimum wage and enterprises reporting average wage lower than 1.3 the minimum wage**					
		number	%	number	%
State sector	**3222**	82	2.5	428	13.3
Private sector	**52667**	1669	3.2	41883	79.5
FDI	**3457**	77	2.2	1361	39.4
Total	**59346**	1828	3.1	43672	73.6

Source: Author's calculation based on the Census

	Total number of employees reporting to VSS	in which average current wage lower than 1.3 minimum wage		in which average reported wage is lower than 1.3 the minimum wage	
Table 12 **Employees in enterprise with average wage lower than 1.3 minimum wage and employees in enterprises reporting average wage lower than 1.3 the minimum wage**					
		number	%	number	%
State sector	**1598796**	44100	2.8	385017	24.1
Private sector	**2001894**	80653	4.0	1231175	61.5
FDI	**1252252**	31792	2.5	633629	50.6
Total	**4852942**	156545	3.2	2249821	46.4

Source: Author's calculation based on the Census

These problems of leakage have important financial implication. The provision of minimum pensions implies transfers of resources from average and high income earners to low income earners. Everything being the same, if only the pension formula was used to calculate pensions, low income earners would receive lower pensions and the system

would have more resources "not used" and for example, a more generous pension formula could be applied. At the contrary, the payment of the minimum pension to retirees who are not low income earners raises financial concerns. It enlarges the amount of resources needed to finance the policy, and at term, it obliges to introduce less generous pension formula to "free up" more resources to finance the minimum pension.

6. Conclusions

This study investigated enterprises' registration to VSS and employee's preferences regarding social insurance. The results show strong evidence that employees working in enterprises that evade (registration or contributions) receive higher net wages than employees of the same industry working in enterprises that do not evade. The main reason for evasion does not seem rooted, therefore, only in enterprises' willingness to obtain higher revenues per worker. These results corroborate the view that in Vietnam workers collude with employers to evade social insurance contribution (Dao Quang Vinh, 2008?).

Employee's lack of understanding of social insurance is probably one of the causes of such behavior. Employee's low valuation of social insurance is probably another important factor. As L. Summers (1989) explains, employees are not willing to work in enterprises that pay contribution if the Social Security mandated benefits are worthless to them. As Perry observes, in a review of issues related to the informal sector in Latin America, this view suggests that high informality results from a blunt societal indictment of the quality of the state's service provision.

What factor currently dominated in Vietnam is difficult to say. It is likely, however, that in the absence of reform, population's dissatisfaction for social insurance services will steadily growing in the future. Employee's reported wages are so low that social insurance benefits cannot prevent huge income drop in case of sickness, maternity leave or retirement. Evidence that social insurance benefits are useless will be growing as employees who have only worked in the private sector will become pensioners. It could happen that, in many cases, pension benefits will replace less than 20% of the employee's pre-retirement average income. Pensioners' frustration will confirm workers in their opinion that the value of social benefits is low and do not deserve paying higher amount of contributions.

The irony of the situation is that while the population will show increasing disappointment regarding social insurance, the system financial will be abnormally employ large amount of resources to provide minimum pensions. Initially designed to provide higher replacement rates to low income earners, this policy will benefit to a much larger group of workers that have reported particularly low wages but were paid higher amounts. This unbalance between pension benefits and contributions will erode the system financial sustainability and increase the public perception that VSS institution is rather weak in managing the pension system.

Changing enterprises' and employee's attitude toward social security is crucial if the government desires to build a financially sustainable social security system that achieves large coverage rates. Law enforcement's policies will have probably limited impact if other policies are not implemented to increase employees' awareness of their social rights, and the consequences of wage under-reporting.

Annex 1

Some enterprises report levels of contributions that appear inconsistent with the number employees they report and the legal minimum wage. Legally, the minimum level of contribution per worker must be equal to 0.23% of the minimum wage over the year. One possibility is that these enterprises hire part-time workers, but in Vietnam such a practice is rare. Another possibility is that part of the employees were hired or fired during the year. Since only the employees with some long commitments with enterprises are likely to be registered to the Vietnam Social Security, the study assumes that these workers who have been hired or fired during the year are not registered. Accordingly, the number of the employees these enterprises report to the Vietnam Social Security is the number so that the average contribution per employee is equal to 23% of the minimum wage in the year.

Let's assume that N is the total number of employees reported by the enterprises, B the total amount of wage and C the level of contributions. If w is the minimum wage, the average contribution per worker should be higher or equal to 23% of the minimum wage:

(1) $\dfrac{C}{N} \geq 0.23 * w$

Based on the information presented in Table A1, it appears that 39109 enterprises (65.9% of the total of the enterprises in the Census) do not verify (1).

Table A1			
Level of the minimum wage in Vietnam in 2005 in thousand VND			
Period	Domestic	FDI region 1	FDI region 2	FDI region 3
Jan-Sept	290	626	556	487
Oct-Dec	350	626	556	487
Yearly average	305	626	556	487
Note: Region 1 includes FDI enterprises in the urban districts of Hanoi and Ho Chi Minh City. Region 2 includes FDI enterprises in the suburban districts of Hanoi and Ho Chi Minh City and the urban districts of Haiphong, Halong (Quang Ninh province), Bien Hoa(Dong Nai province), Long Khanh, Nhon Trach, Long Thanh, Vinh Cuu and Trang Bom (Dong Nai province) Thu Dau Mot, Thuan An, Di An, Ben Cat and Tan Uyen (Binh Duong) Vung Tau (Ba Ria - Vung Tau province). Region 3: includes all the other areas				

In these enterprises, the average contribution per worker is lower than 23% of the average wage in a year. Accordingly, the number of employees registered by these enterprises to the Vietnam Social Security was assumed the number N* so that the reported amount of contribution is equal to 23 % of the minimum wage.

(2) If $\dfrac{C}{N} < 0.23.w$ then $N^* = \dfrac{C}{0.23.w}$

As the figures in Table A2 indicate, the correction reduce the number of employees likely registered to the Vietnam Social Security from 4 852 942 to 3 970 591.

Table A2 Adjustment of the number of registered employees Enterprises that that contribute to the Vietnam Social Security only	
1. Total number of employees	
Enterprise sector	4852942
+ State sector	1598796
+ Private sector	2001894
+ FDI	1252252
2. Total number of employees after adjustment for inconsistency between the level of contributions and the obligation to pay workers at least the legal minimum wage	
Enterprise sector	3970591
+ State sector	1451039
+ Private sector	1416344
+ FDI	1103208

The figures in Table A2 give a rough estimate of the size of the workers with short-term contracts. About 18.2% [=(4852942 - 397059)*100/ 4852942] of the total employees could be in that case.