

Finally, we investigate both international and domestic forward linkages in a regression framework in Table 5.2 below. Larger firms are much more likely to report transfers of technology from suppliers and limited liability and joint stock companies are more likely than FDI firms, the base category, to report such transfers.

Table 5.2: Technology Transfer from Suppliers, Regression Analysis

Dependent variable is 1 if forward linkage reported, 0 otherwise						
	(1)		(2)		(3)	
	Int'l	se	Domestic	se	Both	se
Micro (1-9)	-0.04	(0.02)	-0.00	(0.01)	-0.02	(0.02)
Medium (50-299)	0.08+	(0.01)	-0.00	(0.01)	0.04+	(0.01)
Large (300+)	0.13+	(0.02)	0.05+	(0.01)	0.07+	(0.02)
State-owned	0.13	(0.08)	0.09	(0.06)	0.16	(0.08)
Collective	0.03	(0.04)	-0.06+	(0.01)	0.08*	(0.04)
Private Ent.	-0.04*	(0.02)	-0.08+	(0.01)	0.01	(0.02)
Limit'd Liab Co.	0.05+	(0.02)	-0.02*	(0.01)	0.07+	(0.02)
Joint Stock, no State	0.08+	(0.02)	0.01	(0.01)	0.10+	(0.02)
Joint Stock, State	0.10+	(0.04)	0.05*	(0.03)	0.09+	(0.04)
FDI and State	0.06	(0.06)	0.07	(0.05)	0.07	(0.06)
FDI and Private	0.08	(0.05)	0.04	(0.04)	0.06	(0.05)
Observations	8,109		8,040		8,107	
Region Effect	Y		Y		Y	
Sector Effect	Y		Y		Y	
Pseudo R-squared	0.071		0.19		0.062	
Note: Marginal effects from Probit model, standard errors to right of coefficients clustered at firm level. Base: Small, FDI, Region 7 (HCMC), Food Processing (ISIC 15). Sector effects are at 2-digit level. Robust standard errors in parentheses.+ p<0.01. * p<0.05						

As in the case of backward linkages, the evidence from the 2011 cross-section of TCS data implies that linkages are not necessarily more likely to arise through contact with international firms, and that domestic suppliers remain an important source of technology diffusion for the majority of respondents. In both cases, the transfer is usually explicitly addressed in the contract between firms.

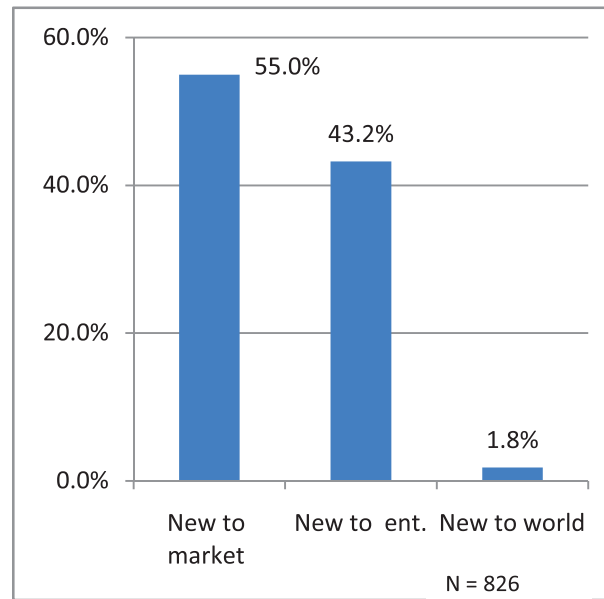
## 6 Alternative Paths to Innovation: Research, Adaptation, and Modification

Previous sections focus on spillovers: technology transfers that arise from interactions between competitors, buyers, and sellers. Capturing these spillovers is one justification for investment promotion. An alternative to spillovers produced through commercial interaction is investing in research and development to generate new technology. This is generally expensive and prone to failure when compared to adaptation: buying “off-the-shelf” technology known to be effective. Solo (1966) famously pointed out that even if the right technology is available, any technology requires many other complementary factors to be effective. In other words, the “right” technology is not automatically the appropriate one (Chandra (2006) emphasises this point in an extensive study of how some emerging economies achieve success in export markets through adaptation).

Very few studies are able to directly compare the relative benefits of adaptation compared to research and development. One exception is Basant and Fikkert (1996) who do this using data from Indian firms. They find that investments in existing technology (adaptation) provide a better return for the firms than research. Nevertheless, research and development continues to be regarded as a major indicator of technological sophistication, and has been emphasised in some elements of Vietnamese policy.

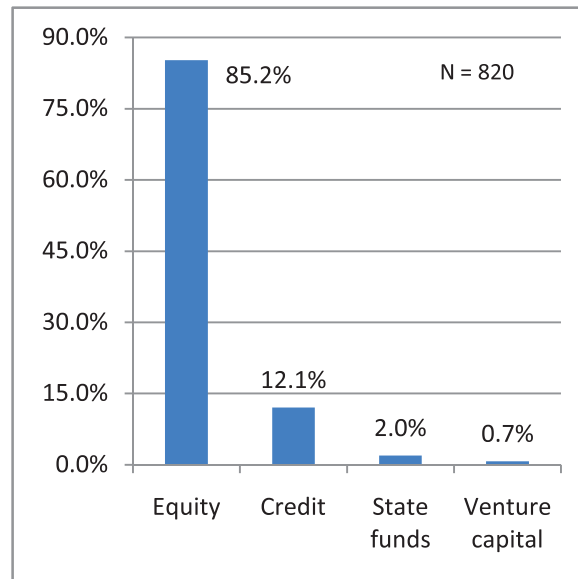
Of the 8,107 firms in the sample, 826 (10.2%) reported investing in some type of research and development in 2011. As we see in Figure 6.1 below, most of this research expenditure (55% in a sample of 826) is dedicated to developing technology that is new to the market in which the firm operates, rather than “frontier research” that is new compared to technology available elsewhere. This indicates that some research and development spending could be better allocated towards adapting and modifying technology that already exists globally, a topic we turn to below. The remainder (43%) is mainly devoted to developing technology that is new to the enterprise, and some of this spending could be allocated towards adopting technology being used by firms in the same sector.

Figure 6.1: Originality of Research Output



While it is difficult to make detailed inferences about the state of domestic research and development, the evidence from the TCS suggests most of the research spending is not allocated to “original” technology but to developing technology that may be available globally or even nationally. To the extent that this is accurate, firms could probably obtain technology at lower cost and with less risk of failure than through investing in original research. Over the short term, policymakers may find the payoffs to industrial policy focused on adopting existing technology are higher than emphasising original research. Figure 6.2 shows that undertaking this research is costly for firms, which mainly finance the mode of innovation through equity like retained earnings. State financing and co-financing programs do exist, but only 2% of the sample of 820 firms reported using this type of financing for research.

Figure 6.2: Financing Research



One possibility is for firms to promote research linkages with institutions, firms, and research centres in other countries, a model that has been successfully implemented in several other countries. Investigating this in the TCS is hampered by a very small number of respondents (just 23) who acknowledged having an external research partner. Of this small sub-sample, over half reported their research partner was in the same province, and around 20% reported the research partner to be in another Vietnamese province; five firms in the sample of over 8,000 reported having a research partner outside Vietnam.

While research and development remains an important frontier activity in many countries, the gains from spillovers and adaptation should still be high enough for an emerging economy like Vietnam that these mechanisms should generally be prioritised over investing in original research outputs.

Given the relevance of research and development to contemporary discussions about what form of industrial policy is appropriate to Vietnam, we analyse the determinants of undertaking research activity in a regression framework in Table 6.1 below.



Table 6.1: Research and Development, Regression Analysis

Dependent variable is 1 if firm does R&D, 0 otherwise						
	(1)		(2)		(3)	
	coef	se	coef	se	coef	se
Micro (1-9)	-0.03*	(0.01)	-0.03*	(0.01)	-0.03+	(0.01)
Medium (50-299)	0.05+	(0.01)	0.05+	(0.01)	0.06+	(0.01)
Large (300+)	0.09+	(0.01)	0.10+	(0.02)	0.13+	(0.02)
State-owned	0.11	(0.06)	0.11	(0.06)	0.11	(0.07)
Collective	-0.01	(0.02)	-0.02	(0.02)	0.01	(0.03)
Private Ent.	-0.04+	(0.01)	-0.04+	(0.01)	-0.03*	(0.01)
Limit'd Liab Co.	0.02	(0.01)	0.02	(0.01)	0.03+	(0.01)
Joint Stock, no State	0.07+	(0.01)	0.06+	(0.01)	0.07+	(0.02)
Joint Stock, State	0.16+	(0.03)	0.15+	(0.03)	0.15+	(0.03)
FDI and State	0.09*	(0.05)	0.09*	(0.04)	0.07	(0.04)
FDI and Private	0.09*	(0.04)	0.09*	(0.04)	0.08*	(0.04)
Observations	8,107		8,107		8,045	
Region Effect	N		Y		Y	
Sector Effect	N		N		Y	
Pseudo R-squared	0.056		0.058		0.11	
Note: Marginal effects from Probit model, standard errors to right of coefficients clustered at firm level. Base: Micro, FDI, Region 7 (HCMC), Food Processing (ISIC 15). Sector effects are at 2-digit level. Robust standard errors in parentheses.+ p<0.01, * p<0.05.						

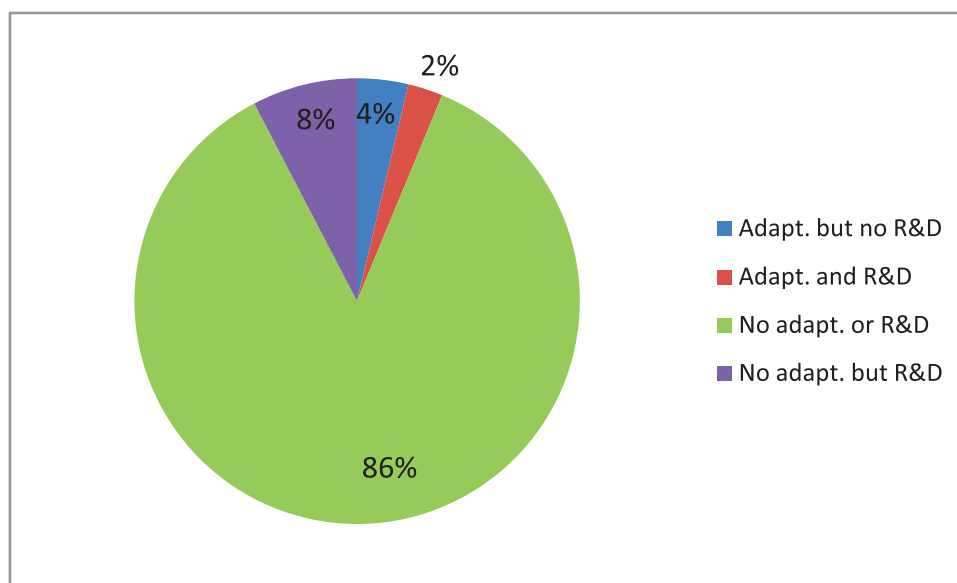
Examining column three (which controls for region and sector effects), we find that firms are significantly more likely to undertake research. Private firms are relatively less likely than FDI firms (the base category) to report having invested in research and development in 2011. Surprisingly, the largest and most precisely estimated coefficients are associated with joint stock companies: while only a small minority of firms do any research at all, larger, public firms are most likely to do so.

## 6.1 Adaptation and Modification

A natural alternative to making costly investments in research is to pursue adaptation: purchasing appropriate technology and adapting it to local circumstances or for interoperability with existing machinery, equipment, and production processes. This is closely related to the idea of purchasing embodied technology discussed earlier and, indeed, much of the technology transferred through backward or forward linkages may be adapted. The distinction is that adaptation involves the firm actively searching out and investing in specific technologies, rather than transfers that arise through commercial interaction.

The 2012 round of the TCS produced data on research and adaptation for 8,106 firms. As we see in Figure 6.3, the vast majority of these companies did not engage in either activity, while the remainder (16%) invested in innovation through either adaptation, research, or both.

Figure 6.3: Share of Firms Doing Adaptation, Research



In addition to reiterating the earlier finding of research and development's minority role in domestic innovation, this suggests that policymakers can encourage large numbers of firms that currently do not have an adaptation strategy to develop one: investing in technology that already exists is relatively inexpensive (compared to research) and is more likely to succeed.

We use a regression framework to evaluate the role that firm characteristics play in the decision to invest in research or adaptation (results in Table 6.2). Both adaptation and research are more likely amongst larger firms, and joint stock companies are more likely than FDI-firms to engage in both research and adaptation.

Table 6.2: Determinants of Research and Adaptation, Regression Analysis

Dependent variable is 1 if firms does adaptation, research or both, 0 otherwise						
	(1)		(2)		(3)	
	Adapt.	se	R&D	se	Both	se
Micro (1-9)	-0.02+	(0.01)	-0.02	(0.01)	-0.02	(0.01)
Medium (50-299)	0.00	(0.01)	0.04+	(0.01)	0.02+	(0.00)
Large (300+)	0.03+	(0.01)	0.09+	(0.02)	0.06+	(0.01)
State-owned	0.00	(0.03)	0.06	(0.06)	0.08	(0.06)
Collective	-0.00	(0.01)	0.01	(0.03)	-0.00	(0.01)
Private Ent.	0.01	(0.01)	-0.02*	(0.01)	0.00	(0.01)
Limit'd Liab. Co.	-0.01	(0.01)	0.01	(0.01)	0.02+	(0.01)
Joint Stock, no State	-0.00	(0.01)	0.05+	(0.01)	0.03+	(0.01)
Joint Stock, State	0.03	(0.02)	0.08+	(0.03)	0.12+	(0.03)
FDI and State	0.03	(0.03)	0.02	(0.04)	0.08	(0.04)
FDI and Private	-0.00	(0.02)	0.06	(0.04)	0.02	(0.02)
Observations	6,755		7,459		6,404	
Region Effect	Y		Y		Y	
Sector Effect	Y		Y		Y	
Pseudo R-squared	0.085		0.089		0.15	
Note: Marginal effects from Probit model, standard errors to right of coefficients clustered at firm level. Base: Small, FDI, Region 7 (HCMC). Robust standard errors in parentheses. + p<0.01, * p<0.05.						

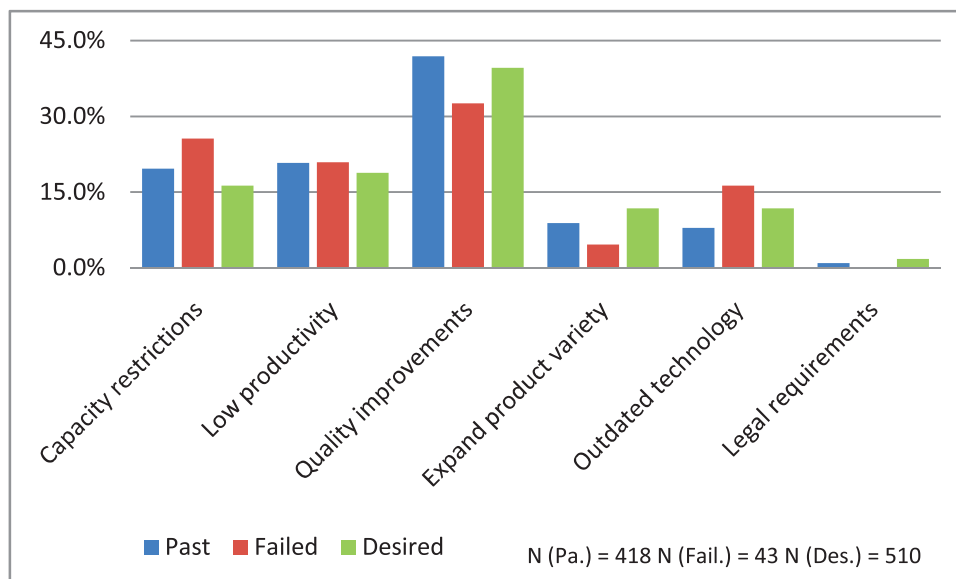
## 6.2 Constraints to Adapting Technology

Given the intuitive benefits to firms that are able to adapt technology, regression analysis and sample averages presented in section 6.1 are surprising: relatively few firms invest in adaptation, and those that do are larger firms, typically joint-stock companies. Policymakers may want to encourage adaptation as a relatively low-cost way for companies to invest in improved technology. To support this, the TCS investigates why firms want to invest in adaptation and the constraints that prevent them from doing so.

Specifically, the survey questionnaire asks responding firms to summarise their experience of past adaptations, failed adaptations, and desired / anticipated adaptations the firm plans to make in the future. Figure 6.4 shows the share of respondents reporting that the reason listed on the horizontal axis was the main motivation for adaptation. Regardless of whether we examine previous, failed, or future planned adaptation investments, the main motivation for the investment is to improve quality. This is consistent with the idea of firms beginning to move up the quality ladder: while relatively low-cost labour and imported technology that is far from the technological frontier generated a high rate of economic growth, increasing regional competition and domestic labour costs mean that firms are

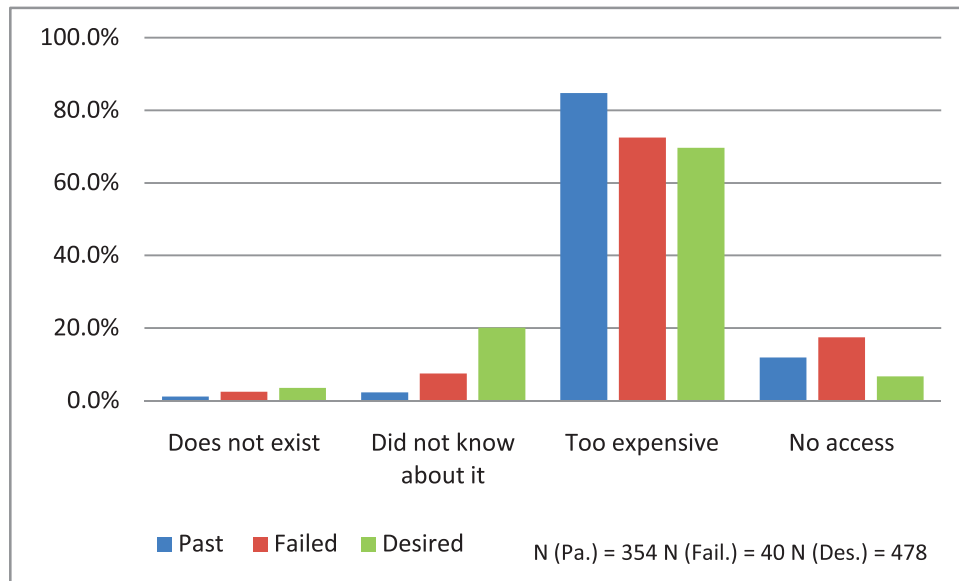
seeking to compete in higher value-added activities. Investing in technology should be one part of this strategy, and firms appear to desire improvements in quality and productivity.

Figure 6.4: Reasons for Adaptation



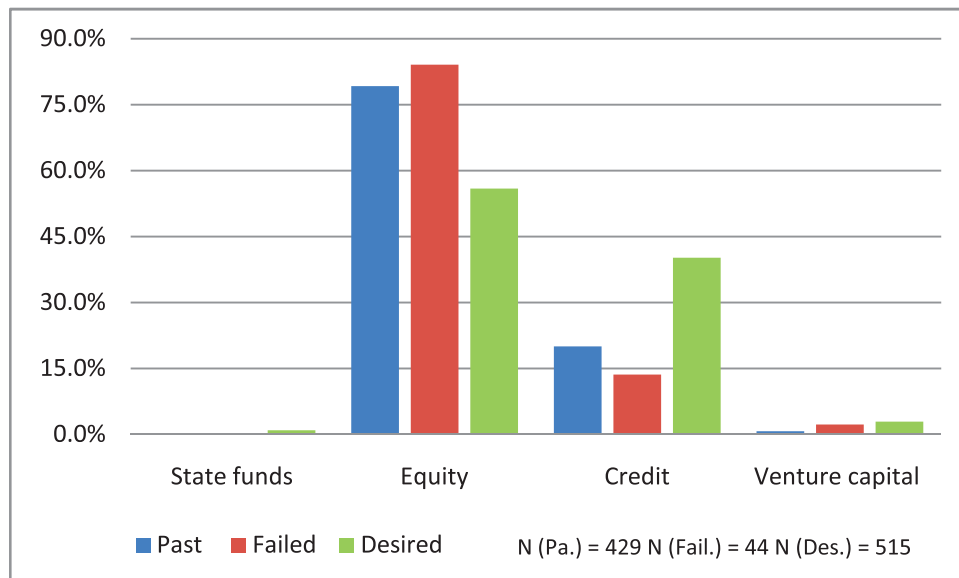
Given that firms want to invest in innovation through adaptation, the TCS also investigates the constraints that firms report prevent them from making these investments. Figure 6.5 shows the share of respondents that listed each constraint as the “most severe.” The sample (though small) is clearly dominated by financial constraints: firms would like to invest in technology that could be adapted but do not have access to credit or enough internal capital. Beck and Demirguc-Kunt (2006) show that this problem is not unique to Vietnam: Small- and Medium-size Enterprises (SMEs) in many emerging economies suffer from financing constraints, and argue that policymakers should consider financial innovation (instruments like leasing and factoring of equipment, for example) to meet firms’ need for finance. This represents an area where appropriate industrial policy could intervene, for example by instituting schemes to expand access to low-interest loans for firms with credible technology adaptation strategies.

Figure 6.5: Reasons for Technology Adaptation Rather than Purchase



The need for improved access to finance is underlined by survey data on how firms financed or plan on financing adaptation. Figure 6.6 summarises the share of respondents reporting various funding mechanisms as being the most important. 103

Figure 6.6: Financing of Adaptation



The sample is dominated by firms that rely or relied on equity to finance adaptation, meaning that firms' ability to invest in productive technology depends on internal capital like retained earnings. This corroborates the evidence that financial constraints prevent firms from investing in appropriate

technology, while the large difference between the desired use of credit and the use of credit to finance past and failed adaptations further suggests that firms would make use of credit schemes that are transparent, widely available, and preferential (compared to standard borrowing rates).

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## 7 Corporate Social Responsibility (CSR)

The concept of Corporate Social Responsibility (CSR) has been widely discussed (see Kitzmueller and Shimshack, 2012 for a thorough review), but there is no general agreement about its definition. Moreover, there is also disagreement in the academic literature about whether CSR improves firm performance or whether improvements in CSR levels is a necessity for firm survival (at given performance rates). Improvements in CSR can be seen as part of a natural development of a modern enterprise in a competitive environment. If a firm wants to survive it has to “follow the stream” and develop/improve its corporate social responsibility. Not doing so can be seen as “managerial slack”, and could cause firms to become uncompetitive and shut down.

However, the management literature (see for example McWilliams and Siegel, 2001) highlights several reasons for a positive association between CSR and firm performance. First, a positive effect may come through improvements of the company’s image and reputation, which in turn has been shown to influence firm competitiveness and performance. Second, an improved CSR strategy may improve employee motivation, retention and recruitment. This effect may come through reputation improvement, but can also come directly through a motivation effect of employees as a result of (perceived) improvements in their working environment. Third, it has been argued that CSR strategies may lead to efficiency gains as firms become more open to alternative production strategies and to investors with a higher sensitivity to sustainability issues. Fourth, improvements in CSR may increase revenue; either indirectly through improved brand image or directly by CSR-driven product or market development (for example, niche markets - e.g. fair trade certification). Finally, CSR has also been described as a way of reducing or managing CSR-related risks, avoiding negative press.

The 2012 survey follows up on the previous reports by re-asking a set of CSR related questions to explore the extent to which firms in Vietnam engage in (and change their) socially responsible behaviour and incorporate these activities into their corporate strategy. Particular attention is paid to three dimensions of corporate social responsibility: The extent to which the firm (i) complies voluntarily with labour and environmental standards (compliance related CSR – 3 indicators), (ii) has a well-developed CSR strategy at the management level that goes beyond compliance with existing regulations (management related CSR - 4 indicators), and (iii) engages in beyond compliance community based activities not directly linked to firm operations (society related CSR - 8 indicators). Based on these indicators we generate a CSR index measuring the degree of CSR related activities undertaken by the individual firm. In this report we attempt to describe how these various indicators of CSR and the CSR index relate to different firm characteristics.

### 7.1 Measuring Corporate Social Responsibility (CSR)

Although several papers (see Kitzmueller and Shimshack, 2012 for details) have empirically tried to pin down indicators of CSR, no common measurement or definition exists. The International

Organization for Standardization (ISO) has launched a recommendation for CSR behaviour and the UN Global Compact initiative has provided 10 principles as a set of guidelines for insuring that products and services are produced under decent conditions (responsible supply chain management). Among these principles are two human rights related, four labour-related, three environmentally related and one anti-corruption principle. However, according to Kitzmüller and Shimshack (2012) the literature often also includes local community/society related CSR initiatives in the definition. According to their comprehensive overview CSR can be defined as “social or environmental behaviour that goes beyond the legal and regulatory requirements of the relevant markets and/or economies” (pp.53). This CSR definition follows closely that of CSR Compass ([www.csrcompass.com](http://www.csrcompass.com)), where CSR is described by the voluntary initiatives of companies to integrate social and environmental considerations into their business activities and their interactions with stakeholders. This means that CSR activities are characterized by the fact that a company’s activities extend *beyond* its mandatory legal responsibilities (McWilliams and Siegel, 2001). In order to encompass the varied definitions of CSR we consider both compliance and “beyond compliance” indicators. This also allows us to link our results to the previous TCS report from 2011.

As mentioned above, in this report we divide our CSR index into three sub-components (See Table 1 for details):

- Labour related responsibilities (3 indicators): Compliance indicators
- Management related responsibilities (4 indicators): Beyond compliance indicators
- Society related responsibilities (8 indicators): Beyond compliance indicators

Labour-related responsibilities are those that firms by law are required to provide. They are providing permanent staff with written contracts, setting up local trade unions, and paying social and health insurance. As such, our measures of labour related CSR are closely linked to whether or not a given firm complies with existing labour regulations. Management-related responsibilities address the extent to which the firm has CSR practices as a central part of its business strategy. Finally, indicators of society-related responsibilities document the extent to which firms actively engage and support local community activities not directly related to the firm’s commercial activities.



Table 7.1: Corporate Social Responsibility (CSR) Indicators

	2011	2012
<b>Labour</b>		
All permanent employees have a written labour contract?	100%	93%
Enterprise has a local/plant level trade union?	48%	51%
Enterprise pays contribution to social insurance for employees?	71%	73%
Enterprise pays contribution to health insurance for employees?	71%	74%
<b>Management</b>		
Has committee/board overseeing CSR practices?	36%	36%
Has written down CSR policy?	72%	72%
Member of groups or has agreements that promote CSR standards?	3%	2%
Has been awarded CSR type certifications or awards?	10%	11%
<b>Community</b>		
1. Environmental Protection	26%	28%
2. Education	8%	9%
3. Infrastructure Development	8%	8%
4. Health Care services	5%	5%
5. Youth Development	3%	3%
6. Poverty Alleviation	20%	22%
7. Local Heritage	3%	3%
8. Sporting events	5%	5%

Note: Data restricted to firms with CSR information in both 2011 and 2012. This leaves 4,901 firm observations each survey year.

Table 7.1 documents the proportion of firms engaged in CSR related activities on the basis of these measures and reveals very little change over time (on average) in the share of firms carrying out specific CSR related activities. Moreover, the share of firms carrying out compliance related CSR activities (labour related responsibilities) is generally high, whereas beyond compliance CSR activities (management and society related responsibilities) are much lower on average. In fact 18 percent of firms in the sample do not carry out any of the beyond compliance CSR related activities.

Disaggregating by sub-group of the CSR index and starting with labour related CSR indicators; we observe that most permanent workers have written labour contracts, a result that is independent of firm size and form of ownership (see Table 7.2 and Table 7.3). Moreover, a large share of Vietnamese firms provides social and health insurance and severance pay, which is also indicative of most employees having labour contracts in accordance with existing laws. However, from Table 7.2 and Table 7.3 we see that labour law compliance is more likely to be observed in larger firms as well as in state and foreign firms. Levels of unionization across different types of firms follow the same trend, indicating that law compliance and firm size are closely related.

Table 7.2: Corporate Social Responsibility (CSR) Indicators, by firm size

	Micro	Small	Medium	Large
<b>Management</b>				
Has a committee/board overseeing CSR practices?	22%	25%	42%	55%
Has a written down CSR policy?	61%	65%	76%	83%
Member of standards groups or agreements that promote CSR standards?	1%	1%	3%	7%
Has been awarded CSR type certifications or awards?	4%	6%	12%	20%
<b>Labour</b>				
All permanent employees have a written labour contract?	95%	97%	97%	97%
Enterprise has a local/plant level trade union?	5%	25%	65%	90%
Enterprise pays contribution to social insurance for employees?	27%	55%	87%	97%
Enterprise pays contribution to health insurance for employees?	29%	56%	87%	97%
<b>Community</b>				
1. Environmental Protection	18%	26%	30%	28%
2. Education	6%	7%	9%	13%
3. Infrastructure Development	5%	8%	9%	9%
4. Health Care services	2%	3%	6%	7%
5. Youth Development	1%	2%	4%	4%
6. Poverty Alleviation	21%	20%	23%	23%
7. Local Heritage	2%	3%	3%	3%
8. Sporting events	4%	3%	6%	9%

The second sub-group of the aggregate CSR index is related to management. As illustrated in Table 7.1, approximately one-third of both the 2011 and 2012 sample report to have some kind of committee in place to determine CSR policies, and this share is increasing in firm size. Moreover, 72 percent of the sample report that they have written down CSR policies. Both these indicators may be a signal of the seriousness of the firm's social responsibility strategy.

However, these statistics should be considered alongside the fact that very few firms are formally certified in relation to the core CSR policies. One clear goal for the future could therefore be to improve policies that help companies obtain internationally recognized CSR certifications such as those described by the International Organization for Standardization (ISO), the UN Global Compact initiative and/or CSR Compass.

In addition to CSR initiatives directly impacting workers through labour contracts or the firm business strategy through management related CSR activities, the firms can participate in and financially support their local communities. Tables 7.1-7.3 show the range of community-based activities enterprises engage in.