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Measuring and Examining Innovation in Philippine Business and Industry

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List of Acronyms

ASEAN	Association of Southeast Asian Nations
BOI	Board of Investments
BPO	business process outsourcing
CALABARZON	Cavite, Laguna, Batangas, Rizal, and Quezon
DBM	Department of Budget and Management
DICT	Department of Information and Communications Technology
DOST	Department of Science and Technology
DTI	Department of Trade and Industry
GDP	gross domestic product
GII	Global Innovation Index
IBPAP	Information Technology and Business Process Association Philippines
ICT	information and communications technology
IPA	investment promotion agency
IPRs	Intellectual Property Rights
MSMEs	micro, small, and medium enterprises
NCR	National Capital Region
NEDA	National Economic and Development Authority
NIASD	National Innovation Agenda and Strategy Document
NIC	National Innovation Council
OECD	Organisation for Economic Co-operation and Development
PEZA	Philippine Economic Zone Authority
PIDS	Philippine Institute for Development Studies
PSA	Philippine Statistics Authority
R&D	research and development
RSEs	R&D scientists and engineers
S&T	science and technology
S4CP	Science for Change Program
SDGs	Sustainable Development Goals
SIA	Survey of Innovation Activities
STI	science, technology, and innovation

STRIDE	Science, Technology, Research, and Innovation for Development
UNESCO	United Nations Educational, Scientific and Cultural Organization
VAT	value-added tax
WB	World Bank

Abstract

Innovation involves implementing new or significantly improved goods and services, production processes, marketing, or organizational methods for adding value. The measurement of innovation provides a mechanism for benchmarking national performance, as well as allows a better understanding of its relation to economic growth. Further, examining determinants and bottlenecks to innovation among firms provides inputs to mainstreaming of policies on innovation. In this paper, results of the 2015 Survey of Innovation Activities (SIA), conducted by the Philippine Institute for Development Studies (PIDS), are described and discussed. Survey results suggest that less than half of the firms in the country were innovators, with larger-sized firms innovating more than the micro, small, and medium establishments (MSMEs). The most common innovative behavior among firms was process innovation. Effects of innovation were observed to be largely customer-driven. Firms identified cost factors as the most important barrier to innovation. Knowledge and cooperation networks for innovation need strengthening. Government support and its role on innovation was also limited. Firms hardly accessed technical assistance from the government and research institutions. Similarly, firms have limited cooperation with the academe in terms of innovation activities. Firms cooperated more internally with establishments within their enterprise, their customers, and suppliers for their innovation activities. Given these issues, the government needs to have a champion for developing stronger policies and interventions to support and encourage innovation. It is also important to improve information dissemination regarding public programs available to assist firms to pursue innovation. Networking, linkages, and collaboration among the government, industry associations, and universities and research institutions also require further enhancement.

Introduction

In the past decade, innovation, particularly technological innovation, has drastically transformed society's ways of doing things. Innovation has always been associated with improved productivity and competitiveness. Consequently, governments have recognized innovation as an important driver for sustained economic growth and development, as well as a key to finding enduring solutions to socioeconomic and environmental challenges, such as creating new jobs for a continually growing population and promoting energy efficiency. The Sustainable Development Goals (SDGs)—the successor agenda to the Millennium Development Goals—which countries committed in 2015 to achieve by 2030, include SDG 9, a goal to “build resilient infrastructure, promote inclusive and sustainable industrialization, and foster innovation” (UN 2015). Moreover, the Philippine government has laid out in the *2017–2022 Philippine Development Plan* an entire chapter covering a goal to vigorously advance science, technology, and innovation (STI) in the country (NEDA 2017).

In business and industry, innovation consists of radical developments or many small changes in product design and quality, production processes (or the way in which production is organized), and management, marketing, or maintenance practices that collectively modify products and processes, bring costs down, increase efficiency and productivity, enhance customer welfare, and ensure environmental sustainability. The role of government is crucial for establishing and maintaining the proper climate for innovation.

State of innovation in the Philippines

In the *2017 Global Innovation Index (GII) Report*, the Philippines ranked 73rd out of 127 economies in an overall measure of the innovation climate. Out of seven Association of Southeast Asian Nations (ASEAN) member-states, the country is 5th for 2017, behind Singapore (7th), Malaysia (37th), Viet Nam (47th), and Thailand (51st), but ahead of Indonesia (87th) and Cambodia (101st). The *GII*¹ is a composite measure of innovation composed of various indicators on seven pillars: institutions, human capital and research, infrastructure, market sophistication,

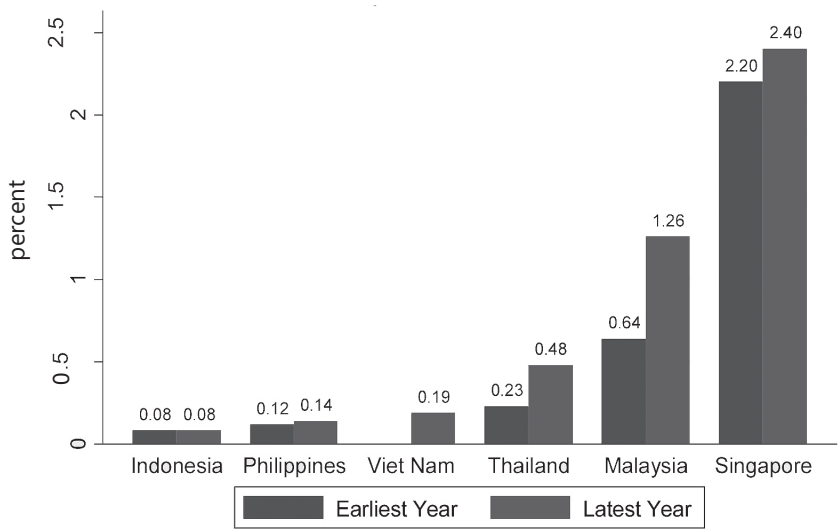
¹ The *GII* is based on data derived from several sources, including the International Telecommunication Union, the World Bank, and the World Economic Forum. It is published as a collaboration between Cornell University, INSEAD, and the World Intellectual Property Organization and their Knowledge Partners.

business sophistication, knowledge and technology output, and creative output. Further examination of the components of the GII shows that although the Philippines tops exports of information and communication technology (ICT) services in ASEAN, it has limited human capital in science and technology, rather low levels of research and development (R&D) expenditure, and weak linkages of actors in the innovation ecosystem.

Innovation is usually associated with invention, thus, its measurement has traditionally focused on monitoring R&D indicators, such as R&D expenditure and the number of R&D scientists and engineers (RSEs) per million people. R&D investments, including the development of human capital engaged in R&D, are important for improving innovation and technological capability in the country. The share of R&D expenditure to gross domestic product (GDP) describes technological capacity and innovative efforts in a country inasmuch as R&D investments enhance a country's innovation ecosystem. The number of human resources available for knowledge creation and transfer, i.e., the number of RSEs per million people, describes advancement in knowledge and technological applications, as well as diffusion of new knowledge.

With regard to R&D spending, while the Philippines has had a slight increase in the share of R&D expenditure to GDP in recent years (Figure 1), this is still less than a fifth of 1 percent of GDP, which is below the 1-percent benchmark recommended by the United Nations Educational, Scientific and Cultural Organization (UNESCO). As indicated in a report of the ASEAN Secretariat (2017), R&D expenditure (to GDP) in the Philippines also falls below those of several ASEAN member-states, especially Singapore (2.4%) and Malaysia (1.3%), and even including Thailand (0.5%) and Viet Nam (0.2%). The relatively low spending on R&D activities in the country has been noted even more than a decade ago in several studies (e.g., Macapanpan 1999; Cororaton 2002; Patalinghug 2003), and reflects the low priority provided to STI.

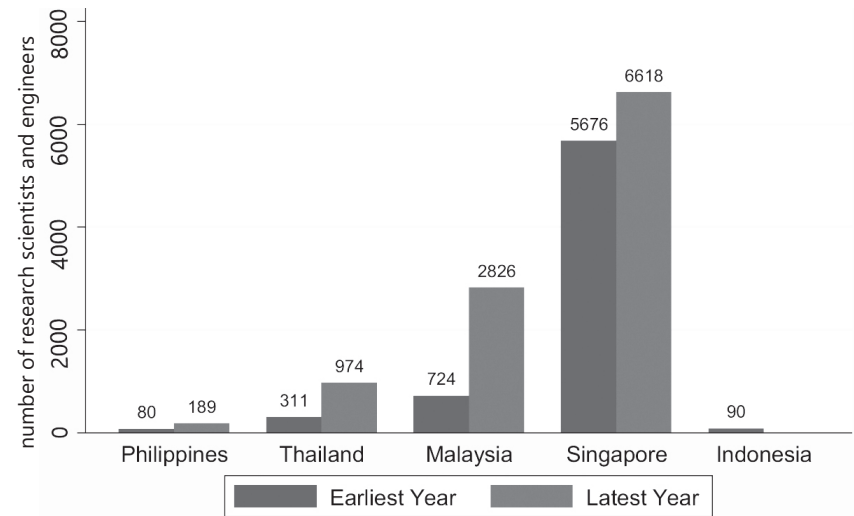
Figure 1. R&D expenditure among ASEAN member-states, as percentage of gross domestic product



R&D = research and development; ASEAN = Association of Southeast Asian Nations
Notes: Earliest year: Singapore (2005), Thailand (2005), Philippines (2005), Malaysia (2006), Indonesia (2009); Latest year: Thailand (2010), Malaysia (2013), Philippines (2013), Indonesia (2013), Singapore (2015)
Source: ASEAN Secretariat (2017)

In the period 2005–2015, the number of RSEs per million people has increased in the country (Figure 2), but the level in the latest years (189) is still far from those of several ASEAN member-states, such as Singapore (6,618), Malaysia (2,826), and Thailand (974), and only about half of the UNESCO benchmark of 380 RSEs per million people (ASEAN Secretariat 2017).

Figure 2. Number of research scientists and engineers per million people



Notes: Earliest year: Singapore (2005), Thailand (2005), Philippines (2005), Malaysia (2006), Indonesia (2009); Latest year: Thailand (2010), Malaysia (2013), Philippines (2013), Indonesia (2013), Singapore (2015)

Source: ASEAN Secretariat (2017)

Although there is an overlap between R&D and innovation, these concepts² are quite different. Innovation is “new, good ideas put to work”. It involves the creation, development, deployment, and economic utilization of new knowledge as new products and new services (OECD 1997). New knowledge is not necessarily new in absolute terms. What is crucial is that an innovation increases value, whether customer value or producer value. Innovation activities, thus, go beyond inventions and R&D. They involve the implementation of technological innovation (development of new or significantly improved products or processes) or nontechnological innovation (new marketing or organizational

² Some R&D outputs, such as some elegant mathematical research outputs, may not have a specific direct application in improving productivity, but may have an indirect impact on an economy because of their usefulness not only to research in other fields but also to businesses seeking to develop new products and production processes. However, measuring these indirect effects in terms of economic returns would be extremely challenging and difficult to identify and takes considerable time for the R&D output to be applied to a particular product or process.

methods). Innovation thus requires a means of monitoring beyond the regular examination of R&D indicators.

While developed countries typically work on technological and information innovation because they have the available resources, developing countries, like the Philippines, tend to be users of technology. But, this does not prevent the developing world from using these innovations to tap available knowledge and technology for deployment and economic use in their respective societies. This entails initiating new activities throughout the economy, with the private sector being the main driver of innovation as it responds to client needs. In the innovation ecosystem, the role of government is to formulate policies and programs to encourage innovative behavior.

Firms face push factors, e.g., the need to remain competitive, and pull factors, e.g., the availability of talented skills at low cost, and size of the market to engage in innovation (Gonzales et al. 2010). Barriers to innovation in the country include the high cost of equipment and technology for innovation activities, as well as the lack of technical human resources/engineers. Micro, small, and medium enterprises (MSMEs) should especially venture into innovation in order to be more productive and competitive,³ but they often do not due to lack of the required financial capital (Llanto 2013).

Review of literature

Studies on innovative activities in the country have consistently echoed these issues. Nearly two decades ago, a survey of Filipino firms engaged in food processing, textile and garments, metals and metal fabrication, chemicals, and electronics and electrical goods was undertaken, with the results suggesting that most firms engaged in innovation were large firms with large assets (Macapanpan 1999). Further, many of these firms reported that the government was not an important factor in their conduct of innovation activities, and that government research institutions were poor sources of innovation ideas. Financial and human resource constraints were identified to be the main barriers to conducting

³ Llanto and del Prado (2015) analyzed the determinants of innovation activity and subsequently found that process innovation is positively associated with increase in sales, profit, and labor productivity. Using data for ASEAN member-states including the Philippines, Harvie et al. (2010) found that innovation is a vital determinant of SMEs' participation in global value chains because SMEs are able to meet the requirements of higher-tier firms through both product and process innovation.

innovation activities. Moreover, while the Philippine firms undertook product and process innovation, the linkages of these innovative firms with R&D institutions, such as universities and technology resource centers, and government agencies were weak (Macasaquit 2011). This should be a focus of attention as promoting more innovation activities, especially among MSMEs, entails linking knowledge generators and enterprise developers. These research findings throughout the years were further validated in Albert et al. (2013), which described results of the pilot 2009 Survey of Innovation Activities (SIA), conducted by the Department of Science and Technology in cooperation with the Philippine Institute for Development Studies (PIDS) and the then National Statistics Office.⁴ This study also provided a conceptual framework for measuring innovation in the country. Patalinghug (2003) and Ancog and Aquino (2007) provided descriptions of the structure and characteristics of the Philippine national innovation system. Meanwhile, STRIDE (2014) provided the most recent and rather comprehensive assessment of the innovation ecosystem in the country.

In an innovation ecosystem, firms and other economic agents develop new knowledge and transform it into new products, new processes, and new forms of organization, giving it economic value. Innovation may be supply pushed (based on new technological possibilities) or demand pulled (based on client needs and market requirements). Innovation results, however, depend not only on demand- and supply-side factors but also on the processes that link many different actors together in an innovation ecosystem. Institutions and policies may influence the innovative behavior of firms, or their lack of it.

Fostering innovation in Philippine business and industry is a challenge, given the constraints of scarce resources (including requisite RSEs), competing aims of public policy, as well as institutional issues. Quimba and Rosellon (2012) discussed on constraints in the local automotive industry regarding knowledge and technology transfer from their respective parent company units and other issues on weak network linkages. Meanwhile, Rosellon and Del Prado (2017a) explored the conduct of innovation without formal R&D in the case of three manufacturers in the garments industry. The authors found that without formal R&D, product and process innovation is still possible provided that

⁴ The National Statistics Office has been subsumed under the Philippine Statistics Authority by virtue of Philippine Statistical Act of 2013.

appropriately skilled personnel and a supporting mechanism exist in the company. In another paper, Rosellon and Del Prado (2017b) discovered that two firms in the food manufacturing industry demonstrated different drivers of innovation. The first firm had a strong partnership with its suppliers, supported by government and other innovation intermediaries, while the second firm—a large, locally owned, export-oriented enterprise—engaged in innovation activities driven by specific needs of its international customers. Despite the difference, both firms considered trade shows as important sources of knowledge and information. While Philippine transnational corporations, which are relatively larger companies with more resources, augment their production capabilities by working closely with companies in their production network, Ledda and Del Prado (2013) found that the firms' linkage with technology resource centers and government research institutions and universities was weak and lacked maturity. Linkages with government institutions and access to government support programs were also found to be critical for firms in the fruit juice processing industry to be able to upgrade their production process (Rosellon and Yasay 2012). While many studies have focused on innovation activities of individual firms, Serafica (2016), using the 2009 SIA, looked at service innovation across industries.

Innovation policy in the Philippines

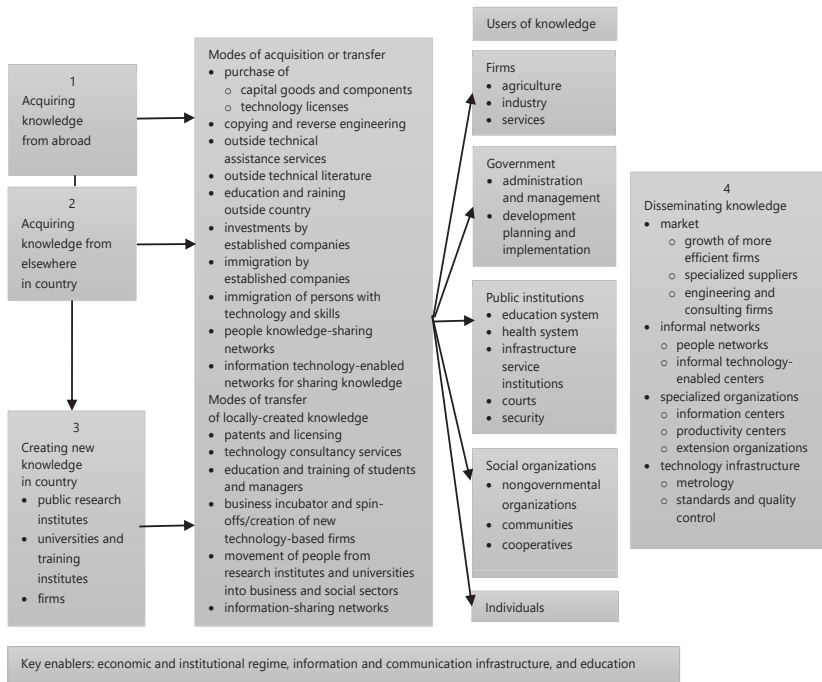
Critical to promoting innovation is innovation policy, which continues to be embedded within science and technology policy. In the Philippines, STI is merely viewed as providing a supporting role in the quest for economic and social development. Programs on STI have always been related to priority sectors in Philippine development plans, such as agriculture. Furthermore, STI plans, programs, and policies do not appear to have been provided with the required resources. There is currently a dearth of studies on the impact of STI plans and interventions, given the different thrusts across administrations (Ancog and Aquino 2007).

Innovation policy should eventually become mainstreamed into an overall strategy of continually transforming the country into a knowledge-based economy through concerted action in many different public policy arenas—including basic and higher education, trade and investment, agriculture, services, ICT, and finance. Stakeholders in both the public and private sectors need to have a clear understanding

of current innovation practices in Philippine business and industry to determine the best pathways for fostering innovative behavior.

The World Bank (WB) provides a handbook for developing countries to help nurture innovation policy and the innovation ecosystem. It describes the latter in terms of its actors, their roles, and the context (Figure 3) and offers a rather comprehensive view of innovation policy, in which the government is considered as a gardener who “prepares the ground” (i.e., building up the human resources needed to drive innovation forward); “fertilizes the soil” (i.e., boosting R&D and access to up-to-date information); “waters the plant” (i.e., assisting innovators by providing financial support and other measures to incentivize innovation); and “removes weeds and pests” (i.e., removing regulatory, institutional, or competitive obstacles to innovation) (WB 2010, p. 60).

Figure 3. Innovation ecosystem in developing countries



Source: World Bank (WB) (2010)

This paper utilizes the results of the 2015 SIA to determine the key factors that either encourage or inhibit innovation among local business firms in the country, and draw policy issues for promoting innovation into the mainstream of the Philippine business sector. Specifically, it intends to (1) present the results of the 2015 SIA conducted by the PIDS with the assistance of the Philippine Statistics Authority (PSA), establishing national benchmarks on various indicators of innovation activities; (2) identify the factors influencing innovative behavior in local firms; (3) determine the barriers and bottlenecks to innovation; (4) examine the effects of innovation on firms; and (5) utilize the empirical results of the survey in discussing policy issues that will foster and help mainstream innovation.

This paper is organized as follows: The next section presents the sampling scheme and the profile of establishments sampled for the 2015 SIA. The third section describes innovation activities engaged in by firms in the Philippines. The discussion also includes a description of wider forms of innovation. The fourth section describes the effects of innovation on firms, as well as sources of information and cooperation for innovation activities. The fifth section discusses the determinants of innovation, as well as the barriers and bottlenecks of innovative behavior among firms. The section also examines the factors that either drive or hinder innovation activities among establishments interviewed for both the 2015 SIA and the pilot 2009 SIA. The sixth section looks at available support for firms conducting innovation activities. The final section provides a summary of the key survey results and some key policy implications.

Sampling Scheme and Establishment Profile of 2015 SIA

Survey objectives and survey plan

Similar to the pilot 2009 SIA, the 2015 SIA aimed to generate information on the innovative behavior of establishments in the Philippines and determine the factors that drive their innovation performance. The specific objectives of the 2015 SIA were to

- 1) describe the types of innovation engaged in by firms;
- 2) provide information regarding the environments in which these innovative activities are conducted; and

- 3) determine the factors that drive firms' innovation performance, the barriers that hinder firms in engaging into innovative activities, and the effects of innovation on the firms.

The survey results discussed in this report are expected to serve as inputs for mainstreaming innovation policy in the country.

The major data items collected from 2015 SIA include (1) general information about the establishments, including economic activity, legal organization, economic organization, and the like; (2) capital participation by nationality of the stockholder; (3) employment by sex; (4) educational background of workers; (5) product innovation; (6) process innovation; (7) ongoing or abandoned innovation activities; (8) sources of information and cooperation for innovation activities; (9) effects of innovation activities; (10) factors hampering innovation activity; (11) intellectual property protection; (12) organizational innovation; (13) marketing innovation; (14) public sector procurement and innovation; (15) registration with investment promotion agencies; (16) knowledge management; and (17) government innovation-related policies.

The 2015 SIA utilized a stratified simple random sample design with the three-digit Philippine Standard Industry Classification as the industry strata. The three island groups, namely, Luzon, Visayas, and Mindanao, the Negros Island Region, the National Capital Region (NCR), and nine provinces (Pangasinan, Quezon, Camarines Sur, Iloilo, Cebu, Leyte, Zamboanga del Sur, Davao del Sur, and Sulu) served as geographic domains.

The 2015 SIA targeted 1,000 establishments for interview across the country, about half of which have been previously surveyed in the 2009 SIA. The survey covered four major industries: (1) food manufacturing, (2) other manufacturing, (3) ICT, and (4) business process outsourcing (BPO). In the sampling frame, nearly 30,000 (29,536) establishments were covered across the four major industries and across employment size categories (Table 1). This frame was extracted from the 2015 List of Establishments of the PSA, as of February 29, 2016. The latter categories cover micro, small, medium, and large establishments with employment size range of less than 50, 50–99, 100–199, and 200 and over, respectively.

Among the targeted establishments for interview, the PSA received 930 questionnaires from its field offices, of which 891 establishments have provided good reporting (thus yielding an effective nonresponse

Sampling Scheme and Establishment Profile of 2015 SIA

rate of 10.9%), while 35 establishments were reported as closed, moved out, or refused to accomplish the questionnaire. The distribution of the 891 responding establishments by major sector and by employment size category is shown in Table 2. The weighted percentages are noticeably quite close to the corresponding percentages in Table 1.

Table 1. Distribution of establishments in frame by industry and employment size

Major Industry Groups	Employment Size Category				Total
	Micro	Small	Medium	Large	
Food manufacturing	8,103 (27.4%)	4,148 (14.0%)	227 (0.8%)	245 (0.8%)	12,723 (43.1%)
Other manufacturing	3,419 (11.6%)	7,345 (24.9%)	676 (2.3%)	779 (2.6%)	12,219 (41.4%)
ICT	2,248 (7.6%)	1,317 (4.5%)	105 (0.4%)	123 (0.4%)	3,793 (12.8%)
BPO	105 (0.4%)	304 (1.0%)	67 (0.2%)	325 (1.1%)	801 (2.7%)
Total	13,875 (47.0%)	13,114 (44.4%)	1,075 (3.6%)	1,472 (5.0%)	29,536 (100.0%)

ICT = information and communication technology; BPO = business process outsourcing

Notes: Values in parentheses are weighted percentages.

Source: Philippine Institute for Development Studies (PIDS)(2015)

Table 2. Distribution of sample establishments in frame by industry and employment size

Major Industry Groups	Employment Size Category				Total
	Micro	Small	Medium	Large	
Food manufacturing	8,103 (27.4%)	4,148 (14.0%)	227 (0.8%)	245 (0.8%)	12,723 (43.1%)
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ICT = information and communication technology; BPO = business process outsourcing

Notes: Values in parentheses are weighted percentages.

Source: PIDS (2015)

Of the 891 establishments surveyed for the 2015 SIA, 232 were also interviewed in the 2009 SIA, forming panel data, thus enabling a comparative examination of the dynamics of innovation activities for the period 2009–2015, including identification of significant factors, both static and dynamic, that drive or prevent innovation in Philippine business and industry.

As in other establishment surveys, target respondents for the SIA were owners and managers of the sampled establishments. The reference period for the 2015 SIA was set for the calendar year 2015, although employment data were as of November 15, 2015. The survey was designed to be self-administered by the responding establishments. The 2015 SIA questionnaire (Appendix) slightly modified the questionnaire used in the 2009 SIA, which, in turn, had been adapted from the European Union’s Community Innovation Survey Version IV⁵. The modifications included additional questions about the educational background of workers, fiscal incentives given by investment promotion agencies, as well as innovation and public-sector procurement.

The PSA distributed and collected the 2015 SIA questionnaires from the middle of June 2016 to the end of May 2017. As is typical of surveys, pretests of the 2015 SIA instrument were conducted to determine the ease of understanding the questions. The PSA also conducted training activities on both field operations and data processing to ensure consistency in the collection of information from the respondent establishments, and uniformity in applying the data quality checks in data editing.

PSA staff performed manual editing and verification of the accomplished survey questionnaires before data entry. Completeness and consistency checks were also undertaken by the PSA. Data from the sampled establishments were weighted throughout this report by the authors to reflect the sampling frame. Survey weights were computed for all the firms based on the survey design and the information on the frame. For the panel data, however, no survey weights were computed, especially as the pilot innovation survey had a purposive survey design. PSA submitted the final microdata files to PIDS on May 23, 2017.

While there are several geographic domains according to the survey design, this report only provides aggregates for four major areas, viz., National Capital Region (NCR), Balance Luzon (i.e., Luzon without

⁵ <http://www.oecd.org/science/inno/40140021.pdf> (August 2, 2017)

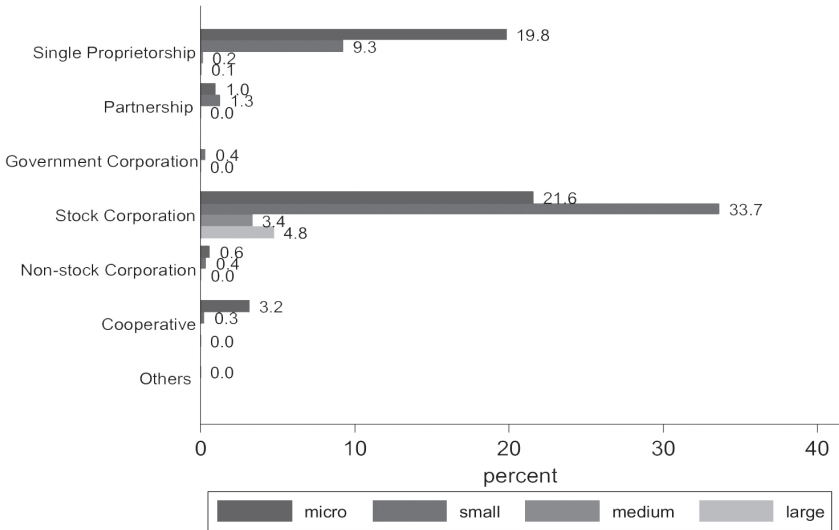
NCR), Visayas, and Mindanao since the precision of estimates cannot be assured for all the geographic domains. Similarly, henceforth the report shows aggregates for four major industry groups, namely food manufacturing, other manufacturing, ICT, and BPOs, rather than all the 38 industry strata as per survey design.

Results of the 2015 SIA should not be compared with those of the 2009 SIA, the latter being a pilot run, and only involved about 500 firms among four select study areas in three purposely-chosen industries likely to practice innovative behavior—food manufacturing, electronics manufacturing, and ICT. The 2015 SIA, on the other hand, was designed to be more nationally representative, with sampled firms chosen from four industries (food manufacturing, other manufacturing, ICT, and BPO), having twice the sample size of the 2009 SIA and targets for interview all of the 2009 SIA firms. In consequence, the results for the 2009 are merely descriptive of the responding firms, while those in 2015 may be inferred to a broader population of firms in the country.

General information about the targeted firms

About two thirds (63.4%) of establishments surveyed were stock corporations, and three-tenths (29.4%) were single proprietorships. Stock corporations get an increasing share as the employee size of the firm increases (Figure 4). Among micro establishments with fewer than 50 employees, slightly less than half (46.7%) were stock corporations (while the share of single proprietorships and cooperatives were 42.9% and 6.9%, respectively). For small firms that had 50 to 99 employees, three quarters (74.4%) were stock corporations (while a fifth were single proprietorships). For medium and large firms that had an employment size of 100 to 199, and 200 and above, respectively, nearly all (i.e. about 95 percent or more) were stock corporations.

Figure 4. Percentage distribution of establishments by size and legal organization

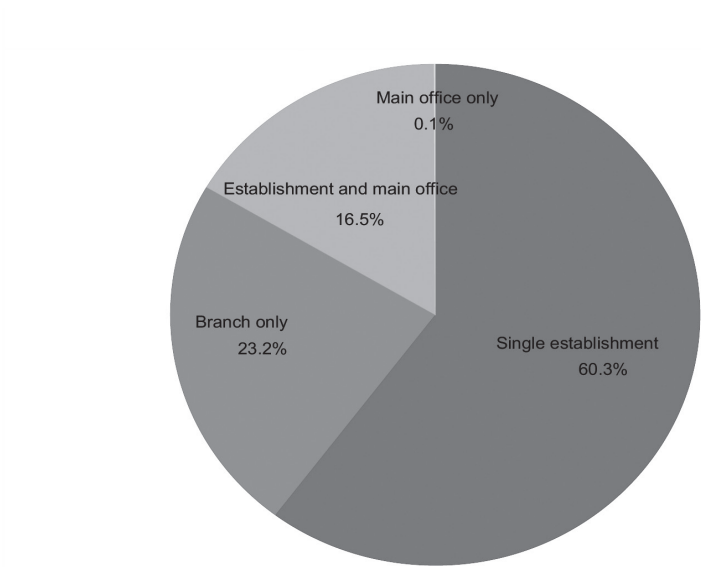


Source: PIDS (2015)

About three-fifths of the firms surveyed were single establishments (Figure 5), with the share of establishments that were single establishments varying by industry: food manufacturing (slightly over half), other manufacturing (about two-thirds), ICT (about three-fifths), and in BPOs (close to three-fourths).

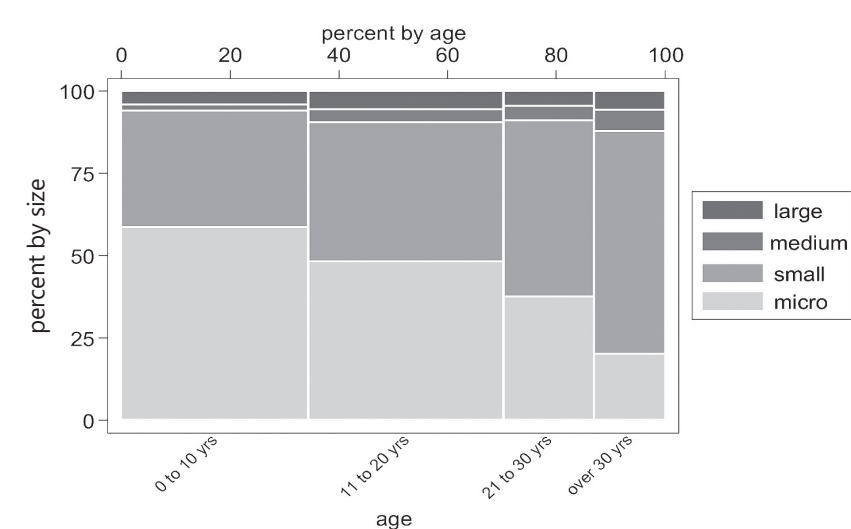
About 70.3 percent of firms were established during the past 20 years, about half of which were established in the last 10 years (Figure 6). Most (43.5%) of micro-sized firms were established in the past decade, while many small (33.7%), medium (38.6%), and large (40.9%) firms have been established after the last 10 but before the last 20 years.

Figure 5. Percentage distribution of establishments by economic organization



Source: PIDS (2015)

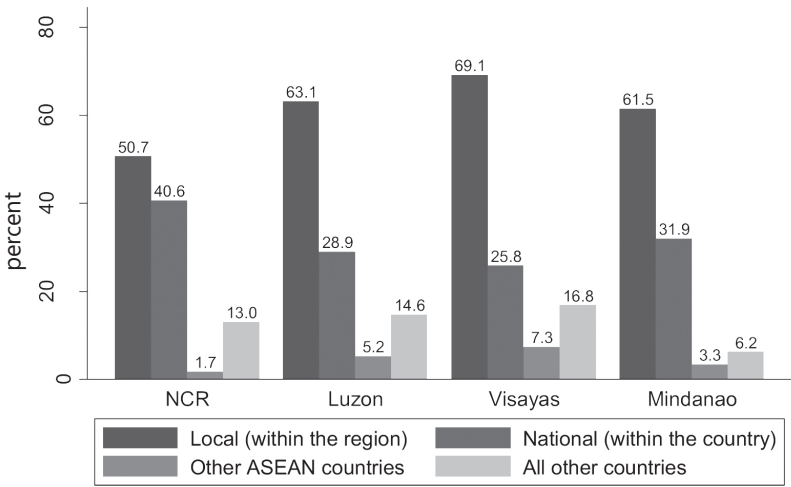
Figure 6. Distribution of establishments by age and size



Source: PIDS (2015)

Geographic markets that establishments sold goods or services to in 2015 varied by area (Figure 7). Overall, about three-fifths of the firms had local markets, a third had national markets, nearly 1 in 20 firms had markets in other ASEAN countries, while 3 in 20 had markets in countries outside ASEAN. Firms in Mindanao tended to cater less to international markets than those in Visayas and Luzon (outside NCR). Firms in NCR largely had less local markets but more national markets than establishments in Balance Luzon (i.e., Luzon outside NCR), Visayas, and Mindanao.

Figure 7. Percentage distribution of establishments, by area and geographic market



ASEAN = Association of Southeast Asian Nations
Source: PIDS (2015)

Sampling Scheme and Establishment Profile of 2015 SIA

As indicated in Table 3, the biggest concentration of capital/equity of firms was from local investors. Balance Luzon had the least average share of capital participation across the establishments among local investors at about 85.1 percent, with the Japanese having the biggest share of nonlocal investors at 7.5 percent. Metro Manila was next to Balance Luzon in having the least share of local investors at 87.0 percent; in the NCR, the biggest share of nonlocal capital participation was by the Americans (4.4%) and the Chinese (3.2%). In Visayas, local share of capital/equity of firms averaged to 89.6 percent, with the Taiwanese (3.3%) and Japanese (2.8%) having the largest share of capital participation.

Table 3. Capital participation share across nationalities, by size of establishment and major area

Employment Size Category	Nationality	Major Area				Philippines
		NCR	LUZ	VIS	MIN	
Micro	Filipino	90.6	98.4	98.3	98.4	96.5
	American	0.7	0.0	0.0	0.0	0.2
	British	0.4	0.0	0.0	0.0	0.1
	Chinese	8.0	1.2	0.0	0.0	2.3
	German	0.0	0.0	0.0	1.6	0.3
	Japanese	0.1	0.1	0.6	0.0	0.2
	Korean	0.1	0.0	0.3	0.0	0.1
	Singaporean	0.0	0.0	0.0	0.0	0.0
	Taiwanese	0.0	0.0	0.8	0.0	0.2
	Others	0.1	0.2	0.0	0.0	0.1
Small	Filipino	88.1	81.9	83.5	95.6	86.3
	American	4.9	4.1	1.4	0.2	3.5
	British	0.0	0.0	0.8	0.0	0.1
	Chinese	0.4	0.8	0.5	0.0	0.5
	German	0.0	0.0	0.0	0.0	0.0
	Japanese	0.6	11.3	4.4	0.0	4.6
	Korean	0.0	1.1	0.0	0.9	0.5
	Singaporean	0.4	0.0	0.0	0.0	0.2
	Taiwanese	1.5	0.3	7.3	0.5	1.8
	Others	4.1	0.5	2.0	2.8	2.4

NCR = National Capital Region; LUZ = Luzon; VIS = Visayas; MIN = Mindanao

Source: PIDS (2015)

Table 3. (continued)

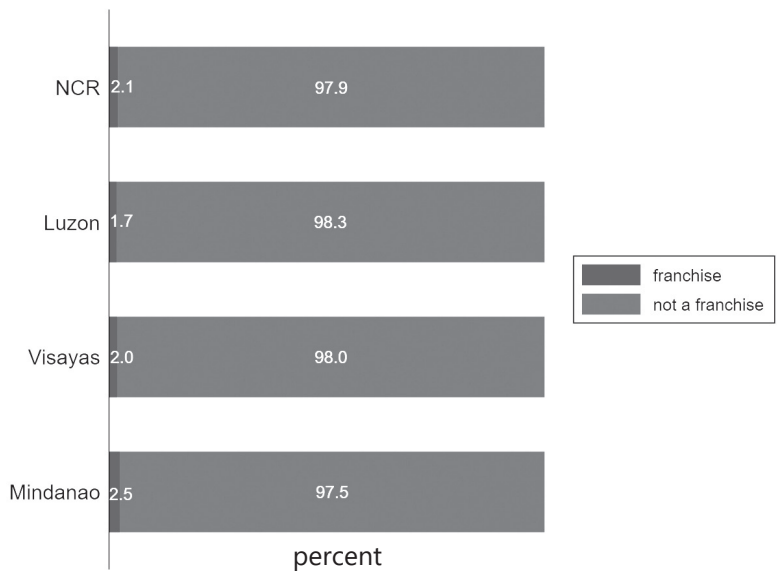
Employment Size Category	Nationality	Major Area				Philippines
		NCR	LUZ	VIS	MIN	
Medium	Filipino	82.5	59.2	60.4	70.8	70.1
	American	7.4	1.0	13.6	0.0	5.1
	British	0.6	0.0	0.0	0.0	0.2
	Chinese	4.9	0.1	4.2	7.3	3.3
	German	0.0	0.0	0.0	0.0	0.0
	Japanese	1.5	22.8	11.5	21.9	12.5
	Korean	0.1	6.0	0.0	0.0	2.3
	Singaporean	0.2	0.0	0.0	0.0	0.1
	Taiwanese	0.0	4.6	0.0	0.0	1.7
	Others	2.8	6.2	10.3	0.0	4.8
	Filipino	58.5	23.4	34.4	87.7	41.0
Large	American	19.7	9.0	10.3	0.0	12.7
	British	2.0	2.5	3.0	0.0	2.3
	Chinese	0.0	8.9	8.4	0.0	5.2
	German	1.2	4.9	9.1	0.0	3.9
	Japanese	1.0	26.3	15.0	6.3	14.4
	Korean	3.1	14.2	0.0	0.0	7.3
	Singaporean	4.6	1.4	0.0	0.0	2.3
	Taiwanese	0.0	3.4	5.1	0.0	2.2
	Others	9.9	5.9	14.7	5.9	8.7
	Filipino	87.0	85.1	89.6	96.6	88.2
	American	4.4	2.4	1.2	0.1	2.5
All sizes	British	0.3	0.2	0.4	0.0	0.2
	Chinese	3.2	1.5	0.6	0.2	1.7
	German	0.1	0.3	0.4	0.9	0.3
	Japanese	0.5	7.5	2.8	0.6	3.3
	Korean	0.2	1.6	0.2	0.4	0.7
	Singaporean	0.5	0.1	0.0	0.0	0.2
	Taiwanese	0.8	0.5	3.3	0.2	1.1
	Others	3.0	0.9	1.5	1.2	1.7

NCR = National Capital Region; LUZ = Luzon; VIS = Visayas; MIN = Mindanao
Source: PIDS (2015)

Among micro establishments, capital participation came nearly entirely (96.5%) from local investors. Among small establishments, local investors still dominated capital participation, but across areas, the distribution varied, with Filipinos having a range of 81.9 percent (in Balance Luzon) to 95.6 percent of capital in Mindanao. Among medium establishments, the dominant investors were Filipinos, Japanese, and Americans, with the Japanese outranking Americans in Balance Luzon and Mindanao at about 20 percent capital participation as against 1 percent or less for the Americans; while the Americans had similar shares to the Japanese in the Visayas, and had more substantial share than the Japanese in Metro Manila. Among large firms, Filipinos had an average of 41.0 percent share of capital, with both the Japanese (14.4%) and Americans (12.7%) at over 10 percent, across all areas. For large firms, Japanese (26.3%) even had a higher capital share in Balance Luzon than Filipinos (23.4%); Americans had 17.7 percent capital shares in Metro Manila (where Filipinos had 58.5% share); in the Visayas, capital shares were about 10 percent or over from the Japanese, Americans, Germans, and Chinese (Filipinos had 34.4 % share), while in Mindanao where Filipinos had the largest share at 87.7 percent, the Japanese had 6.3 percent capital share among large firms.

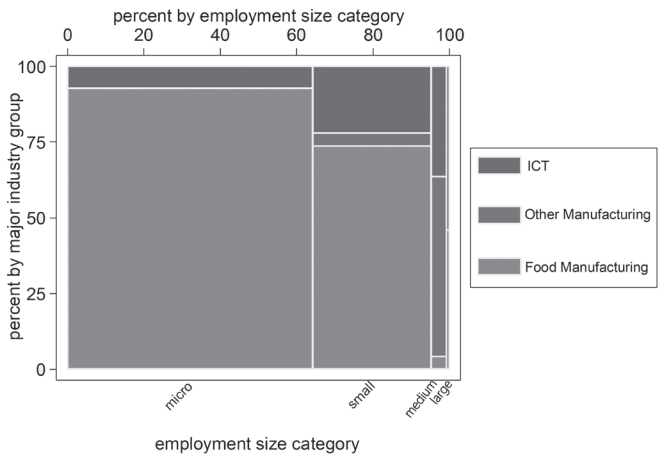
Franchising was rare, with only 2 percent of establishments being franchises, and with the rate roughly similar across areas (Figure 8). Franchises tended to be concentrated in the food manufacturing industry, which had fourth-fifths (82.9%) of all franchises, of which 71.8 percent and 27.6 percent, respectively, were micro and small establishments (Figure 9). A tenth (12.8%) of franchise firms was in ICT, of which half (53.3%) and a third (35.5%) were small and micro establishments, respectively.

Figure 8. Percentage of establishments that are franchises, by area



Source: PIDS (2015)

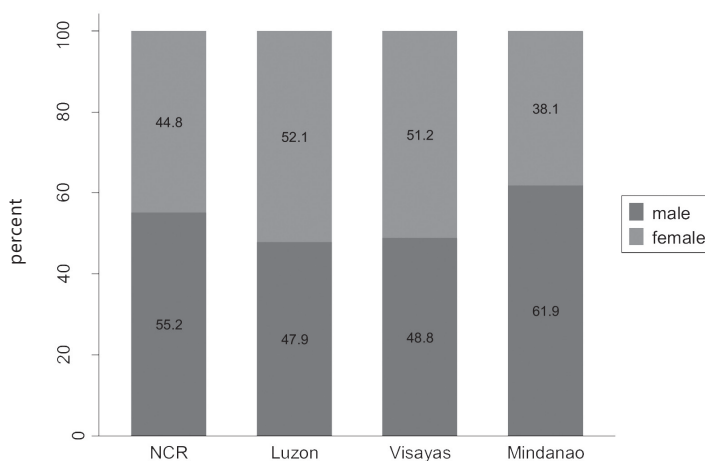
Figure 9. Percentage of franchised establishments, by industry and employment size



ICT = information and communication technology
Source: PIDS (2015)

Overall, the female share of employment among establishments was about half (48.2%) across the country, with the percentage of women among employees in major areas ranging from 35.7 percent in Mindanao to 45.3 percent in Balance Luzon (Figure 10).

Figure 10. Share of employment in establishments, by sex and area



NCR = National Capital Region

Source: PIDS (2015)

Significant variations in the labor share of women were observed across establishment size and major industry (Table 4). Among BPO establishments, 55.2 percent of total employees were female, with micro and medium-sized BPO firms having a female share of employment of more than 70 percent, while small- and large-sized BPO establishments had women occupying less than 60 percent but more than half of their workforce. Establishments engaged in food manufacturing employed substantially fewer females than males (less than two-fifths female share of employment, especially among micro, medium, and larger firms). Large establishments engaged in other manufacturing had about three-fifths of females among their total employment. ICT firms also had their female share to total employment at around two-fifths.

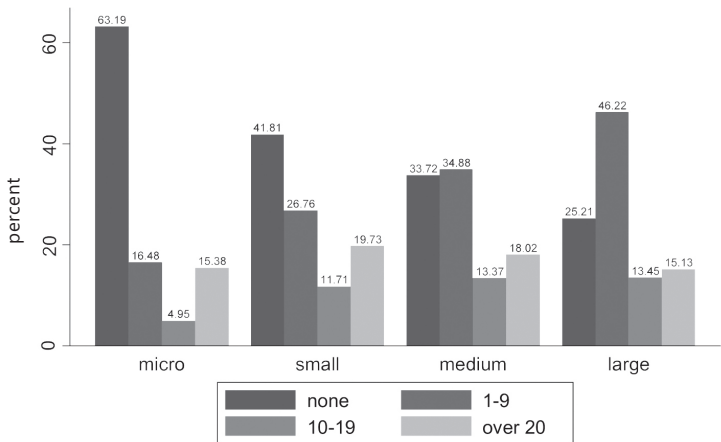
Table 4. Female share to total employment, by industry and employment size

Major Industry	Employment Size (%)				Total
	Micro	Small	Medium	Large	
Food Manufacturing	38.3	40.4	35.9	29.1	35.7
Other Manufacturing	33.7	34.6	36.0	60.0	49.5
ICT	40.0	34.6	41.0	46.0	43.3
BPO	75.6	59.2	72.3	54.8	55.2
All Industries	38.0	36.9	38.7	53.5	48.2

ICT = information and communication technology; BPO = business process outsourcing
Source: PIDS (2015)

About two thirds (57.5%) of establishments had no employees with postbaccalaureate degrees, from a low of 25.2 percent among large establishments to as high as 63.2 percent among micro-sized firms (Figure 11).

Figure 11. Percentage of establishments that have employees with a postbaccalaureate degree, by employment size



Source: PIDS (2015)

Innovation Activity in Philippine Business and Industry

The 2015 SIA surveyed establishments to probe on their activities, the level of effort employed, and the achievement of new or improved products and/or processes. In this report, establishments are defined as innovation-active if they are

- (a) product innovators that introduced new or significantly improved products, i.e., goods and/or services;
- (b) process innovators that introduced (i) new or significantly improved methods of manufacturing or producing goods or services; (ii) new or significantly improved logistics, delivery or distribution methods for inputs, goods, and services; (iii) new or significantly improved supporting activities for processes, such as maintenance systems or operations for purchasing, accounting, or computing;
- (c) engaged in innovation projects either not yet complete or abandoned; and/or
- (d) engaged in expenditure of innovation activities for (i) internal or outsourced R&D; (ii) training; (iii) acquisition of external knowledge machinery, equipment or software linked to innovation activities; (iv) market introduction of innovations; and (v) other preparations to implement innovations.

Tables 5, 6, and 7 provide key statistics on innovation activity in 2015 by size, major sector, and area, respectively. Overall, about two-fifths (42.9%) of establishments in the country were innovation-active in 2015 (Table 5). Large establishments were more likely to conduct innovation, with about two-thirds (63.0%) being innovation-active, as compared to a third among micro-sized firms (33.9%), and about half for small (49.6%) and medium (46.1%) establishments. Across the country, about 3 in 10 (30.7%) establishments were product innovators (30.7%), and this rate is similar to the proportions of process innovators (30.6%). Of those establishments that had product innovations, a bigger share also were process innovators. Among establishments that had process innovations, a smaller share of these firms had process innovations alone. About 1 in 10 establishments (9.2%) have had projects to develop product or process innovations that had to be abandoned in 2015, while about 3 out of 10 firms (30.3%) had innovation projects that were ongoing up to the end of 2015. The larger

the firm size, the more likely it innovates. Even average expenditures in innovation activities tend to rise with the size of establishments. On average, firms spent PHP 2.9 million in 2015 on innovation activities while large firms spent 10 times (PHP 30.5 million) more than the average spending of all establishments. In relation to total sales, this spending on innovation represented only less than 5 percent of total gross sales, whereas micro-sized establishments spent, on average, about PHP 208,000 on innovation activities in 2015, which represented about 9.8 percent of their total gross sales on innovation activities. Only 1 in 30 (3.1%) establishments mentioned public support for its innovations, with the rate higher among small-sized and large firms than micro and medium-size ones. For wider forms of innovation, organizational innovation was practiced by a third (33.5%) of micro-sized firms and as much as half (53.1%) of large firms. Similarly, a bigger share of large firms (43.3%) than micro-sized firms (37.2%) conducted marketing innovation. Overall, two-fifth (18.4%) had some awareness of any government innovation policy or intervention, with a bigger share among large (29.9%) firms being aware of innovation policy than among SMEs (17.8%). More than two-fifths (42.5%) of firms practiced knowledge management, especially medium (58.8%) and large (64.4%) firms.

Table 5. Key statistics on innovation activity by size of establishments

Innovation Activity	Proportion (%)				All Firms
	Micro	Small	Medium	Large	
Innovation active	33.9	49.6	46.1	63.0	42.9
Product innovators	26.8	33.7	30.0	39.3	30.7
Share with new-to-market products	18.8	22.7	18.6	23.0	20.8
Process innovations	22.9	36.5	35.7	46.8	30.6
Share of those that developed process innovation within the establishment or enterprise	22.1	36.2	34.4	44.1	30.0

Source: PIDS (2015)

Innovation Activity in Philippine Business and Industry

Table 5. (continued)

Innovation Activity	Proportion (%)				All Firms
	Micro	Small	Medium	Large	
Both product and process innovators	21.1	26.8	26.6	34.0	24.5
Either product or process innovator	28.6	43.4	39.0	52.1	36.8
Ongoing innovation activities	19.7	38.4	36.3	50.7	30.3
Abandoned innovation activities	8.4	9.8	5.3	15.5	9.2
Innovation-related expenditure	21.4	30.2	29.3	43.4	26.7
Memo Notes:					
Average annual expenditures for innovation activities (in '000 PHP)	208.6	2392.2	7547.4	30494.0	2935.8
Proportion of expenditure on innovation from total gross sales	9.8	2.8	1.6	2.9	5.6
Public financial support for innovation	1.4	4.9	1.2	3.7	3.1
Innovation cooperation	11.8	23.1	20.4	20.1	17.6
Organizational innovations	33.5	39.6	41.4	53.1	37.5
Memo Notes:					
Average percentage of employees affected by establishment's organizational innovations	59.5	49.0	46.9	54.6	53.7
Marketing innovators	37.2	38.7	36.3	43.3	38.1

Source: PIDS (2015)

Table 5. (continued)

Innovation Activity	Proportion (%)				All Firms
	Micro	Small	Medium	Large	
With knowledge management practices	34.8	46.7	58.8	64.4	42.5
Aware of any government innovation policy or intervention	15.1	20.1	25.1	29.9	18.4

Source: PIDS (2015)

Across industries, establishments in ICT and manufacturing of goods other than food were the most innovation-active, with a rate of 45 percent or higher (Table 6). In addition, average expenditures in innovation activities in 2015 for both ICT and manufacturing firms were at around PHP 4 million while innovation-active BPO firms spent more at PHP 12.5 million in 2015. Nearly half (47.9%) of firms in ICT were also marketing innovators, compared to less than a fifth (16.0%) in BPO.

Table 6. Key statistics on innovation activity by industry

Innovation Activity	Proportion (%)				All Industries
	Food Mfg.	Other Mfg.	ICT	BPOs	
Innovation active	34.6	46.7	56.9	33.6	42.9
Product innovators	24.4	35.2	38.3	13.4	30.7
Share with new-to-market products	21.0	20.7	22.7	6.8	20.8
Process innovations	27.0	37.2	25.8	9.9	30.6

Mfg. = manufacturing, ICT = information and communications technology; BPO = business process outsourcing

Source: PIDS (2015)

Innovation Activity in Philippine Business and Industry

Table 6. (continued)

Innovation Activity	Proportion (%)				
	Food Mfg.	Other Mfg.	ICT	BPOs	All Industries
Share of those that developed process innovation within the establishment or enterprise	26.6	36.1	25.3	9.9	30.0
Both product and process innovators	22.7	29.7	17.3	9.9	24.5
Either product or process innovator	28.7	42.8	46.8	13.4	36.8
Ongoing innovation activities	26.7	32.1	36.1%	26.2	30.3
Abandoned innovation activities	8.6	9.7	10.5	4.2	9.2
Innovation-related expenditure	26.3	24.1	35.7	26.7	26.7
Memo Notes:					
Average annual expenditures for innovation activities (in '000 PHP)	855.3	4185.2	3724.1	12462.1	2935.8
Proportion of expenditure on innovation from total gross sales	4.7	2.6	15.6	2.7	5.6
Public financial support for innovation	2.0	3.9	4.0	2.3	3.1
Innovation cooperation	12.9	20.8	21.7	18.6	17.6
Organizational innovations	34.0	38.6	47.2	20.5	37.5

Mfg. = manufacturing, ICT = information and communications technology; BPO = business process outsourcing
Source: PIDS (2015)

Table 6. (continued)

Innovation Activity	Proportion (%)				
	Food Mfg.	Other Mfg.	ICT	BPOs	All Industries
Memo Notes:					
Average percentage of employees affected by establishment's organizational innovations	55.2	48.3	62.0	66.5	53.7
Marketing innovators	37.5	36.7	47.9	16.0	38.1
With knowledge management practices	43.6	37.9	49.9	58.5	42.5
Aware of any government innovation policy or intervention	18.1	15.2	30.1	9.5	18.4

Mfg. = manufacturing, ICT = information and communications technology; BPO = business process outsourcing
Source: PIDS (2015)

Among major areas in the country, Mindanao and NCR had the biggest share of firms that were innovation-active, with a rate of 45 percent or above (Table 7).

Innovation Activity in Philippine Business and Industry

Table 7. Key statistics on innovation activity by area

Innovation Activity	Proportion (%)				
	NCR	Balance Luzon	Visayas	Mindanao	All Areas
Innovation active	46.7	39.4	36.6	50.2	42.9
Product innovators	31.8	30.1	27.5	33.4	30.7
Share with new-to-market products	24.4	17.5	19.1	22.5	20.8
Process innovations	28.5	28.8	31.9	38.2	30.6
Share of those that developed process innovation within the establishment or enterprise	28.4	27.7	31.8	36.3	30.0
Both product and process innovators	21.0	24.8	25.2	30.5	24.5
Either product or process innovator	39.4	34.0	34.3	41.0	36.8
Ongoing innovation activities	33.8	25.9	21.4	43.9	30.3
Abandoned innovation activities	6.9	14.5	6.7	5.1	9.2
Innovation-related expenditure	30.7	24.8	15.0	36.8	26.7
Memo Notes:					
Average annual expenditures for innovation activities (in '000 PHP)	3609.646	3883.179	1868.192	579.2567	2935.826

NCR = National Capital Region
Source: PIDS (2015)

Measuring and Examining Innovation in Philippine Business and Industry

Table 7. (continued)

Innovation Activity	Proportion (%)				
	NCR	Balance Luzon	Visayas	Mindanao	All Areas
Proportion of expenditure on innovation from total gross sales	7.4	5.4	4.8	2.9	5.6
Public financial support for innovation	0.6	3.8	6.3	3.0	3.1
Innovation cooperation	21.3	9.4	19.4	26.4	17.6
Organizational innovations	33.5	37.2	40.6	43.1	37.5
Memo Notes:					
Average percentage of employees affected by establishment's organizational innovations	52.7	46.6	65.3	57.2	53.7
Marketing innovators	33.9	34.6	49.2	41.8	38.1
With knowledge management practices	42.1	37.4	43.4	53.9	42.5
Aware of any government innovation policy or intervention	14.1	15.4	30.9	19.7	18.4

NCR = National Capital Region

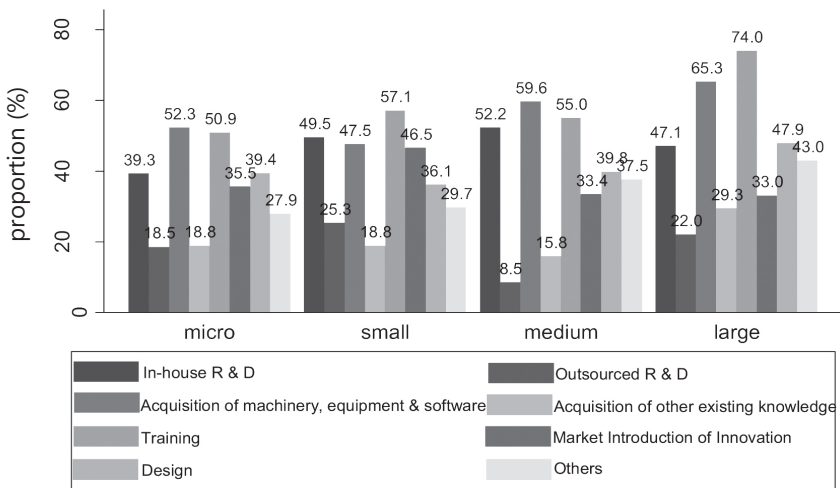
Source: PIDS (2015)

Mindanao also had the biggest share of firms with knowledge management (53.9%), though it had the least expenditure for innovation in both levels (PHP 580,000) and in relative terms (2.9% of gross sales). While Visayas had the least proportion of firms that were innovation active at 36.6 percent and the least proportion of product innovators (at 27.5%), it has the biggest share of firms with public financial support for innovation (6.3%). It also had the largest percentage of firms at 49.2 percent that were marketing innovators as well as the biggest proportion

of establishments at 30.9 percent that were aware of any government innovation policy or intervention across areas.

In 2015, a quarter (26.7%) of establishments had some innovation-related expenditure (Figure 12). Among these firms, the most commonly reported activities were in investment in internal or external training activities for the development and/or introduction of new products or processes. This was followed by acquisition of machinery, equipment, or software. Both these activities were undertaken by more than half of the innovative firms. For large firms, more than two-fifths (43.4%) spent on innovation activities. Half (47.1%) of these large innovative firms undertook in-house R&D. As much as three-fourths (74.0%) of large innovative firms spent on training, while about two-thirds (65.3%) spent on either machinery, equipment, or software. The bulk of these acquisitions were machinery. Half (47.9%) of large firms spent on in-house or subcontracted activities to design or alter the shape or appearance of goods or services.

Figure 12. Proportion of establishments that spent on various innovation-related activities, by activity and size of establishment

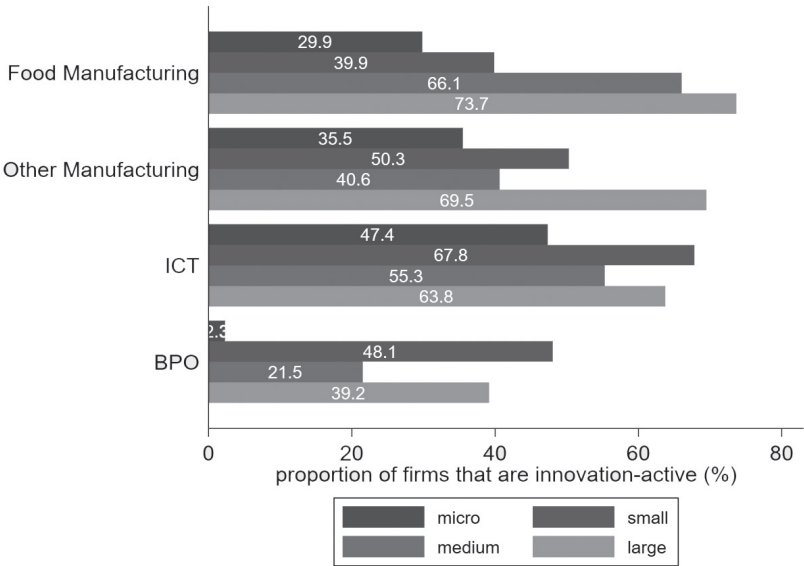


R&D = research and development

Source: PIDS (2015)

As shown in Figure 13, the share of firms that were innovation active varied considerably across industry groups, with large firms tending to be more innovation active than small firms. In manufacturing, whether food manufacturing or other manufacturing, about two-fifths (40.7%) of firms were innovation active, but only less than a third (31.6%) of micro-sized firms are innovation active, while among small and medium-sized firms, half were innovation active, and 70.5 percent of large firms were innovation active. Among ICT firms where more than half (56.9%) were innovation active, half of micro-sized firms were innovation active, compared to two-thirds of small, medium, and large establishments that were innovation active.

Figure 13. Proportion of establishments that are innovation-active by industry and by size of establishment



ICT = information and communications technology; BPO = business process outsourcing
Source: PIDS (2015)

In 2015, a third (34.9%) of innovation-active firms filed for intellectual property rights (IPRs), especially in claiming a brand name or registering a trademark (Table 8). The filing of IPRs was five to more than 20 times higher among innovation-active establishments than among firms that did not innovate.

Table 8. Percentage of establishments that filed for Intellectual Property Rights, by innovation activity status

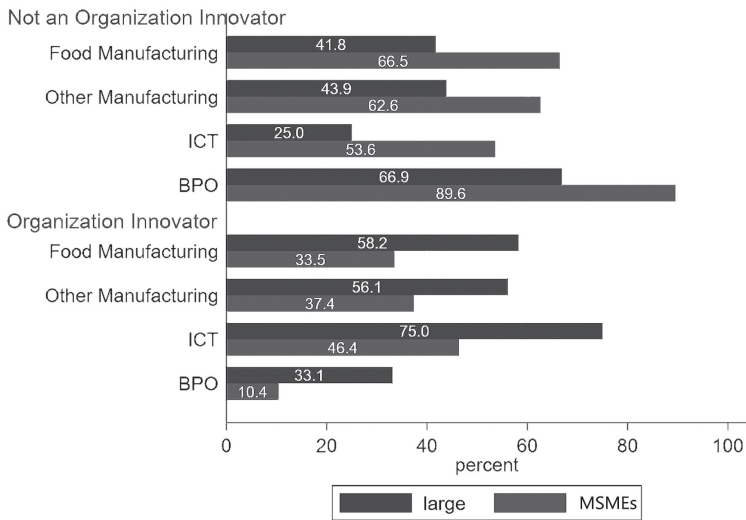
Intellectual Property Rights	Percentage (%)		
	Innovators	Noninnovators	All Firms
Applied for patent	12.1	1.5	6.0
Registered trademark	19.5	4.3	10.8
Claimed copyright	10.0	0.5	4.6
Registered utility model	8.8	0.4	4.0
Registered design	9.7	1.8	5.2
Claimed brand name	26.7	5.5	14.6
At least one form of Intellectual Property Right	34.9	9.0	20.1

Source: PIDS (2015)

Innovation involves the development or use of technology or other forms of product or process change. A wide sense of innovation comprises implementation of organizational innovation (which comprises new organizational approaches in business practices, workplace organization, or external relations) or marketing innovation (i.e., the implementation of a new marketing method involving significant changes in product design or packaging product placement, product promotion, or pricing). Often, a wider form of innovation is implemented in conjunction with product or process innovation, but also as an independent means of improving competitiveness and productivity. As might be expected, a greater proportion (53.7%) of large firms compared to MSMEs (36.7%) engaged in organizational changes (Figure 14).

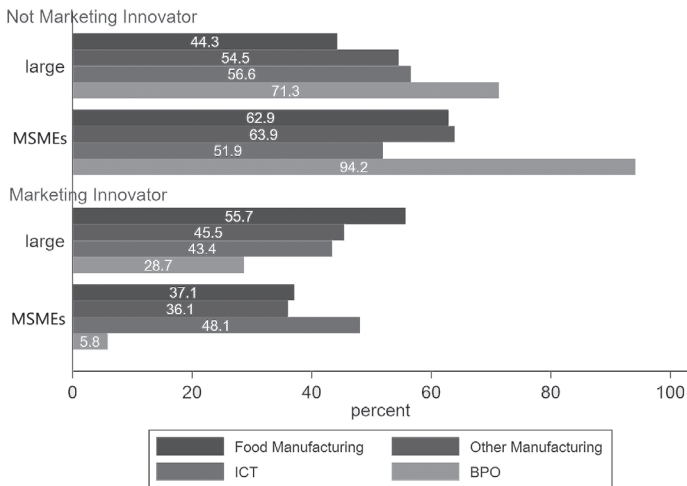
Across major industries, the difference between the rates of MSMEs and large establishments that introduced organizational innovation was largest in ICT firms at 28.6 percentage points. As regards marketing innovation, about two-fifths (38.9%) of establishments engaged in marketing innovation, with large-size firms in food manufacturing (55.7%) taking the lead, while MSMEs in the BPO industry (5.8%) having the lowest rate of marketing innovation (Figure 15).

Figure 14. Proportion of organizational innovation among MSMEs and large establishments, by industry and organizational innovation status



MSME = micro, small, and medium enterprises; ICT = information and communications technology; BPO = business process outsourcing
Source: PIDS (2015)

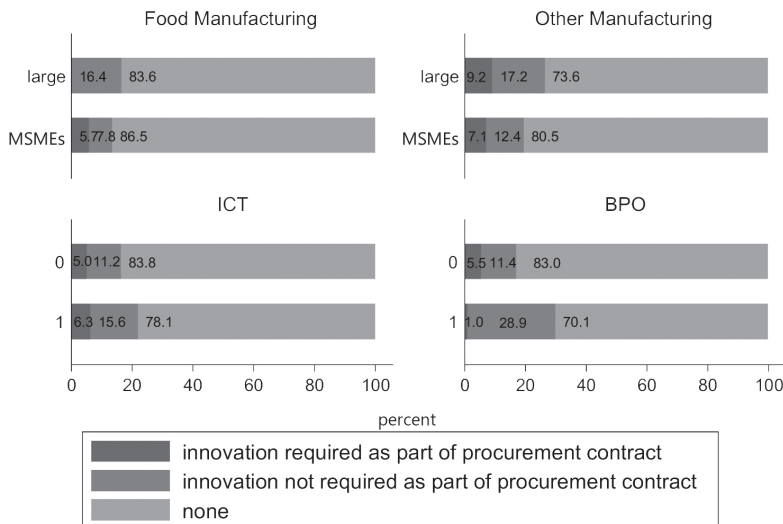
Figure 15. Proportion of establishments across industry by size and marketing innovation status



MSMEs = micro, small, and medium enterprises; ICT = information and communications technology; BPO = business process outsourcing
Source: PIDS (2015)

In 2015, about a fifth (17.4%) of establishments undertook innovation (product, process, marketing, or organizational) as part of a procurement contract to provide goods and services to a public sector organization, of which a third (35.7%) did so to fulfill the requirement of the procurement contract. Among BPO firms, as much as a quarter (23.7%) engaged in innovation as part of a government procurement contract, although the bulk of these innovation activities (87.8%) were not required by the contract (Figure 16). On the other hand, only 13.3 percent of food manufacturing establishments had innovation activities arising from government contracts, but as much as two-fifths (41.2%) of which required innovation as part of the procurement contract.

Figure 16. Proportion of MSMEs and large establishments that undertook innovation activities as part of a procurement contract to provide goods or services to a public sector organization, by industry



MSMEs = micro, small, and medium enterprises; ICT = information and communications technology; BPO = business process outsourcing
 Source: PIDS (2015)

Effects and Sources of Innovation

As in the pilot 2009 SIA, the 2015 SIA sought information about the perceived effects of product and process innovation on firms. Respondents were asked to rank a number of likely effects of innovation on a scale from ‘not relevant’ (4), to ‘low’ (3), ‘medium’ (2), or ‘high’ (1) perceived effects. Table 9 provides the percentage of innovation-active firms that answered ‘high’ in each category. Perceived effects among organizational innovators and marketing innovators are found in Tables 10 and 11, respectively.

Perceived effects of product and process innovation varied across industry and size of firms (Table 9). Among MSMEs in food manufacturing, half of innovators gave a “high” rating on the product innovation effect in terms of increasing the range of goods and services, while half of establishments engaged in manufacturing goods other than food gave a “high” rating on the effect of product innovation on improved quality of goods or services. Also, half of MSMEs in ICT rated “high” all product innovation effects. Among large-sized firms engaged in BPO, four-fifths also rated highly all product innovation effects, while nearly all gave a “high” rating on process innovation effects to include improved flexibility of production or service provision, and increased capacity of production or service provision. Only 1 in 20 MSMEs in ICT gave the rating of “high” to the effects of process innovations in terms of reduced materials and energy per unit output. A similar low proportion of MSMEs in ICT rated innovation effects highly in terms of reduced environmental impacts or improved health and safety, as well as meeting regulatory requirements.

Table 9. Proportion of innovation-active establishments that rated effects of product and process innovation as 'high', by major sector and size of firm

Perceived Effects of Product and Process Innovation	Proportion (%)											
	Food Manufacturing			Other Manufacturing			ICT			BPO		
	MSME	Large	All firms	MSME	Large	All firms	MSME	Large	All firms	MSME	Large	All firms
Product oriented effects	Increased range of goods or services											
	50.9	38.3	38.7	37.9	42.5	42.2	46.0	32.9	33.4	51.6	81.5	56.6
										43.1	39.4	39.6
Product oriented effects	Entered new markets or increased market share											
	27.0	28.6	28.6	24.8	32.5	31.9	46.0	19.7	20.7	30.7	81.5	39.2
										28.4	28.9	28.9
Product oriented effects	Improved quality of goods or services											
	36.9	29.1	29.4	49.4	51.0	50.9	46.0	28.7	29.3	30.7	81.5	39.2
										44.1	39.5	39.8
Process oriented effects	Improved flexibility of production or service provision											
	31.4	20.9	21.4	42.6	36.0	36.6	5.5	28.4	27.7	46.5	97.4	71.0
										37.7	29.9	30.4
Process oriented effects	Increased capacity of production or service provision											
	35.5	32.3	32.4	45.6	32.2	33.4	34.7	26.7	27.0	44.5	97.4	69.9
										42.6	31.7	32.5

MSMEs = micro, small, and medium enterprises; ICT = information and communications technology; BPO = business process outsourcing
Source: PIDS (2015)

Table 9. (continued)

Perceived Effects of Product and Process Innovation	Proportion (%)											
	Food Manufacturing			Other Manufacturing			ICT			BPO		
	MSME	Large	All firms	MSME	Large	All firms	MSME	Large	All firms	MSME	Large	All firms
Process oriented effects	Reduced labor costs per unit output	26.3	15.9	16.3	33.2	16.7	18.2	34.7	21.6	44.5	11.4	28.6
												18.5
Process oriented effects	Reduced materials and energy per unit output	18.3	19.4	19.4	31.2	19.0	20.1	5.5	13.1	40.2	11.4	26.4
												18.6
Other effects	Reduced environmental impacts or improved health and safety	26.3	17.0	17.4	40.2	21.7	23.4	5.5	16.3	40.2	11.4	26.4
												20.0
Met regulatory requirements		34.2	21.7	22.2	44.9	24.8	26.7	6.1	18.7	44.5	11.4	28.6
												23.6

MSMEs = micro, small, and medium enterprises; ICT = information and communications technology; BPO = business process outsourcing
Source: PIDS (2015)

Similarly, the perceived effects of organizational innovation (Table 10) and those of marketing innovation (Table 11), according to their corresponding innovators, varied across industry and size of firms. While about two-thirds or more of firms in food manufacturing, ICT, and BPO, regardless of size, highly perceived the effect of organizational innovation on improved quality of goods or services, among other manufacturing establishments, this was highly regarded by two-thirds of MSMEs but only a third of large firms. Half of MSMEs in food manufacturing, three-fifths of ICT firms, and four-fifths of large firms in ICT also highly viewed organizational innovation as affecting improved employee satisfaction and/or lowered employee turnover. Half of MSMEs in food manufacturing and two thirds of MSMEs in BPO highly considered organizational innovation as affecting increased ability to develop new products or processes. Three-fifths of large firms in ICT, half of large firms in BPOs, and about half of firms in food manufacturing (regardless of size) highly considered improved communication or information sharing as an effect of organizational innovation.

As regards marketing innovators, about half or more of food manufacturing firms (regardless of size), about three-quarters of large firms in BPO, and more than half of large ICT firms had a high regard for all identified effects of marketing innovations (sales growth for their goods and services; increased visibility of products or business; reduced costs per unit output; improved customer satisfaction). Only less than a fifth of MSMEs in ICT highly viewed the effect of marketing innovation in sales growth for its goods and services; reduced costs per unit output; and improved customer satisfaction.

Table 10. Percentage of organizational innovators that rate effects of organizational innovation as ‘high’ by major sector and size of firm

Perceived Effects of Organizational Innovation	(%)											
	Food Manufacturing			Other Manufacturing			ICT			BPO		
	MSME	Large	All firms	MSME	Large	All firms	MSME	Large	All firms	MSME	Large	All firms
Reduced time to respond to customer or supplier needs	46.0	32.9	33.3	43.5	22.5	24.5	41.4	39.9	40.0	63.3	34.3	55.1
Improved quality of goods or services	58.4	66.9	66.7	65.7	37.8	40.4	62.2	67.1	66.9	63.3	88.0	70.3
Reduced costs per unit output	54.8	34.1	34.8	33.3	24.5	25.3	41.4	33.0	33.4	36.7	34.3	36.0
Improved employee satisfaction and/or lower employee turnover	50.0	42.2	42.4	33.0	24.3	25.1	55.6	57.5	57.4	20.9	83.1	38.4
Improved communication or information sharing	47.8	48.6	48.6	40.0	29.8	30.7	23.3	60.6	58.9	36.7	51.2	40.8
Increased ability to develop new products or processes	54.2	36.2	36.8	36.1	33.0	33.3	6.2	49.0	47.0	68.4	51.2	63.5
Others	24.1	0.0	0.8	0.0	2.0	1.8	0.0	0.1	0.0	0.0	0.0	0.0

MSMEs = micro, small, and medium enterprises; ICT = information and communications technology; BPO = business process outsourcing
Source: PIDS (2015)

Introducing innovation in a firm is a complex process that requires coordination of multiple inputs. Firms can gain technical advice, guidance, or some inspiration for their innovation activities from several of sources of information. These sources of technology and innovation-related knowledge and information may be internal (i.e., from within the establishment itself or from other establishments within the enterprise) or external. The latter may be categorized as followed:

- Market: from suppliers, customers, clients, consultants, competitors, other businesses, commercial laboratories, or private research and development institutes
- Institutional: from the public sector, such as government research organizations and academia
- Other sources: from conferences, trade fairs, exhibitions, scientific journals, trade/technical publications, professional or industry associations or technical, and industry or service standards.

In the 2015 SIA, as in the 2009 SIA, establishments were asked to rank several potential information sources on a scale from ‘no relationship’ (4) to ‘high importance’ (1). The proportion of establishments that answered ‘high’ in each category is shown in Table 11.

Table 11. Proportion of MSMEs and large establishments rating information sources as of ‘high’ importance, by size of establishment

Information Source		Proportion (%)		
		MSMEs	Large Firms	All Firms
1. Internal source	a. Within your establishment or enterprise	9.1	32.3	10.2
	a. Suppliers of equipment, materials, components, or software	7.5	16.1	7.9
2. Market source	b. Clients or customer	14.1	19.8	14.3
	c. Competitors or other enterprise in your sector	8.7	9.0	8.7
	d. Consultants, commercial laboratories, or private R&D institutes	3.5	6.7	3.6

R&D = research and development; MSMEs = micro, small, and medium enterprises
Source: PIDS (2015)

Table 11. (continued)

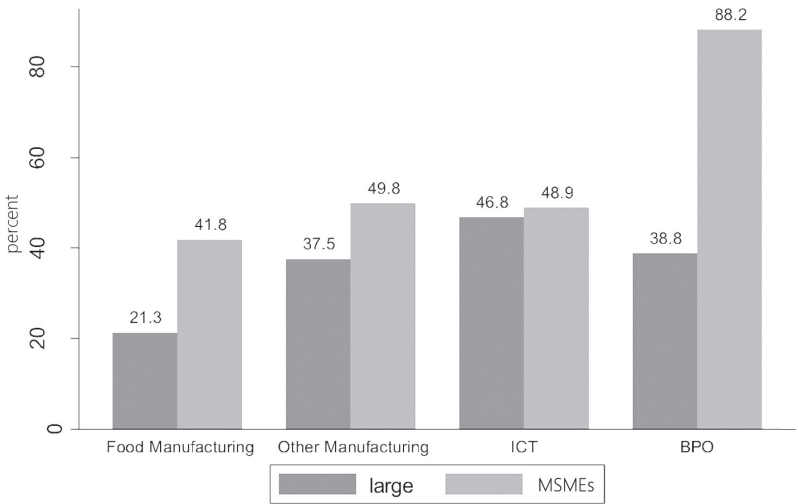
Information Source		Proportion (%)		
		MSMEs	Large Firms	All Firms
3. Institutional source	a. Universities or other higher education institutions	1.9	3.7	1.9
	b. Government or public research institutes	1.1	2.6	1.2
4. Other sources	a. Conferences, trade fairs, exhibitions	5.9	10.8	6.2
	b. Scientific journals and trade/technical publications	2.0	7.1	2.2
	c. Professional and industry associations	3.5	8.7	3.8

R&D = research and development; MSMEs = micro, small, and medium enterprises
Source: PIDS (2015)

Most establishments reported internal sources (10.2%) and market sources, especially clients (14.3%) and competitors (8.7%) as most important sources of information on innovation. A third (32.3%) and a fifth (19.8%) of large firms rated internal sources and customers, respectively, as highly important for innovation, while among SMEs, the corresponding proportions were a tenth (9.1%) and three-twentieth (14.1%), respectively. Thus, firms mostly relied on their own experience and knowledge, coupled with information from customers and competitors. Institutional sources of innovation and knowledge, particularly government (1.2%) or public research institutes (1.9%), were considered by firms, both MSMEs and large firms, to be of lowest importance as sources of information on innovation.

Nearly half (46.3%) of innovation-active firms were engaged in innovation cooperation with other establishments or noncommercial institutions. The proportion of innovators across industries with innovation cooperation ranged from 41.0 percent in food manufacturing to 66.8 percent in BPOs. Innovation cooperation was higher among innovation-active MSMEs than the corresponding large firms, with cooperation highest among BPO MSMEs at 88.2 percent (Figure 17).

Figure 17. Percentage of innovation-active MSMEs and large establishments with cooperation arrangements on innovation activities, by major industry



MSMEs = micro, small, and medium enterprises; ICT = information and communications technology; BPO = business process outsourcing
Source: PIDS (2015)

Among innovation-active collaborators, most had agreements that operated at a national level. Firms were least likely to cooperate on an ‘other ASEAN’ level. As shown in Table 12, the most frequent partners for cooperation among innovation-active firms were suppliers (93.2%), followed by other establishments within the enterprise (89.8%), and clients in the private sector (85.2%). The least likely cooperation arrangement was with government organizations (60.4%) and universities (63.7%).

Table 12. Proportion of innovation active and collaborative firms by cooperation partners

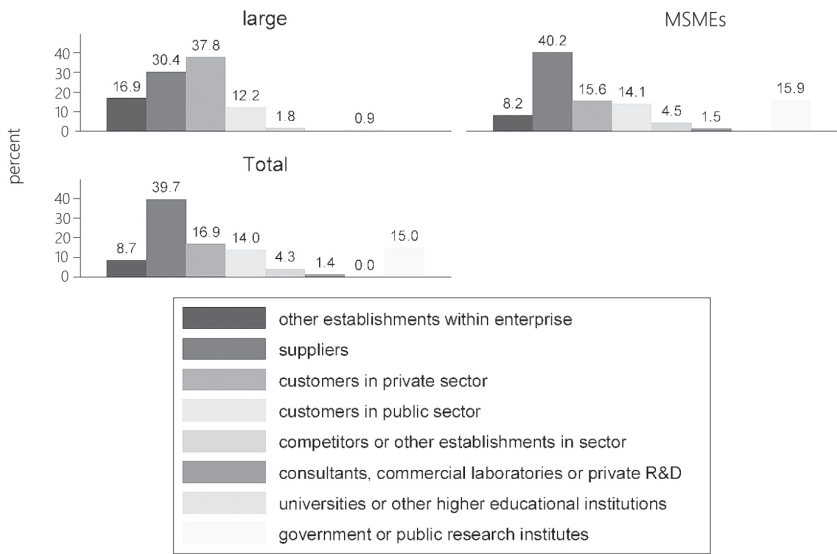
Type of Cooperation Partner	Proportion (%)			
	Philippines	Other ASEAN	All Other Countries	All Countries
Other establishments within enterprise	86.6	2.2	9.5	89.8
Suppliers of equipment, materials, components, or software	80.6	10.1	21.8	93.2
Clients or customers in private sector	78.1	2.3	8.5	85.2
Clients or customers in public sector	69.5	0.0	2.5	71.3
Competitors or other establishments in your sector	74.2	0.9	5.4	78.9
Consultants, commercial laboratories, or private R&D institutes	67.2	0.0	2.9	68.8
Universities or other higher education institutions	63.5	0.0	0.6	63.7
Government or public research institutes	60.2	0.0	1.0	60.4

R&D = research and development; ASEAN = Association of Southeast Asian Nations

Source: PIDS (2015)

Suppliers and clients in the private sector were also found to be the most valuable cooperation partners for innovation by innovation-active firms, with about three-tenths (30.4%) and two-fifths (37.8%) of large firms considering suppliers and clients, respectively, as most valuable, compared to two-fifths (40.2%) and three-twentieths (15.6%) of MSMEs, respectively (Figure 18). Another three-twentieths (15.9%) of innovation-active firms, particularly among MSMEs, rated government or public research institutes as most important partners for innovation. Universities were given the least importance by firms.

**Figure 18. Cooperation partner found most valuable for innovation
(innovation-active, collaborative establishments only)**

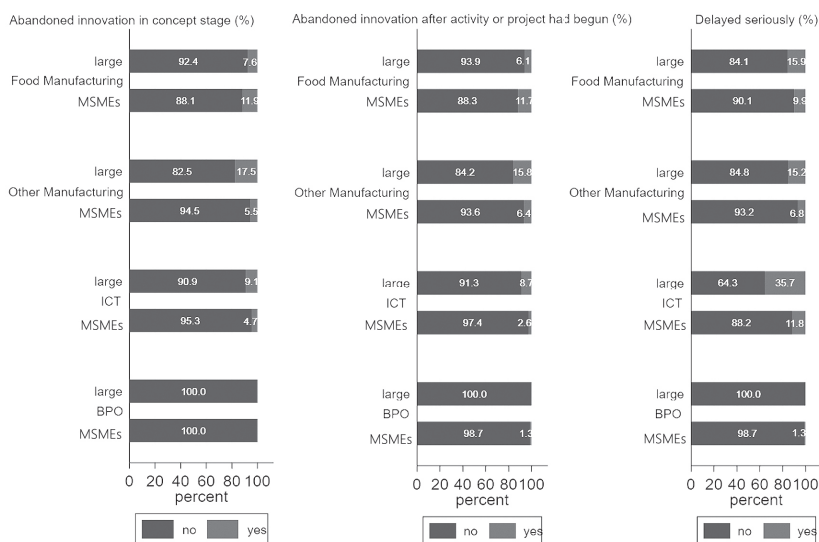


R&D = research and development
Source: PIDS (2015)

Factors Influencing and/or Preventing Innovation

In 2015, about 3 in 20 firms (13.4 %) had some abandoned or delayed innovation projects, especially among large firms (Figure 19). In food manufacturing, 11.8 percent of MSMEs abandoned the innovation at the concept stage, as against 7.6 percent for large firms. For establishments engaged in manufacturing of products other than food, 17.5 percent of large firms abandoned the innovation activity in the concept stage, compared to 5.5 percent for MSMEs. For ICT firms, the rate of abandonment of innovation was twice for large firms (9.1%) as that of MSMEs (4.7%). Similar proportions of firms abandoned innovation after the inception of the project or activity. Serious delays were reported by a third of large firms in ICT (35.7%) compared to 3 out of 20 large firms in food manufacturing (15.9%) and in other manufacturing (15.2%). Delays were experienced by a tenth of MSMEs (8.8%), ranging from 1.3 percent of MSMEs in BPO to 11.8 percent of MSMEs in ICT.

Figure 19. Proportion of MSMEs and large establishments across industry groups that abandoned innovation activities at the concept stage, after activity inception, or experiencing serious delays



MSMEs = micro, small, and medium enterprises; ICT = information and communications technology; BPO = business process outsourcing

Source: PIDS (2015)

The 2015 SIA asked establishments, both innovators and noninnovators, about a wide range of internal issues (such as human resources and financial resources) or external factors that constrain or prevent innovation. Tables 13 and 14 show the proportion of establishments (by size, as well as among innovators and noninnovators, respectively) that gave a 'high' rating to some potential barriers and bottlenecks to the conduct of innovation activities.

Cost factors were the most common issues identified by the establishments as significant barriers to innovation. Direct costs of innovation were viewed as too high. About 25.5 percent of establishments associated a high degree of importance to this. This was especially true among 28.1 percent of noninnovator MSMEs and 25 percent of large firms that were innovation-active. About 1 in every 5 establishments (18.5%) also mentioned lack of funds within the establishment or enterprise as a barrier to innovation. While cost factors were the most commonly reported hindrance to innovation among all establishments, about 1 in 5 establishments, especially among MSMEs, also reported knowledge factors or market factors as significant barriers to innovation. For both innovators and noninnovators among MSMEs, more than 10 percent cited the lack of qualified personnel as a significant barrier to innovation. A similar proportion of MSMEs also cited difficulty in finding cooperation partners for innovation as an important hindrance to the conduct of innovation activities. More than 10 percent of MSMEs also mentioned the uncertain demand for innovative goods or services, and a slightly bigger proportion (16.6%) considered the dominance by established enterprises in the market to be a barrier to innovation. Perceptions on barriers to innovation among MSMEs generally did not depend on whether or not the firm innovated. That is, MSMEs engaged in innovation activities were equally likely to perceive barriers as being highly important as noninnovative ones. The only exception was on the issues of lack of information on technology and lack of finances, which a bigger share of noninnovating MSMEs considered as significant barriers to innovation (more than MSMEs that were innovation active in 2015). Among larger firms, across the issues identified, a much bigger proportion of innovators than noninnovation active ones identified the issues (whether cost, knowledge, or market) as significant barriers to innovation.

Table 13. Percentage of MSMEs and large establishments that regarded potential barriers to innovation as “high” among innovators and non-innovators

Factors Hampering Innovation Activities		MSMEs		Large Firms	
		Innovators	Noninnovators	Innovators	All Firms
1. Cost Factors	a. Lack of funds within establishment or enterprise	17.3	19.7	19.4	14.3
	b. Lack of finances from sources outside enterprise	12.6	18.1	11.6	9.2
	c. Innovation costs too high	22.6	28.1	25.0	18.4
2. Knowledge Factors	a. Lack of qualified personnel	14.6	12.4	9.6	7.1
	b. Lack of information on technology	7.3	14.1	6.8	5.4
	c. Lack of information on markets	7.5	6.4	5.7	3.9
3. Market Factors	d. Difficulty in finding cooperation partners for innovation	13.5	11.2	3.9	3.1
	a. Market dominated by established enterprises	18.6	15.1	8.8	6.0
	b. Uncertain demand for innovative goods or services	10.2	12.0	10.9	8.5

MSME = micro, small, and medium enterprises
Source: PIDS (2015)

Table 14. Determinants of product innovation, process innovation, and innovation activity

Variable	(%)				
	Innovation Active	Product Innovator	Process Innovator	Organizational Innovator	Marketing Innovator
Age	0.105**	0.058	0.169***	0.102**	0.093**
Gross sales (in logarithm form)	0.198**	0.101	0.076	-0.100	0.004
Share of employees with a postbaccalaureate degree					
None	-0.653**	-0.628**	-0.461**	-0.725***	-0.638**
1 to 9 percent	-0.241	-0.153	-0.124	-0.310	-0.472*
10 to 19 percent	-0.104	-0.005	0.182	-0.279	-0.638**
20 and above	(omitted)	(omitted)	(omitted)	(omitted)	(omitted)
Export orientation:	-0.275	-0.463	-0.597**	-0.554*	-0.570**
Foreign ownership	0.061	-0.423	-0.534*	0.084	-0.936***
Interaction of export orientation and foreign ownership	-0.014	0.380	0.457	0.259	0.079
Share of female employment	0.001	0.003	0.002	0.000	0.004
Area					
NCR	-0.012	0.473*	-0.194	-0.103	-0.163
Balance Luzon	0.238	0.550**	0.322	0.287	0.038
Visayas	0.185	0.302	0.271	0.333	0.194
Mindanao	(omitted)	(omitted)	(omitted)	(omitted)	(omitted)

NCR = National Capital Region; ICT = information and communications technology; BPO = business process outsourcing
Notes: * = significant at 0.10; ** = significant at 0.05 level; ***=significant at 0.01 level; Body of data are regression coefficients of logistic regression models.
Source: Authors' calculations

Table 14. (continued)

Variable	Innovation Active	Product Innovator	Process Innovator	Organizational Innovator	Marketing Innovator
Industry group			(%)		
Food Manufacturing	0.649	0.085	0.962*	0.317	0.054
Other Manufacturing	0.577	0.090	1.024**	0.361	0.140
ICT	0.603	0.001	0.677	0.226	0.342
BPO	(omitted)	(omitted)	(omitted)	(omitted)	(omitted)
knowledge management	1.469**	1.148**	1.525***	2.002***	1.428**
Constant	-3.391***	-2.623***	-5.231***	-2.780***	-2.227***
Number of data	718	718	718	718	718
Overall chi-square	143.410	86.2	151.34	198.61	123.39
p-value	0.000	0.000	0.000	0.000	0.000
Pseudo-Rsquared	0.144	0.092	0.157	0.200	0.126
Specification link test (_hatseq)	0.063	0.145	0.072	0.070	0.148
p-value	0.524	0.32	0.394	0.447	0.147
Hosmer and Lemeshow goodness of fit	7.110	4.55	11.44	9.47	4.81
p-value	0.525	0.804	0.178	0.3042	0.7773

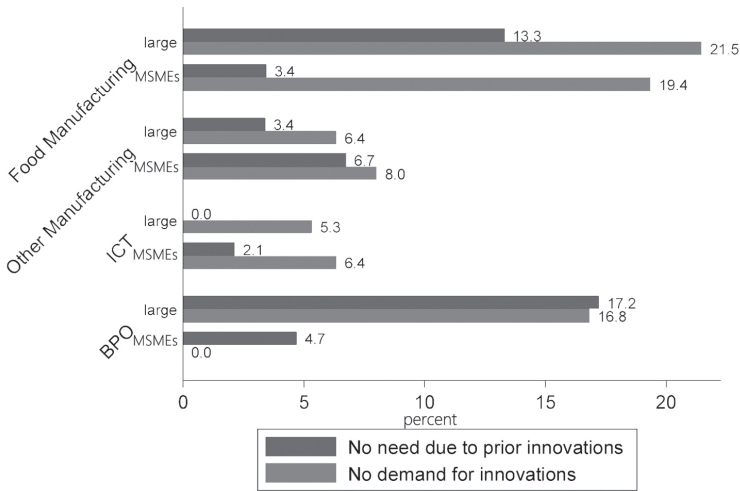
NCR = National Capital Region; ICT = information and communications technology; BPO = business process outsourcing

Notes: * = significant at 0.10; ** = significant at 0.05 level; *** = significant at 0.01 level; Body of data are regression coefficients of logistic regression models.

Source: Authors' calculations

Noninnovators cited market conditions more often as the reason for the lack of innovation, with about 3 in 20 (13.2%) of them finding no need to innovate due to lack of demand for innovations, while about 1 in 20 (4.7%) felt no need to innovate due to previous innovations. The difference in rates was most evident among MSMEs, especially those in food manufacturing, where one-fifth identified market conditions to be the reason for not innovating (Figure 20). In general, across noninnovating firms in all industries except for BPO, market conditions were more often cited to be the reason why the establishment did not innovate.

Figure 20. Percentage of establishments that gave a “high” rating to potential reasons not to innovate, by size—noninnovators only



MSMEs = micro, small, and medium enterprise; ICT = information and communications technology; BPO = business process outsourcing

Source: PIDS (2015)

Although the information in Table 13 and Figure 19, as well as the profile of innovation activity across firms in the previous sections, provide meaningful information about factors that may influence innovative behavior among firms, they do not explain the effects of these factors on innovation in the presence of other factors. In order to formulate and implement evidence-based innovation policies, it is important to examine the determinants of innovation as well as the barriers and bottlenecks to innovation. In this report, the cross-section econometric model, particularly a logistic (also called logit) regression⁶ model was used to identify whether certain factors may explain innovative behavior. The variables examined in the logistic model to explain how likely firms were product innovators, process innovators, and innovators in general, include

- gross sales (in logarithmic form);
- age of firm;
- share of employees with a postbaccalaureate degree (none, or some but less than 10 percent, from 10 to 19 percent, or at least 20 percent);
- export orientation (in particular, whether or not the firm has geographic market in ASEAN or other countries);
- foreign ownership (whether or not the firm has foreign capital participation);
- interaction of export orientation and foreign ownership;
- share of female employment;

⁶A logistic regression model is used to explain or predict a binary outcome from a set of p explanatory variables x_1, x_2, \dots, x_p that may be binary, continuous, or a mix of any of these. In this survey report, three logistic regression models are described. For each of the models, the dependent variable is dichotomous—whether a firm is a product innovator or not, whether a firm is a process innovator or not, and whether a firm is innovation active or not, and with probability of a firm being a product innovator, a process innovator, or innovation-active as θ .

In a logistic regression model, the log odds is a linear function of the p explanatory variables:

$$\log \left(\frac{\theta(x)}{1 - \theta(x)} \right) = \alpha + \beta_1 x_1 + \beta_2 x_2 + \dots + \beta_p x_p$$

where the odds is the ratio of the chance of a firm is a product innovator (or process innovator or innovation-active) to the chance it is not; α is the constant (intercept) of the logit equation and β_i is the coefficient of explanatory variable x_i .

If an explanatory variable is categorical or discrete with, say, k categories, then this variable will be represented by $k-1$ indicator variables representing the categories, with the “omitted” category serving as the base category to compare the other categories with.

- major industry (whether the firm is in the food manufacturing, electronics manufacturing, or information technology sectors);
- location (whether the firm is located in NCR, Balance Luzon, Visayas, or Mindanao); and
- engagement in knowledge management practices.

These explanatory variables were considered based on the survey results summarized earlier that cost factors (here proxied by constraints from gross sales of the firm), knowledge factors (including knowledge management practices in the firm, institutional capacities and constraints from qualifications of employees proxied by the share of employees with a postbaccalaureate degree), as well as market factors (proxied by geographic market, location, and type of industry) influence or hinder the ability of a firm to be product innovators, process innovators or, in general, be innovation active.

Although survey results also showed that large firms were more prone to innovate than MSMEs, firm size was correlated with gross sales, and thus, was not considered in the econometric model to prevent multicollinearity⁷.

The logistic regression models for innovation activity, product innovation, process innovation, and wider forms of innovation summarized in Table 14 were subjected to various diagnostics (particularly tests for model specification and for model fit) to determine their suitability:

- The econometric models suggest the importance of knowledge factors in innovative behavior of firms. In general, having knowledge management practices in establishments is a good determinant of product innovation, process innovation, and being an innovator. Human resources matter: firms with no employees with postbaccalaureate degrees are less likely to be innovators (in all forms of innovation—product, process, marketing, and organizational innovation) than firms with at least a fifth of employees with postbaccalaureate degrees. For marketing innovators, firms with less than 20 percent of

⁷ Multicollinearity occurs in a regression model when two or more explanatory variables in the model are approximately determined by a linear combination of other explanatory variables in the model. This is not desirable as unstable parameter estimates result from the difficulty in assessing the effect of the explanatory variables on dependent variables, since the explanatory variables effectively serve as proxies for each other.

employees with postbaccalaureate degrees are also less likely to innovate than those with 20 percent or more.

- Gross sales matters for innovative behavior, with firms having higher gross sales (which typically also have a larger number of employees) more likely to innovate than those with lower gross sales, *ceteris paribus*. Evidence is also strong that gross sales matters for process, organizational, and marketing innovation, but weak for product innovation.
- Location generally does not matter much, except for production innovation: Firms in NCR and Balance Luzon, all other things equal, are more likely to be product innovators than firms in Mindanao (and other areas).
- All other things being equal, firms across industries appear to be equally likely to be product innovators, but BPO establishments seem less likely to be process innovators than firms in other industries (particularly in food and other manufacturing).
- While it seems that having a geographic market limited to the local market makes a firm more likely to innovate, the evidence for this is actually weak. Export orientation has a negative effect on process, organizational, and marketing innovation. While bigger foreign capital participation seems to have a positive effect on innovation activity and organizational innovation, the evidence is weak. Foreign ownership even has a negative effect on process and marketing innovation, although in these cases there appears to be some positive interaction between export orientation and foreign ownership, though the evidence is weak. A gender disparity indicator, namely, the share of women employees to total employment, also does not contribute to explaining innovative behavior. The age of the firm also does not matter as far as product or process innovation (and wider forms of innovation) is concerned, but there is some evidence that older establishments are, all things being equal, more likely to be innovation active than younger ones.

Of the 891 establishments surveyed for the 2015 SIA, 232 firms were also interviewed in the 2009 SIA conducted by the Department of Science and Technology (DOST). For these panel firms, there was a reduction in innovative behavior, especially in process innovation, and wider forms of innovation (Table 15).

Table 15. Selected innovation statistics for panel establishments, by year

Innovation Activity	Proportion (%)					
	2009			2015		
	MSME	Large	All firms	MSME	Large	All firms
Innovation active	55.6	66.1	60.8	46.2	58.3	52.2
Product innovators	34.2	47.8	40.9	34.2	41.7	37.9
Process innovators	42.7	56.5	49.6	34.2	44.3	39.2
Organizational innovators	60.7	72.2	66.4	42.7	53.9	48.3
Marketing innovators	56.4	48.7	52.6	43.6	31.3	37.5

MSME = micro, small, and medium enterprise

Source: PIDS (2015)

From 2009 to 2015, the panel firms had changes in their characteristics, such as employment size (Table 16). While 25 out of 232 MSMEs had very observable upward movements in employment size, 15 MSMEs and 16 large firms had significant downward movements in the number of their employees. It is thus, not surprising why innovation behavior reduced for the establishments surveyed between 2009 and 2015, as changes in employment size of firms would suggest that capacities to innovate for these firms would also change.

Table 16. Frequency distribution of panel establishments by employment size in 2009 and 2015

2009 size	2015 size				
	Micro	Small	Medium	Large	All firms
Micro	46	4	0	3	53
Small	2	9	5	2	18
Medium	3	10	22	11	46
Large	2	4	10	99	115
All firms	53	27	37	115	232

Source: PIDS (2015)

In 2015, the proportion of panel establishments that engaged in innovation was lowest in BPO industry (Table 17). In terms of innovation outputs, food manufacturing outperformed other industries in product (41.9%) and marketing (51.4%) innovation, while manufacturing of goods other than food led in the process (41.8%) and organizational (56.4%) innovation.

As mentioned previously, there was a reduction in innovation behavior among panel establishments. The decline occurred across all industries and innovation outputs, except in food manufacturing, where there was an increase in the proportion of establishments that engaged in product innovation, and in ICT where there was no change. Table 18 further revealed that the reduction in innovation behavior in 2015 compared to 2009 was most severe in the BPO industry, with organizational innovation experiencing the biggest decline.

In Table 19, the results of a panel logistic random effects model were shown to explain the innovative behavior of the 232 panel firms interviewed in both the 2009 SIA and the 2015 SIA. The size of the establishment was a significant determinant of being innovation-active but in terms of specific innovation activity, it was significant only for process innovation, all other things being equal. Firms engaged in food manufacturing were more likely innovation active, product innovators, or process innovators relative to firms in the BPO sector, *ceteris paribus*. Firms belonging to electronics manufacturing or ICT were equally likely to innovate as firms in the BPO sector, all things equal. The area where the firms were located, particularly whether or not the firm was located in export processing zones, was not a significant determinant of innovation activity, product innovation, or process innovation. It was, however, marginally significant in explaining marketing innovation behavior. Finally, just as in the cross-section results for the 2015 SIA respondent firms, the practice of knowledge management was found to be a good determinant of innovation behavior for the panel firms, whether for innovation-active firms, product innovators, process innovators, marketing innovators, and organizational innovators.

Table 17. Key innovation statistics for panel establishments, by industry

Innovation Activity	2009				2015			
	Food manufacturing	Other manufacturing	ICT	BPO	All Firms	Food manufacturing	Other manufacturing	All Firms
	%							
Innovation active	58.1	64.5	54.8	58.8	60.8	55.4	54.5	52.2
Product innovators	35.1	44.5	38.7	47.1	40.9	41.9	38.2	37.9
Process innovators	45.9	52.7	48.4	47.1	49.6	40.5	41.8	39.2
Organizational innovators	58.1	70.9	61.3	82.4	66.4	44.6	56.4	48.3
Marketing innovators	58.1	46.4	58.1	58.8	52.6	51.4	31.8	37.5

ICT = information and communications technology; BPO = business process outsourcing
Source: PIDS (2015)

Table 18. Change in proportion of establishments in 2009 and in 2015 (in % points)

Innovation Activity	Food Manufacturing	Other Manufacturing	ICT	BPO	All firms
Innovation active	-2.7	-10.0	-9.6	-23.5	-8.6
Product innovators	6.8	-6.3	0.0	-29.5	-3.0
Process innovators	-5.4	-10.9	-9.7	-29.5	-10.4
Organizational innovator	-13.5	-14.5	-22.6	-53.0	-18.1
Marketing innovators	-6.7	-14.6	-25.8	-35.3	-15.1

ICT = information and communications technology; BPO = business process outsourcing
Source: PIDS (2015)

Table 19. Regression results on likely factors that influenced innovative behavior among panel firms

Variable	Innovation Active	Product Innovator	Process Innovator	Organizational Innovator	Marketing Innovator
Age	0.003	0.003	0.007	0.001	-0.006
Employment size (in logarithm form)	0.198**	0.103	0.150**	-0.097	0.097
Geographic market is solely local market	0.185	-0.045	0.308	0.007	0.278
Share of foreign capital participation	0.000	0.000	0.000	0.000	0.000**
Share of female employment	0.003	0.001	-0.002	-0.001	0.005
Firm in Philippine Economic Zone Authority (or not)	0.199	0.006	0.139	-0.552	-0.200
Industry group					
Food manufacturing	1.185**	0.983**	0.811**	0.525	0.397
Other manufacturing	0.395	0.666	0.418	-0.224	0.254
Information and Communications Technology	0.624	0.654	0.521	0.087	-0.055
Business Process Outsourcing	(omitted)	(omitted)	(omitted)	(omitted)	(omitted)
Knowledge management	1.551***	1.430***	1.619***	1.583***	2.345***
Constant	-2.721***	-2.824***	-2.878***	-0.757	-2.217
Number of panel observations	232	232	232	232	232

Notes: Derived from the microdata of 2015 Survey of Innovation Activities, Philippine Institute for Development Studies and 2009 Survey of Innovation Activities, Department of Science and Technology;

* = significant at 0.10, ** = significant at 0.05 level, *** = significant at 0.01 level;

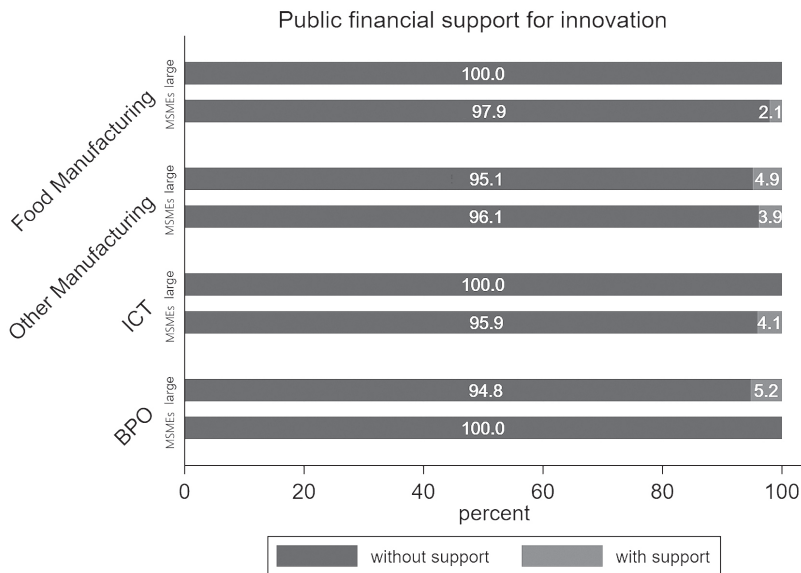
body of data are regression coefficients of panel logistic regression fixed effects models

Source: Authors' calculations

Support for Innovation

In 2015, firms rarely availed of public financial support for innovation, with only 3.1 percent getting support overall, and the proportion highest at 5.2 percent among large firms in the BPO industry (Figure 21). However, for MSMEs and large firms across industries, the proportion of firms having received government assistance or support for innovation was consistently higher than those that received public financial support. Overall, the proportion that received government support or assistance for innovation was 7.2 percent. Across industries, except ICT, the proportion having support for innovation among large firms was higher than the corresponding proportion among MSMEs. In ICT, 10.1 percent of MSMEs received support or assistance for innovation, compared to 6.2 percent for large firms.

Figure 21. Proportion of MSMEs and large establishments with public financial support for innovation, by industry



ICT = information and communications technology; MSMEs = micro, small, and medium enterprises; BPO = business process outsourcing
Source: PIDS (2015)

Overall, about a fifth (18.5%) of firms in 2015 were aware of any government innovation policies or initiatives, and of which, nearly half (46.5%) were provided some government support or assistance (Table 20).

Table 20. Proportion of establishments aware of any government innovation policy or intervention and of which, were provided government support or assistance in innovation, by size and by industry

Industry	Size	Establishments Aware of Any Government Innovation Policies (%)	Of which, Provided Government Support in Innovation (%)
Food Manufacturing	Large	33.1	45.8
	MSME	17.8	52.0
	Total	18.1	51.8
Other Manufacturing	Large	36.1	41.6
	MSME	13.8	47.4
	Total	15.2	46.6
ICT	Large	23.4	26.4
	MSME	30.3	38.0
	Total	30.1	37.7
BPO	Large	15.2	83.3
	MSME	4.9	0.0
	Total	9.5	63.4
All Industries	Large	29.9	44.7
	MSME	17.8	46.7
	Total	18.4	46.6

ICT = information and communications technology; BPO = business process outsourcing
Source: PIDS (2015)

MSMEs tended to consider training, tax deductions, tax holidays, tax credits, and loan guarantees to be very important government programs, while large firms valued training, tax holidays, tax deductions, duty free importation, and tax credits (Table 21). On average, government support programs least cited (at less than 20%) to be highly important for innovation included R&D funding, and direct subsidies (and others).

Table 21. Percentage of MSMEs and large establishments that regarded the government-support programs they received as “highly important” for innovation—recipients of government support only

Government Support Programs	Percentage (%)		
	MSME	Large	All firms
R&D Funding	15.7	4.8	14.9
Training	58.5	38.1	57.0
Direct Subsidies	13.3	6.2	12.8
Tax Deduction	42.2	32.5	41.5
Tax Credits	30.4	28.5	30.3
Tax Holidays	35.4	34.6	35.3
Duty free importation	15.5	29.0	16.5
Technical support/ advice	25.9	8.1	24.6
Infrastructure support	24.5	12.2	23.6
Subsidized loans	27.0	8.7	25.7
Loan Guarantees	27.4	7.4	25.9
Others	4.5	0.0	4.2

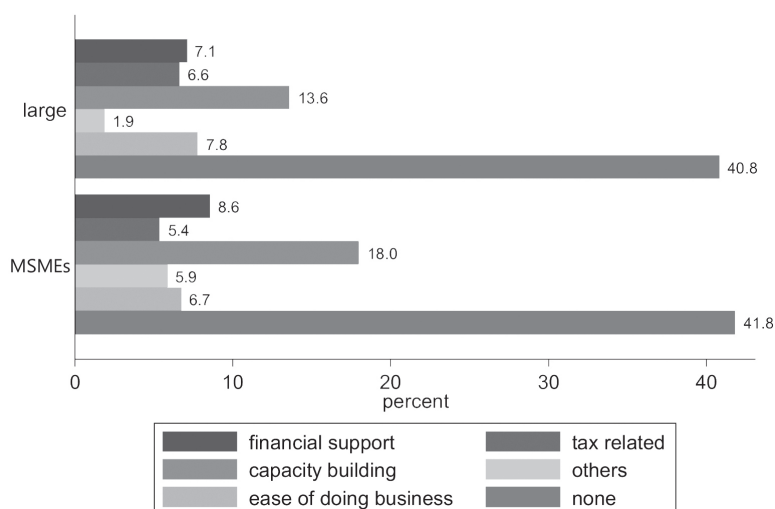
R&D = research and development; MSMEs = micro, small, and medium enterprises

Source: PIDS (2015)

In the 2015 SIA, firms were also asked how the government could encourage them to innovate. While about two-fifths (41.8%) did not provide specific suggestions, 17.8 percent of MSMEs and 13.6 percent of large firms identified capacity building as a mechanism for encouraging innovation (Figure 22). For MSMEs (8.6%) and large firms (7.8%), financial support and ease of doing business, respectively, ranked next to capacity building as factors encouraging innovation.

In 2015, less than a third (31.0%) of firms were registered either with the Board of Investments (BOI), the Philippine Economic Zone Authority (PEZA), or some other investment promotion agency (IPA). About a quarter (23.8%) of MSMEs registered at either BOI, or PEZA, or both, while among large firms, as much as 70.5 percent were registered with PEZA, 9.2 percent with BOI, and 3.4 percent with both (Figure 23).

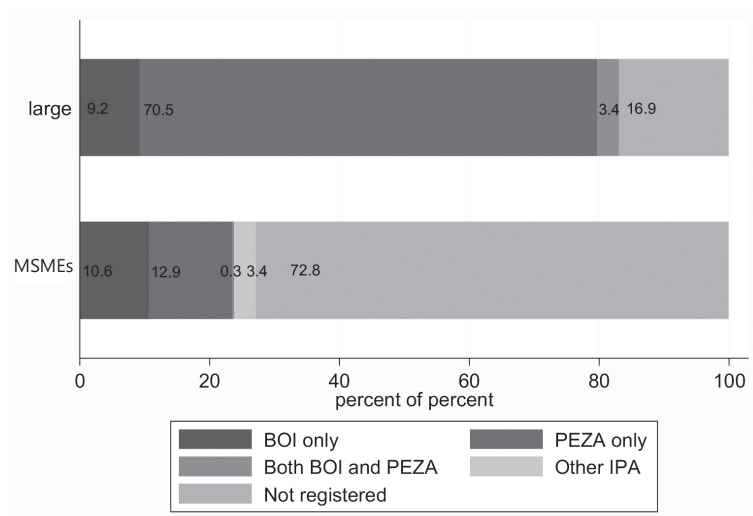
Figure 22. Perception by MSMEs and large establishments on how government can encourage innovation



MSMEs = micro, small, and medium enterprises

Source: PIDS (2015)

Figure 23. Proportion of MSMEs and large establishments by registration at an investment promotion agency



IPA = investment promotion agency; MSMEs = micro, small, and medium enterprises; BOI = Board of Investments; PEZA = Philippine Economic Zone Authority

Source: PIDS (2015)

Among establishments that registered with IPAs, income tax holidays were the most availed of incentive, especially by large firms in BPO (Table 22). Other well-utilized financial incentives included tax deductions (especially by large firms in ICT and other manufacturing), duty-free importation of raw material inputs, as well as value-added tax (VAT) exemption/credits for raw material inputs (especially by large firms in other manufacturing), duty-free importation of equipment and other capital inputs, as well as VAT exemption/credits for equipment and other capital inputs (across large firms except in food manufacturing). In 2015, all financial incentives were availed of by around 6 to 7 percent of firms, especially MSMEs (Table 23). In particular, among large firms, nearly a fifth of those in BPO availed of duty-free importation of both raw material inputs, as well as equipment and other capital inputs, VAT exemption/credits for raw material inputs as well as for equipment and other capital inputs, direct subsidies, and subsidized loans.

Table 22. Proportion of registered establishments in investment promotion agencies that availed financial and other incentives since registration with any IPAs, by major sector and size of firm

Financial and Other Incentives	Food Manufacturing			Other Manufacturing			Information and Communications Technology			Business Process Outsourcing			All Industries		
	MSME	Large	All firms	MSMEs	Large	All firms	MSMEs	Large	All firms	MSMEs	Large	All firms	MSMEs	Large	All firms
	%														
Income tax holiday	25.3	5.1	5.5	43.7	15.0	16.8	25.7	5.2	5.8	53.2	2.9	25.3	41.3	9.2	10.7
Tax deduction	15.3	5.8	6.0	32.8	13.1	14.3	36.9	2.2	3.2	16.5	5.6	10.4	26.8	8.2	9.1
Duty free importation of raw material inputs	15.7	3.0	3.2	45.9	16.1	18.0	12.0	1.2	1.5	20.7	3.3	11.1	32.6	8.1	9.3
Duty free importation of equipment and other capital inputs	5.1	2.7	2.8	43.0	14.5	16.3	42.1	1.4	2.6	31.1	4.6	16.4	34.3	7.4	8.7

MSMEs = micro, small, and medium enterprises; VAT = value-added tax
Source: PIDS (2015)

Table 22. (continued)

Financial and Other Incentives	Food Manufacturing			Other Manufacturing			Information and Communications Technology			Business Process Outsourcing			All Industries		
	MSME	Large	All firms	MSMEs	Large	All firms	MSMEs	Large	All firms	MSMEs	Large	All firms	MSMEs	Large	All firms
%															
VAT exemption/credits for raw material inputs	20.7	1.5	1.9	44.2	16.9	18.6	11.1	1.7	2.0	22.7	3.3	11.9	32.9	7.9	9.1
VAT exemption/credits for equipment and other capital inputs	13.3	1.2	1.4	40.8	13.9	15.6	40.1	2.2	3.3	38.4	3.3	18.9	35.8	6.6	8.0
Direct subsidy	8.6	1.7	1.8	5.4	1.2	1.5	8.3	0.8	1.0	0.0	0.0	0.0	5.0	1.3	1.5
Subsidized loan	8.6	1.7	1.8	2.9	1.1	1.2	0.0	0.6	0.5	0.0	0.0	0.0	2.9	1.3	1.3
Loan guarantees	8.6	1.8	1.9	6.1	3.4	3.6	0.0	0.6	0.5	5.2	0.0	2.3	5.8	2.2	2.4
Others	0.0	0.0	0.0	0.0	0.1	0.1	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0

MSMEs = micro, small, and medium enterprises; VAT = value-added tax
Source: PIDS (2015)

Table 23. Proportion of registered establishments in investment promotion agencies that availed financial and other incentives in 2015, by major sector and size of firm

Financial and Other Incentives	Food Manufacturing			Other Manufacturing			Information and Communications Technology			Business Process Outsourcing			All Industries		
	Large		All firms	Large		All firms	Large		All firms	Large		All firms	Large		All firms
	MSMEs			MSMEs			MSMEs			MSMEs			MSMEs		
	%														
Income tax holiday	1.3	6.6	6.5	12.2	10.1	10.2	3.1	4.2	4.2	5.2	1.0	2.9	8.2	7.6	7.6
Tax deduction	4.3	6.0	6.0	8.3	9.6	9.5	3.1	0.6	0.7	8.2	0.0	3.6	7.2	6.6	6.6
Duty free importation of raw material inputs	11.0	3.4	3.6	10.6	12.3	12.2	0.0	0.6	0.6	18.7	2.3	9.6	11.5	6.6	6.9
Duty free importation of equipment and other capital inputs	11.0	3.3	3.4	13.6	10.6	10.8	0.0	0.6	0.6	17.4	1.0	8.3	12.8	5.9	6.2

MSMEs=micro, small, and, medium enterprises; VAT=value-added tax

Source: PIDS (2015)

Table 23. (continued)

Financial and Other Incentives	Food Manufacturing			Other Manufacturing			Information and Communications Technology			Business Process Outsourcing			All Industries		
	MSMEs	Large	All firms	MSMEs	Large	All firms	MSMEs	Large	All firms	MSMEs	Large	All firms	MSMEs	Large	All firms
	%														
VAT exemption/ credits for raw material inputs	1.3	6.6	6.5	14.7	11.1	11.3	0.0	0.8	0.8	18.7	2.3	9.6	12.1	7.5	7.8
VAT exemption/ credits for equipment and other capital inputs	5.8	6.5	6.5	14.4	10.6	10.9	0.0	0.8	0.8	18.7	2.3	9.6	12.7	7.3	7.6
Direct subsidy	11.0	4.0	4.1	10.7	12.0	11.9	9.3	1.0	1.2	18.7	2.3	9.6	12.4	6.8	7.1
Subsidized loan	11.0	4.0	4.1	14.1	12.0	12.1	9.3	1.2	1.5	18.7	2.3	9.6	14.2	6.8	7.2
Loan guarantees	11.0	4.0	4.1	11.4	9.9	10.0	9.3	1.2	1.5	13.4	2.3	7.2	11.6	6.0	6.2
Others	0.0	0.6	0.6	0.3	0.2	0.2	0.0	0.1	0.1	5.2	2.4	3.7	1.3	0.4	0.5

MSMEs = micro, small, and, medium enterprises; VAT = value-added tax
Source: PIDS (2015)

Summary, Policy Issues, and Ways Forward

Summary of findings

Overall, the results of the 2015 SIA did not differ substantially from the general portrait described in the pilot 2009 SIA. While many firms are undertaking innovation, there are also many opportunities for the country to further enhance its innovation ecosystem. Key survey findings include the following:

- Major determinants to innovative behavior included gross sales of the firm, which correlate with establishment size, educational attainment of employees, knowledge management practices, location, and the industry group to which the firm belongs.
- Effects of innovation were mainly customer-driven.
- Firms reported that cost factors (especially direct costs for innovation activities), were the most important barrier to innovation. Knowledge factors were also a hindrance to innovative behavior. Government support for innovation was limited, particularly for product innovations. Knowledge networks were largely limited, too, with firms tending to cooperate with establishments within their enterprise, their customers, and suppliers. Establishments, especially small, medium, and large firms, also generally did not access technical assistance and support from the government and research institutions. Cooperation and linkages were rather minimal between firms and academic and research institutions.
- Firms that were interviewed in both 2009 and 2015 had less innovation activity owing to changes in their characteristics, including employment size. Knowledge management practices were a strong determinant for innovative behavior of these panel firms.

Innovative firms, especially MSMEs, did not consider government, academic, and research institutions as their key partners in their innovative practices, although micro firms appeared to be counting a lot on government support. Further, micro-sized firms need to rely on government support given their limited capacities. While various

financial incentives have been provided to firms, innovation policies have not been fully mainstreamed, and investments by both the public and private sectors in R&D and in innovation activities have been limited. Innovation support by government has often been viewed only within the context of science and technology (S&T), and implemented without a “whole-of-government” approach, often as a support by the Department of Trade and Industry (DTI) for MSMEs, or by DOST for science- and research-driven innovation activities. S&T spending in the country, whether in public or private expenditures, has been minimal (at less than the UNESCO’s suggested benchmark expenditures) so S&T infrastructure has hardly been integrated with production needs.

Implications for policy

Fostering innovation through education and training

The econometric results suggest that human resources matter for innovation, as firms without postbaccalaureate degree holders are less likely to be innovators. Moreover, continuous improvement in human resources matters too as the survey revealed the importance given by firms to internal and external training activities. Also, the respondents, regardless of establishment size, recognized the value of capacity building as the best way for government to encourage innovation.

Thus, using the gardener metaphor (WB 2010), the role of government in “preparing the ground” cannot be overemphasized. According to Organisation for Economic Co-operation and Development (2011), however, while it is clear that higher levels of human capital and skills are a foundation of improved innovation performance, designing appropriate policies and programs is, however, less straightforward. It cautions against simple “more-is-better” policy prescriptions as simply adding inputs that may not achieve the desired outcomes given that innovation is a multifaceted and complex undertaking. A better understanding of the linkages between skills and innovation is needed so that government can develop the appropriate interventions to build capacities for innovation.

Harnessing government procurement as a catalyst for innovation

Although governments have traditionally focused on supply-side instruments (e.g. fiscal incentives, targeted grants), demand-side policies can also be effective in stimulating innovation (Edler and Georghiou 2007; WB 2010). The SIA 2015 provided baseline evidence

of how government procurement encouraged innovation in Philippine industries. In some cases, the innovation was required as part of the contract, while in most instances, it was a voluntary response. Given the volume and range of public sector needs as well as the current initiative to ‘right-size’ the government through House Bill (HB) 5707, the potential of government procurement as a tool to spur innovation should not be ignored. Innovative solutions, goods, or services can be developed by industry for the government. Understanding the risks and learning from successful (and not so successful) examples of innovation through government procurement both here and in other countries will be useful in institutionalizing the policy and practice more widely across government agencies, both at the national and local levels.

Decline in innovation behavior in the BPO industry as a cause for concern

Information technology and business process management is now one of the pillars of the Philippine economy. It dominates services exports and establishes significant spillover benefits to other industries. As articulated in both the Comprehensive National Industry Strategy (DTI 2012) and the *2017–2022 Philippine Development Plan* (NEDA 2017) as well as the industry’s own roadmap, Roadmap 2022 also known as *Accelerate PH* (IBPAP 2016), the Philippines must continue to expand its market share while moving up the global value chain through more complex and higher value services. In light of these goals and potential threats from other competitors and technologies (e.g. automation and artificial intelligence), the decline in innovation behavior in the BPO industry, as revealed among firms interviewed in both the 2009 SIA and the 2015 SIA, is a concern and must be addressed.

Targeting assistance to MSMEs

The 2015 SIA shows that large establishments are more likely to engage in innovation. To encourage smaller firms to take risks and innovate, public interventions have to be adapted to the specific needs of firms, and will need to be impactful. Innovation generally varies across areas, and across firm size. Barriers and bottlenecks keeping MSMEs from innovating, especially constraints for accessing finance, knowledge, and skills, are not similar to those faced by large firms. MSMEs need to be supported with the aim of having them develop eventually into larger-

sized, more productive firms. Large firms, on the other hand, while having already more resources (both financial and human), will need to see the importance of going beyond their knowledge and cooperation networks for innovation.

Strengthening linkages between knowledge producers and users

A persistent problem that has been identified in both the 2009 and 2015 surveys is the very weak linkage between firms and the academic and research institutions. This issue is not unique to the Philippines or developing economies. Similar challenges have been experienced in the United States (WB 2010). Thus, the Bayh-Dole Act has been enacted in 1980 to encourage commercially relevant research and provide incentives to universities by giving recipients of federally-funded research intellectual property rights over the inventions they developed as a result of that funding. The World Bank (2010) identifies various mechanisms to strengthen knowledge and cooperation networks, along with the pros and cons of each (Table 24).

Table 24. Instruments for promoting relevant R&D in universities and greater commercialization of knowledge and interaction with enterprises

Instrument	Advantage	Disadvantage
Bayh-Dole-type legislation	Provides an incentive for researchers at universities and public research institutes to produce commercially relevant knowledge and earn income from the licensing or sale of the knowledge produced	May create an excessively commercial orientation in universities or public R&D labs, which compromises the public-good nature of university and public lab R&D Excessive preoccupation by universities and public R&D centers with the financial side of contracts may make transactions costs too high for businesses to work with them
Technology transfer offices	Provide economies of scale and experience in patenting applications and technology transfer contracts Create greater incentive to commercialize technology	May put too much pressure on researchers to privatize their knowledge and thus impede the public flow of knowledge Sometimes may not produce enough income to justify cost

Source: WB (2010)

Table 24. (continued)

Instrument	Advantage	Disadvantage
Science parks	Provide economies of scale in provision of basic infrastructure	May not achieve the economies of scale and agglomeration envisioned because they lack the necessary critical mass
	May lead to agglomeration economies in interaction between knowledge workers and technology-based firms	May become real estate operations more than knowledge centers
Business incubators at universities	Provide economies of scale in physical and institutional support for startups, including help in preparing business plans, matching scientists with business, obtaining permits to set up new businesses, and the like	May not function well because they lack the ability to match business skills with technology skills, or to provide complementary support services
		May focus too much on real estate rather than on promotion of new technology firms
Matching grants or tax subsidies for cooperation among universities, firms, and public research institutes	Create incentives for potentially mutually beneficial synergies among firms, universities, and public R&D labs	May not be used because of lack of trust between the parties. May subsidize interactions that would have happened anyway

Source: WB (2010)

An inventory and evaluation of existing mechanisms in the Philippines could be undertaken to identify effective programs that could be scaled up. The study of Veal (2014) examining various forms of industry-academe collaboration provides useful insights on what has worked and what else needs to be done.

Cost factors have been cited by firms in both the 2009 SIA and 2015 SIA as barriers to innovation. These cost factors can be brought down with effective partnerships. Most firms conducting innovation activities did not identify research and public institutions as a source of cooperation and information for innovation. The scope for partnerships to promote innovation is wide. Given the shift toward a more open system of innovation and the importance of knowledge management practices as a determinant of innovation, the government would need to actively promote the free exchange of ideas and flow of knowledge from outside the companies.

Establishments, especially large firms, need to be stimulated to cooperate for innovation, rather than being averse to networking with their competitors. Improving networking, linkages, and collaboration among the government, industry associations, and universities and research institutions must be pursued vigorously with far better budgets than currently available.

Recognizing the role of regulatory frameworks in promoting or inhibiting innovation

Government will need to regularly examine regulatory frameworks and remove obstacles to innovative initiatives. As suggested by respondents, improving the ease of doing business is one way by which government can encourage innovation in the firms. Government must also start to look into its regulatory frameworks, as regulators may have a tendency to focus on implementing regulations (that may not be always applicable to changing environments) over considering the ultimate goal of public welfare. Regulators and legislators have to seriously examine the extent to which regulations are becoming barriers to innovation.

The lack of regulation or weak enforcement can also hinder innovation. Quimba et al. (2017) presents two cases showing the importance of intellectual property: the first involves the pharmaceutical industry where a trademark filed by Pascual Laboratories led to improving product recognition and increased sales; the second involves the experience of local firms in the automotive industry with limited innovation because technology from parent companies are not transferred owing to intellectual property issues. The latter shows that mindsets of foreign companies, particularly in the automotive industry, could be changed if policies on intellectual property rights are stronger.

Although not captured in the survey⁸, the impact of restrictive regulations on technology adoption (and hence, innovation) must be considered. Current regulations and laws do not always adequately apply to new and emerging technologies, and consequently can be barriers and bottlenecks to innovation and creativity, and can even unintentionally reinforce monopolistic positions.

⁸ Partly because of the limited industries covered i.e., highly regulated service industries are not included

Adopting a whole-of-government approach

While a number of measures and systems are in place for the generation of new ideas (through tax incentives, IPR protection, and competitive S&T research), innovation policies should veer away from a linear innovation model⁹ to one encompassing the entire innovation ecosystem (Figure 3), with interventions formulated in consultation with all stakeholders. A national innovation framework and plan of action is required for facilitating interactions among the various players involved in the innovation ecosystems: universities, research laboratories, banks (for venture capital), and government agencies in charge of various sectors, such as DTI, DOST, Department of Agriculture (DA), and Department of Health. This innovation roadmap should take into consideration sector-specific characteristics and needs of firms. Public investments for large-scale programs to support innovation also require further boosting. Particular areas where more support is needed include determining the feasibility of research and their subsequent commercialization (technology financing programs, IPR support), establishing new businesses (venture capital, start-up funds) that are likely to conduct innovation activities, as well as generating and sustaining revenues through technology business incubators (TBIs), technology centers, and technoparks. Further, specific time-bound plans and interventions should be crafted to make R&D institutions more responsive to industry needs, and improve academic institutions in fostering creativity among learners for enhancing a technical culture.

Higher education information systems should be encouraged to pursue R&D without being hindered by myopic internal policies (STRIDE 2014). They should work on pursuing partnerships with private firms to work on product development and commercialization.

National government agencies, local government units, and the legislators need to work in tandem with the academe and business sectors to advocate for innovation, providing more leadership, and bringing people and institutions together. TBIs bring together the resources of the three major stakeholders related to innovation: government, startups/private firms, and the academe. Because these three would be directly affected by policies on startups, any national policies on innovation,

⁹ A linear innovation model assumes that R&D leads to innovation and commercialization of mature R&D outputs, product technologies, and consequently economic growth (Ancog and Aquino 2007).

including a framework and strategy, should be made in coordination and with inputs from all stakeholders.

Proposed legislative measures

Key legislative measures are currently being considered in both the House of Representatives and the Senate to spur innovation. A Senate bill (SB 1535), called the Philippine Innovation Act, has been passed last May 2017, which provides for the establishment of a National Innovation Council (NIC). The proposed NIC is to have the President as its chair, the Director-General of NEDA as vice-chair, with members that include 16 secretaries of various departments, including DTI and DOST, the Department of Information and Communications Technology (DICT) and the Department of Budget and Management (DBM), as well as the Director-General of the Intellectual Property Office, and seven executive members (at least one of whom shall be a woman) representing business, the academe, and the scientific community. Except for the private sector composition, the structure of the NIC appears to largely mimic an expanded composition of secretaries comprising the NEDA Board¹⁰. The NIC is to be given the responsibility of crafting a National Innovation Agenda and Strategy Document (NIASD). Further, the legislation earmarks approximately PHP 1 billion to finance innovation grants for entrepreneurship. A corresponding HB is currently being discussed in the House of Representatives. While this legislative measure provides a concrete mechanism for developing an innovation roadmap through the NIASD for supporting MSMEs and for mainstreaming innovation policy, the establishment of this new body may duplicate existing structures, such as the NEDA Board, although the latter tends to focus more on approving infrastructure investments during its meetings. If a new body were to be established that will involve key cabinet secretaries and representatives of the private sector and academic/research institutions, there may be more sense in keeping the membership in the proposed NIC much smaller, to include the secretaries of DTI, DOST, DICT, Commission on Higher Education, DA, DBM, and NEDA, with meetings quarterly set under the leadership of one of them to discuss mainstreaming of innovation policy

¹⁰ In the NEDA Board, the President and NEDA Director-General serve respectively as chair and vice-chair. Board members include secretaries of 11 departments (such as DTI and DOST), a representative of the Bangko Sentral ng Pilipinas, heads of several government agencies (such as the Housing and Urban Development Coordinating Council), the Chairperson of the Metro Manila Development Authority, the President of the Union of Local Authorities of the Philippines, the Governor of the Autonomous Region for Muslim Mindanao, and the Chairperson of the Mindanao Development Authority.

and supporting innovation activities. Funds earmarked, such as the proposed PHP 1 billion grants, may already be best channeled directly through existing mechanisms, such as the MSME support facilities at DTI or DOST's Small Enterprise Technology Upgrading Program (DOST 2015).

Both the House of Representatives and the Senate are also working on the "Science for Change Program (S4CP) Act". This legislative initiative increases funds for DOST for innovation, considerably increasing R&D budgets from PHP 5.8 billion to PHP 21 billion, and more or less doubling yearly over the next five-year period to reach PHP 672 billion by 2022. The S4CP provides justification for this expanded S&T budget, given a comprehensive action plan to expand current S&T programs, support new initiatives, invest in S&T human resources, and build capacities of R&D institutions and industrial competitiveness. While this measure provides more concrete and ambitious ground than the proposed Philippine Innovation Act, the S4CP Act tends to be S&T-focused, and there are concerns that bigger need not always be better. Although innovation derives a lot from S&T or R&D, and thus government needs to build a good science base, innovation is ultimately practiced in the economy to add value to products and services. It is important to pursue an impact evaluation of some large-funded S&T projects to determine what works and what does not. Further, as Cirera and Maloney (2017) points out, although there are potential gains from "catch-up" investments in innovation, if the stock of complementarity factors (human capital, firm and management capabilities, financial markets) are missing, the returns on investment will be low and can even be negative.

Concluding remarks

Innovation policy is quite complex and should be aimed at facilitating relationships of various actors and institutions involved in the innovation ecosystem: firms, academic and research institutions, banks (for venture capital), and government agencies in charge of various sectors. Thus, innovation investments should be broader than merely more support for S&T, or R&D, although these are important. Both the legislative initiatives in the Senate and the House are welcome developments to improve the innovation ecosystem, but they ultimately must be focused on (a) removing barriers and bottlenecks to innovative initiatives in regulatory frameworks; (b) providing meaningful and impactful support to innovators; (c) investing

in the required technology, research infrastructure, and R&D researchers; and (d) carrying out appropriate reforms in education, the investment climate, and trade. Innovation policy acts within a context, typically an established institutional setting that can be crowded with many agencies that have limited financial resources.

Thus far, the country has conducted two rounds of the SIA, the 2009 SIA and the 2015 SIA. The first was a pilot survey conducted by DOST, while the second was conducted by PIDA. It would be important to regularly monitor the extent of innovation activities being undertaken, every three to five years, since the management of the innovation ecosystem cannot be done effectively without measuring relevant indicators. More financial resources would certainly be required to support innovation, but where these resources go must be examined, and a champion for innovation in the policy environment will most certainly be needed to ensure that innovation gets mainstreamed.

Appendix

Appendix 1. 2015 Survey of Innovation Activities of Establishments Questionnaire



SIA Form 1
PSA Approval No. PSA – 1632
Expires 31 July 2017

2015 SURVEY OF INNOVATION ACTIVITIES OF ESTABLISHMENTS

Dear Sir/Madam:

The Philippine Statistics Authority, in collaboration with the Philippine Institute of Development Studies (PIDS), is conducting the 2015 Survey of Innovation Activities of Establishments (SIA). The survey aims to generate information on the innovative behavior of establishments in selected Philippine areas and to determine the factors that drive their innovation performance. The data shall serve as basis for mainstreaming the innovation system approach into the center-stage of national policy-making through the establishment of a systems-oriented, policy-relevant and internationally comparable innovation survey and indicator system in the country.

Among the data to be collected for the survey are profile of the establishment; innovations on product, process, organization and marketing; innovation activities and expenditures; sources of information and co-operation for innovation activities; effects of innovation, factors hampering innovation activities; intellectual property protection; public sector procurement and innovation; registration with investment promotion agencies; knowledge management; and, government innovation-related policies.

In this regard, we wish to inform you that your office/establishment is one of the respondents for this survey. May we request you to provide us the requested data by accomplishing this questionnaire. Our field staff will be coordinating with your office in collecting the accomplished questionnaire.

Your kind cooperation in this undertaking will be very much appreciated. Rest assured that the results of the survey will be kept with utmost confidentiality as stipulated in Section 26 of Republic Act 10625. The same law under Section 27 obliges establishments to provide the required information.

Thank you very much.

Very truly yours,

LISA GRACE S. BERSALES, Ph.D.
National Statistician
Philippine Statistics Authority

GILBERTO M. LLANTO, Ph.D.
President
Philippine Institute of Development Studies

CONTACT PERSON OF PSA														
Person to be contacted for queries regarding this form:														
Name _____										Address _____				
Position Title _____														
Tel. No. _____					Fax No. _____					Email Address _____				

FOR PSA USE ONLY																
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Measuring and Examining Innovation in Philippine Business and Industry

Page 2	PLEASE ENTER ON THE APPROPRIATE SPACE OR BOX THE DATA REQUESTED														
<p>Innovation is defined as the act of introducing something new. This may be introduced through a number of activities which may include improvement of product, the implementation of improved processes, logistics and distribution methods as well as organizational method and marketing.</p> <p>Innovation activities include the acquisition of machinery, equipment, software, and licenses; engineering and development work, training, marketing and research and development (R&D, including basic R&D) when they are <u>specifically undertaken to develop and/or implement a product or process innovation</u>.</p> <p>R&D is defined as the creative work undertaken to increase knowledge and its use to devise new and improved products and processes (including software development).</p>															
1. GENERAL INFORMATION ABOUT THE ESTABLISHMENT															
<p>A. Business and Registered Name in 2016, Establishment Website, Establishment Email Address and Tax Identification Number (TIN)</p> <p>1. Business Name : _____</p> <p>2. Registered Name : _____</p> <p>3. Establishment Website : _____</p> <p>4. Establishment Address : _____</p> <p>5. TIN : _____</p>															
<p>B. Economic Activity or Business in 2016</p> <p style="font-size: small;">Describe in detail the main and other activities of this establishment.</p> <div style="float: right; border: 1px solid black; padding: 2px; text-align: center;">DO NOT FILL (For PSA use only)</div> <div style="float: right; border: 1px solid black; padding: 2px;"> 2009 PSIC </div> <div style="clear: both;"></div> <p>1. Main Activity</p> <p style="font-size: small;">Refers to the activity that contributes the biggest or major portion of the gross income or revenue of this establishment.</p> <p>_____</p> <p>2. Major product/good produced or sold and/or type of service rendered (specify)</p> <p>_____</p>															
<p>C. Year Started Operation</p> <p style="font-size: small;">Indicate the year when this establishment started operation regardless of its location in the Philippines.</p> <div style="float: right; border: 1px solid black; padding: 2px;"> <table style="border-collapse: collapse;"> <tr> <td style="width: 20px; height: 20px;"></td> <td style="width: 20px; height: 20px;"></td> <td style="width: 20px; height: 20px;"></td> <td style="width: 20px; height: 20px;"></td> <td style="width: 20px; height: 20px;"></td> <td style="width: 20px; height: 20px;"></td> <td style="width: 20px; height: 20px; text-align: center;">LN NO</td> </tr> <tr> <td></td> <td></td> <td></td> <td></td> <td></td> <td></td> <td style="text-align: center;">01</td> </tr> </table> </div> <div style="clear: both;"></div>								LN NO							01
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<p>D. Legal Organization in 2016</p> <p style="font-size: small;">Mark (✓) the box corresponding to the best description of this establishment.</p> <table border="1" style="width: 100%; border-collapse: collapse;"> <tr> <td style="width: 50%; padding: 5px;"> 1 <input type="checkbox"/> Single proprietorship 2 <input type="checkbox"/> Partnership 3 <input type="checkbox"/> Government corporation 4 <input type="checkbox"/> Stock corporation </td> <td style="width: 50%; padding: 5px;"> 5 <input type="checkbox"/> Non-stock, non-profit Corporation 6 <input type="checkbox"/> Cooperative 7 <input type="checkbox"/> Others, specify: _____ </td> <td style="width: 10%; padding: 5px; text-align: center; vertical-align: top;"> LN NO 02 </td> </tr> </table>		1 <input type="checkbox"/> Single proprietorship 2 <input type="checkbox"/> Partnership 3 <input type="checkbox"/> Government corporation 4 <input type="checkbox"/> Stock corporation	5 <input type="checkbox"/> Non-stock, non-profit Corporation 6 <input type="checkbox"/> Cooperative 7 <input type="checkbox"/> Others, specify: _____	LN NO 02											
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<p>E. Economic Organization in 2016</p> <p style="font-size: small;">Mark (✓) the box corresponding to the best description of this establishment.</p> <table border="1" style="width: 100%; border-collapse: collapse;"> <tr> <td style="width: 50%; padding: 5px;"> 1 <input type="checkbox"/> Single establishment 2 <input type="checkbox"/> Branch only <i>Provide details of main office below</i> 3 <input type="checkbox"/> Establishment and main office <i>Both located in the same address and with branches elsewhere</i> 4 <input type="checkbox"/> Main office only 5 <input type="checkbox"/> Ancillary unit other than main office <i>Provide details of main office below</i> </td> <td style="width: 50%; padding: 5px;"> <p>Single establishment is an establishment which has neither branch nor main office.</p> <p>Branch is an establishment which has a separate main office located elsewhere.</p> <p>Main office is the unit which controls, supervises and directs one or more establishments of an enterprise.</p> <p>Ancillary unit is the unit that operates primarily or exclusively for a related establishment or group of related establishments and provides goods or services that support but do not become part of the output of those establishments.</p> </td> <td style="width: 10%; padding: 5px; text-align: center; vertical-align: top;"> LN NO 03 </td> </tr> </table>		1 <input type="checkbox"/> Single establishment 2 <input type="checkbox"/> Branch only <i>Provide details of main office below</i> 3 <input type="checkbox"/> Establishment and main office <i>Both located in the same address and with branches elsewhere</i> 4 <input type="checkbox"/> Main office only 5 <input type="checkbox"/> Ancillary unit other than main office <i>Provide details of main office below</i>	<p>Single establishment is an establishment which has neither branch nor main office.</p> <p>Branch is an establishment which has a separate main office located elsewhere.</p> <p>Main office is the unit which controls, supervises and directs one or more establishments of an enterprise.</p> <p>Ancillary unit is the unit that operates primarily or exclusively for a related establishment or group of related establishments and provides goods or services that support but do not become part of the output of those establishments.</p>	LN NO 03											
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<p>E.1 Main Office</p> <p>1. Name of Main Office _____</p> <p>2. Address of Main Office _____</p> <p>3. Contact Person in Main Office</p> <div style="display: flex; justify-content: space-between;"> <div style="width: 45%;"> a. Name _____ b. Title/Designation _____ c. Telephone No. _____ </div> <div style="width: 45%;"> d. Fax No. _____ e. Email Address _____ </div> </div>															
<p>E.2 Name and Address of Parent Company</p> <p style="font-size: small;">If box 1, 3 or 4 is marked in ITEM 1D, provide Name and Address of parent company. If no parent company, write NONE.</p> <p>1. Name _____</p> <p>2. Address _____</p>															

Continued on Page 3

PLEASE ENTER ON THE APPROPRIATE SPACE OR BOX THE DATA REQUESTED

Page 3

1. GENERAL INFORMATION ABOUT THE ESTABLISHMENT (cont.)**F. Is this establishment a franchise?**

Mark (✓) appropriate box.

1 <input type="checkbox"/> YES	2 <input type="checkbox"/> NO	LN NO 04
--------------------------------	-------------------------------	-------------

G. In which geographic markets did this establishment sell goods or services from January 2015 to March 2016?

Mark (✓) applicable box/es.

1 <input type="checkbox"/> Local (within the region)	3 <input type="checkbox"/> Other ASEAN countries (Brunei, Cambodia, Indonesia, Lao PDR, Malaysia, Myanmar, Singapore, Thailand, Vietnam)	LN NO 05
2 <input type="checkbox"/> National (within the country)	4 <input type="checkbox"/> All other countries	

2. CAPITAL PARTICIPATION AS OF 31 DECEMBER 2015

Capital participation refers to the claims of foreign and/or local investors against capital/equity.

Indicate the percent share of the stockholder by nationality.

Nationality	%	LN NO	Nationality	%	LN NO	Nationality	%	LN NO
1. Filipino	___%	01	5. German	___%	05	9. Taiwanese	___%	09
2. American	___%	02	6. Japanese	___%	06	10. Others, <i>specify</i> : _____	___%	10
3. British	___%	03	7. Korean	___%	07			
4. Chinese	___%	04	8. Singaporean	___%	08			

3. EMPLOYMENT AS OF 15 NOVEMBER 2015**INCLUDE:**

- Directors of corporations working for pay
- Executives/managers and other officers of the same category
- Working owners
- Full-time/part-time employees working in or for the establishment and receiving pay
- Employees working away from this establishment paid by and under the control of this establishment
- Employees on sick or maternity leave
- Employees on paid vacation or holiday
- Employees on strike
- Persons working for at least 1/3 of the time normal to the establishments without regular pay
- Apprentices and learners
- Any other employee receiving regular pay not reported above

EXCLUDE:

- Directors paid solely for their attendance at meetings of Board of Directors
- Consultants
- Members of cooperatives who do not receive regular pay
- Workers receiving commissions only
- Workers on indefinite leave
- Homeworkers
- Other workers not in the payroll of this establishment

Report the employment of this establishment as of 15 November 2015.

Total Employment by Sex	Number	LN NO
a. Male		01
b. Female		02
c. Total (sum of a and b)		03

4. EDUCATIONAL BACKGROUND OF WORKERS**A. Approximately, what percent of total employment as of 15 November 2015 had post-baccalaureate degree?**

Mark (✓) appropriate box.

1 <input type="checkbox"/> 0%	3 <input type="checkbox"/> 5% to 9%	5 <input type="checkbox"/> 15% to 19%	LN NO 01
2 <input type="checkbox"/> 1% to 4%	4 <input type="checkbox"/> 10% to 14%	6 <input type="checkbox"/> 20% to 100%	

Continued on Page 4

Measuring and Examining Innovation in Philippine Business and Industry

Page 4

PLEASE ENTER ON THE APPROPRIATE SPACE OR BOX THE DATA REQUESTED

5. PRODUCT (GOODS AND/OR SERVICES) INNOVATION

For the purposes of this survey, product refers to goods and/or services. A product innovation is the market introduction of a new good or service or a significantly improved good or service with respect to its capabilities, such as improved software, user friendliness, components or sub-systems. The innovation (new or improved) must be new to this establishment, but it does not need to be new to its sector or market. It does not matter if the innovation was originally developed by this establishment or by other establishment.

A. Since January 2015, did this establishment introduce...

Mark (✓) appropriate box.

	YES	NO	LN NO
1. New or significantly improved goods. (Exclude the simple resale of new goods purchased from other establishments and changes of a solely aesthetic nature.)	1 <input type="checkbox"/>	2 <input type="checkbox"/>	01
2. New or significantly improved services.	1 <input type="checkbox"/>	2 <input type="checkbox"/>	02

If NO to both options, go to Item 6.A. Otherwise, proceed to Item 5.B.

B. Since January 2015, were any of the product innovations of this establishment...

Mark (✓) appropriate box.

	YES	NO	LN NO
1. New to the market of this establishment This establishment introduced a new or significantly improved good or service onto its market before its competitors (it may have already been available in other markets).	1 <input type="checkbox"/>	2 <input type="checkbox"/>	03
2. Only new to this establishment This establishment introduced a new or significantly improved good or service that was already available from its competitors in its market.	1 <input type="checkbox"/>	2 <input type="checkbox"/>	04

C. Which unit developed these product innovations?

Mark (✓) appropriate box.

	LN NO
1 <input type="checkbox"/> Mainly this establishment	05
2 <input type="checkbox"/> This establishment together with its main office and/or establishment within the enterprise	
3 <input type="checkbox"/> Other establishments or institutions	

D. What was the gross sales of this establishment in 2015?

Include all taxes except VAT.

Report value of gross sales in Philippine peso.

	2015	LN NO
Gross Sales	PHP	06

E. What were the percentages of the following to gross sales of this establishment in 2015?

Report percent to gross sales in column "Percentage Distribution" for each of the following.

	Percentage Distribution	LN NO
1. Product innovations introduced during 2015 that were <u>new to the market</u> of this establishment	_____ %	07
2. Product innovations introduced during 2015 that were only <u>new to this establishment</u>	_____ %	08
3. Product that were unchanged or only marginally modified during 2015 (include the resale of new goods and services purchased from other establishments)	_____ %	09
4. Total gross sales in 2015 (sum of 1 to 3)	_____ %	10

Continued on Page 5

PLEASE ENTER ON THE APPROPRIATE SPACE OR BOX THE DATA REQUESTED

Page 5

6. PROCESS INNOVATION

A process innovation is the implementation of new or significantly improved production process, distribution method, or support activity for the goods or services of this establishment. The innovation (new or improved) must be new to this establishment, but it does not need to be new to its sector or market. It does not matter if the innovation was originally developed by this establishment or by other establishments.

Exclude purely organizational innovations.

A. Since January 2015, did this establishment introduce...

Mark (✓) appropriate box.

	YES	NO	LN NO
1. New or significantly <u>improved methods</u> of manufacturing or producing goods and/or services.	1 <input type="checkbox"/>	2 <input type="checkbox"/>	01
2. New or significantly <u>improved logistics, delivery or distribution</u> methods for its inputs, goods and/or services.	1 <input type="checkbox"/>	2 <input type="checkbox"/>	02
3. New or significantly improved supporting activities for its processes, such as maintenance systems or operations for purchasing, accounting or computing	1 <input type="checkbox"/>	2 <input type="checkbox"/>	03

If NO to all options, go to Item 7. Otherwise, proceed to Item 6.B.

B. Which unit developed these process innovations?

Mark (✓) appropriate box.

	LN NO
1 <input type="checkbox"/> Mainly this establishment	04
2 <input type="checkbox"/> This establishment together with its main office and/or establishment within the enterprise	
3 <input type="checkbox"/> Other establishments or institutions	

7. ONGOING OR ABANDONED PRODUCT AND PROCESS INNOVATION ACTIVITIES**A. If this establishment had no product or process innovations since January 2015,**

Mark (✓) appropriate box.

	YES	NO	LN NO
1. Did this establishment have any innovation activities to develop product or process innovations that are <u>still ongoing</u> ?	1 <input type="checkbox"/>	2 <input type="checkbox"/>	01
2. Did this establishment have any innovation activities to develop product or process innovations that <u>were abandoned</u> from January 2015 to March 2016?	1 <input type="checkbox"/>	2 <input type="checkbox"/>	02
3. Did this establishment had any innovation activities to develop product or process innovations that <u>were done</u> before January 2015?	1 <input type="checkbox"/>	2 <input type="checkbox"/>	03

If NO to Items 7A.1, 7A.2 and 7A.3, go to Item 11A. Otherwise, proceed to Item 8A.

Continued on Page 6

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Page 6

PLEASE ENTER ON THE APPROPRIATE SPACE OR BOX THE DATA REQUESTED

8. INNOVATION ACTIVITIES AND EXPENDITURES

A. Since January 2015, did this establishment engage in the following innovation activities:

Mark (✓) appropriate box.

Type of Innovation Activity	YES	NO	LN NO
1. In-house R&D Creative work undertaken within this establishment to increase knowledge and its use to devise new and improved products and processes (including software development.)	1 <input type="checkbox"/>	2 <input type="checkbox"/>	01
a. If YES, did this establishment perform R&D from January 2015 to March 2016? 1 <input type="checkbox"/> Continuously? 2 <input type="checkbox"/> Occasionally?			02
2. Outsourced R&D Same activities as above, but performed by other establishments or by public or private research organizations and acquired by this establishment.	1 <input type="checkbox"/>	2 <input type="checkbox"/>	03
3. Acquisition of machinery, equipment and software to produce new or significantly improved products and processes			
a. Machinery and equipment	1 <input type="checkbox"/>	2 <input type="checkbox"/>	04
b. Computer hardware	1 <input type="checkbox"/>	2 <input type="checkbox"/>	05
c. Computer software	1 <input type="checkbox"/>	2 <input type="checkbox"/>	06
4. Acquisition of existing knowledge from others Purchase or licensing of patents and non-patented inventions, copyrighted works, know-how, and other types of knowledge from other enterprises or organizations.	1 <input type="checkbox"/>	2 <input type="checkbox"/>	07
5. Training for innovative activities Internal or external training for its personnel specifically for the development and/or introduction of new significantly improved products and processes.	1 <input type="checkbox"/>	2 <input type="checkbox"/>	08
6. Market introduction of innovations In-house or contracted out activities for the market introduction of its new or significantly improved goods and services including market research and launch advertising.	1 <input type="checkbox"/>	2 <input type="checkbox"/>	09
7. Design In-house or contracted out activities to design or alter the shape of appearance of goods or services.	1 <input type="checkbox"/>	2 <input type="checkbox"/>	09
8. Other Other in-house or contracted out activities to implement new or significantly improved products and processes such as feasibility studies, testing, tooling up, industrial engineering, etc.	1 <input type="checkbox"/>	2 <input type="checkbox"/>	10

B. How much is the expenditure for each of the following innovation activities in 2015?

Report the expenditure including personnel and related costs in 2015. If this establishment had no expenditures in 2015, mark (✓) in column "None".

Innovation Activity	VALUE IN PESOS	None	LN NO
1. In-house R&D Include salaries, operating expenses and capital expenditures on buildings and equipment specifically for R&D.	PHP	<input type="checkbox"/>	11
2. Outsourced R&D	PHP	<input type="checkbox"/>	12
3. Acquisition of machinery, equipment and software Exclude expenditures on these items for R&D.	PHP	<input type="checkbox"/>	13
4. Acquisition of other external knowledge Purchase of patents, prototypes, designs, consultants.	PHP	<input type="checkbox"/>	14
5. Other innovation activities including design, training, marketing and other relevant activities	PHP	<input type="checkbox"/>	15
6. Total expenditures (sum of 1 to 5)	PHP		16

Continued on Page 7

PLEASE ENTER ON THE APPROPRIATE SPACE OR BOX THE DATA REQUESTED

Page 7

8. INNOVATION ACTIVITIES AND EXPENDITURES (cont.)**C. Since January 2015, did this establishment receive any public financial support for innovation activities from the following levels of government?**

Include financial support via tax credits or deductions, grants, subsidized loans, and loan guarantees.

Exclude research and other innovation activities conducted entirely for the public sector under contract.

Mark (✓) appropriate box.

	YES	NO	LN NO
1. Local government unit	1 <input type="checkbox"/>	2 <input type="checkbox"/>	17
2. National government (Including National Government Agencies or Departments)	1 <input type="checkbox"/>	2 <input type="checkbox"/>	18
3. Foreign government	1 <input type="checkbox"/>	2 <input type="checkbox"/>	19

9. SOURCES OF INFORMATION AND CO-OPERATION FOR INNOVATION ACTIVITIES**A. Since January 2015, did this establishment engage in the following innovation activities:**

Identify information sources that provide information for new innovation projects or contributed to the competition of existing innovation projects.

Mark (✓) appropriate box. Mark (✓) in column "4" if no information was obtained from a source.

Source.

Information Source		Degree of Importance				LN NO
		Rate using the following:				
		1 – High 2 – Medium	3 – Low 4 – Not Used	1	2	3
1. Internal	a. Within this establishment or enterprise	1 <input type="checkbox"/>	2 <input type="checkbox"/>	3 <input type="checkbox"/>	4 <input type="checkbox"/>	01
2. Market source	a. Suppliers of equipment, materials, components, or software	1 <input type="checkbox"/>	2 <input type="checkbox"/>	3 <input type="checkbox"/>	4 <input type="checkbox"/>	02
	b. Clients or customers	1 <input type="checkbox"/>	2 <input type="checkbox"/>	3 <input type="checkbox"/>	4 <input type="checkbox"/>	03
	c. Competitors or other establishments in its sector	1 <input type="checkbox"/>	2 <input type="checkbox"/>	3 <input type="checkbox"/>	4 <input type="checkbox"/>	04
	d. Consultants, commercial laboratories, or private R&D institutes	1 <input type="checkbox"/>	2 <input type="checkbox"/>	3 <input type="checkbox"/>	4 <input type="checkbox"/>	05
3. Institutional source	a. Universities or other higher education institutions	1 <input type="checkbox"/>	2 <input type="checkbox"/>	3 <input type="checkbox"/>	4 <input type="checkbox"/>	06
	b. Government or public research institutes	1 <input type="checkbox"/>	2 <input type="checkbox"/>	3 <input type="checkbox"/>	4 <input type="checkbox"/>	07
4. Other source	a. Conferences, trade fairs, exhibitions	1 <input type="checkbox"/>	2 <input type="checkbox"/>	3 <input type="checkbox"/>	4 <input type="checkbox"/>	08
	b. Scientific journals and trade/technical publications	1 <input type="checkbox"/>	2 <input type="checkbox"/>	3 <input type="checkbox"/>	4 <input type="checkbox"/>	09
	c. Professional and industry associations	1 <input type="checkbox"/>	2 <input type="checkbox"/>	3 <input type="checkbox"/>	4 <input type="checkbox"/>	10

B. Since January 2015, did this establishment co-operate with other establishments or non-commercial institutions on any of its innovation activities?

Innovation co-operation is active participation with other establishment or non-commercial institutions on innovation activities. Both partners do not need to commercially benefit.

Exclude pure subcontracting of work with no active co-operation.

Mark (✓) appropriate box.

1 ☐ YES 2 ☐ NOLN
NO

11

If NO, go to Item 10A. Otherwise, proceed to Item 9C.

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Page 8		PLEASE ENTER ON THE APPROPRIATE SPACE OR BOX THE DATA REQUESTED		
9. SOURCES OF INFORMATION AND CO-OPERATION FOR INNOVATION ACTIVITIES (cont.)				
C. What type of co-operation partner is this establishment involved with and where is it located?				
<i>Mark (✓) applicable box/es. Specify the country/ies for "Other ASEAN" and "All other country/ies".</i>				
Type of Co-operation Partner	Philippines	Other ASEAN Specify	All other country/ies Specify	LN NO
1. Other establishments within its enterprise	1 <input type="checkbox"/>	2 <input type="checkbox"/> _____ _____ _____	3 <input type="checkbox"/> _____ _____ _____	12
2. Suppliers of equipment, materials, components, or software	1 <input type="checkbox"/>	2 <input type="checkbox"/> _____ _____ _____	3 <input type="checkbox"/> _____ _____ _____	13
3. Clients or customers from the private sector	1 <input type="checkbox"/>	2 <input type="checkbox"/> _____ _____ _____	3 <input type="checkbox"/> _____ _____ _____	14
4. Clients or customers from the public sector	1 <input type="checkbox"/>	2 <input type="checkbox"/> _____ _____ _____	3 <input type="checkbox"/> _____ _____ _____	15
5. Competitors or other establishments in its sector	1 <input type="checkbox"/>	2 <input type="checkbox"/> _____ _____ _____	3 <input type="checkbox"/> _____ _____ _____	16
6. Consultants, commercial laboratories, or private R&D institutes	1 <input type="checkbox"/>	2 <input type="checkbox"/> _____ _____ _____	3 <input type="checkbox"/> _____ _____ _____	17
7. Universities or other higher education institutions	1 <input type="checkbox"/>	2 <input type="checkbox"/> _____ _____ _____	3 <input type="checkbox"/> _____ _____ _____	18
8. Government or public research institutes	1 <input type="checkbox"/>	2 <input type="checkbox"/> _____ _____ _____	3 <input type="checkbox"/> _____ _____ _____	19
				LN NO
D. Which type of co-operation partner did this establishment find the most valuable for its innovation activities? <i>Report the corresponding number of the co-operation partner from the list in Item 9C.</i>				20

Continued on Page 9

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10. EFFECTS OF INNOVATION**A. How does this establishment perceive the effects of its product and process innovations introduced since January 2015?**

Mark (✓) appropriate box.

Effects of the Product and Process Innovation		Degree of Perceived Effects				LN NO
		Rate using the following:				
		1 – High 2 – Medium		3 – Low 4 – Not Relevant		
		1	2	3	4	
1. Product-oriented effects	a. Increased range of goods or services	1 <input type="checkbox"/>	2 <input type="checkbox"/>	3 <input type="checkbox"/>	4 <input type="checkbox"/>	01
	b. Entered new markets or increased market share	1 <input type="checkbox"/>	2 <input type="checkbox"/>	3 <input type="checkbox"/>	4 <input type="checkbox"/>	02
	c. Improved quality of goods and services	1 <input type="checkbox"/>	2 <input type="checkbox"/>	3 <input type="checkbox"/>	4 <input type="checkbox"/>	03
2. Process-oriented effects	a. Improved flexibility of production or service provision	1 <input type="checkbox"/>	2 <input type="checkbox"/>	3 <input type="checkbox"/>	4 <input type="checkbox"/>	04
	b. Increased capacity of production or service provision	1 <input type="checkbox"/>	2 <input type="checkbox"/>	3 <input type="checkbox"/>	4 <input type="checkbox"/>	05
	c. Reduced labor costs per unit output	1 <input type="checkbox"/>	2 <input type="checkbox"/>	3 <input type="checkbox"/>	4 <input type="checkbox"/>	06
	d. Reduced materials and energy per unit output	1 <input type="checkbox"/>	2 <input type="checkbox"/>	3 <input type="checkbox"/>	4 <input type="checkbox"/>	07
3. Other effects	a. Reduced environmental impacts or improved health and safety	1 <input type="checkbox"/>	2 <input type="checkbox"/>	3 <input type="checkbox"/>	4 <input type="checkbox"/>	08
	b. Met regulatory requirements	1 <input type="checkbox"/>	2 <input type="checkbox"/>	3 <input type="checkbox"/>	4 <input type="checkbox"/>	09

11. FACTORS HAMPERING INNOVATION ACTIVITIES**A. Since January 2015, were any of the innovation activities or projects of this establishment...**

Mark (✓) appropriate box.

	YES	NO	LN NO
1. Abandoned in the concept stage	1 <input type="checkbox"/>	2 <input type="checkbox"/>	01
2. Abandoned after the activity or project had begun	1 <input type="checkbox"/>	2 <input type="checkbox"/>	02
3. Delayed seriously	1 <input type="checkbox"/>	2 <input type="checkbox"/>	03

B. Since January 2015, how important were the following factors for hampering innovation activities of projects or influencing a decision not to innovate of this establishment?

Mark (✓) appropriate box.

Factors Hampering Innovation Activities		Degree of Importance				LN NO
		Rate using the following:				
		1 – High 2 – Medium	3 – Low 4 – Factor not experienced			
		1	2	3	4	
1. Cost factors	a. Lack of funds within this establishment or enterprise	1 <input type="checkbox"/>	2 <input type="checkbox"/>	3 <input type="checkbox"/>	4 <input type="checkbox"/>	04
	b. Lack of finance from sources outside this establishment	1 <input type="checkbox"/>	2 <input type="checkbox"/>	3 <input type="checkbox"/>	4 <input type="checkbox"/>	05
	c. Innovation costs too high	1 <input type="checkbox"/>	2 <input type="checkbox"/>	3 <input type="checkbox"/>	4 <input type="checkbox"/>	06
2. Knowledge factors	a. Lack of qualified personnel	1 <input type="checkbox"/>	2 <input type="checkbox"/>	3 <input type="checkbox"/>	4 <input type="checkbox"/>	07
	b. Lack of information on technology	1 <input type="checkbox"/>	2 <input type="checkbox"/>	3 <input type="checkbox"/>	4 <input type="checkbox"/>	08
	c. Lack of information on markets	1 <input type="checkbox"/>	2 <input type="checkbox"/>	3 <input type="checkbox"/>	4 <input type="checkbox"/>	09
	d. Difficulty in finding cooperation partners for innovation	1 <input type="checkbox"/>	2 <input type="checkbox"/>	3 <input type="checkbox"/>	4 <input type="checkbox"/>	10
3. Market factors	a. Market dominated by established enterprises	1 <input type="checkbox"/>	2 <input type="checkbox"/>	3 <input type="checkbox"/>	4 <input type="checkbox"/>	11
	b. Uncertain demand for innovative goods or services	1 <input type="checkbox"/>	2 <input type="checkbox"/>	3 <input type="checkbox"/>	4 <input type="checkbox"/>	12
4. Reasons not to innovate	a. No need due to prior innovations	1 <input type="checkbox"/>	2 <input type="checkbox"/>	3 <input type="checkbox"/>	4 <input type="checkbox"/>	13
	b. No demand for innovations	1 <input type="checkbox"/>	2 <input type="checkbox"/>	3 <input type="checkbox"/>	4 <input type="checkbox"/>	14
5. Others, <i>specify</i> :		1 <input type="checkbox"/>	2 <input type="checkbox"/>	3 <input type="checkbox"/>	4 <input type="checkbox"/>	15

Continued on Page 10

12. INTELLECTUAL PROPERTY PROTECTION**A. Since January 2015, did this establishment ever apply for the following intellectual property protection instruments:**

Mark (✓) appropriate box.

	YES	NO	LN NO
1. Patent	1 <input type="checkbox"/>	2 <input type="checkbox"/>	01
2. Trademark	1 <input type="checkbox"/>	2 <input type="checkbox"/>	02
3. Copyright	1 <input type="checkbox"/>	2 <input type="checkbox"/>	03
4. Utility model registration	1 <input type="checkbox"/>	2 <input type="checkbox"/>	04
5. Design registration	1 <input type="checkbox"/>	2 <input type="checkbox"/>	05
6. Brand name	1 <input type="checkbox"/>	2 <input type="checkbox"/>	06
7. Others, <i>specify</i> : _____	1 <input type="checkbox"/>	2 <input type="checkbox"/>	07

B. If YES to any of the above, how important are the following in the decision of this establishment to innovate?

Mark (✓) appropriate box.

	Not Important	Important	Very Important	LN NO
1. Patent	1 <input type="checkbox"/>	2 <input type="checkbox"/>	3 <input type="checkbox"/>	08
2. Trademark	1 <input type="checkbox"/>	2 <input type="checkbox"/>	3 <input type="checkbox"/>	09
3. Copyright	1 <input type="checkbox"/>	2 <input type="checkbox"/>	3 <input type="checkbox"/>	10
4. Utility model registration	1 <input type="checkbox"/>	2 <input type="checkbox"/>	3 <input type="checkbox"/>	11
5. Design registration	1 <input type="checkbox"/>	2 <input type="checkbox"/>	3 <input type="checkbox"/>	12
6. Brand name	1 <input type="checkbox"/>	2 <input type="checkbox"/>	3 <input type="checkbox"/>	13
7. Others, <i>specify</i> : _____	1 <input type="checkbox"/>	2 <input type="checkbox"/>	3 <input type="checkbox"/>	14

C. If NO to any of the above, what are the possible reasons for this establishment in not applying for intellectual property protection?

Mark (✓) the applicable box/es.

	LN NO
1 <input type="checkbox"/> Too costly in terms of time and resources	15
2 <input type="checkbox"/> Not aware of the need	
3 <input type="checkbox"/> Others, <i>specify</i> : _____	

D. How effective were the following methods for maintaining or increasing the competitiveness of product and process innovations introduced by this establishment since January 2015?

Mark (✓) appropriate box.

Mark (✓) appropriate box.	Degree of Effectiveness				LN NO
Method	Rate using the following:				
	1 – High	2 – Medium	3 – Low	4 – Not Used	
	1		2		
1. Patents	1 <input type="checkbox"/>	2 <input type="checkbox"/>	3 <input type="checkbox"/>	4 <input type="checkbox"/>	16
2. Utility model registration	1 <input type="checkbox"/>	2 <input type="checkbox"/>	3 <input type="checkbox"/>	4 <input type="checkbox"/>	17
3. Design registration	1 <input type="checkbox"/>	2 <input type="checkbox"/>	3 <input type="checkbox"/>	4 <input type="checkbox"/>	18
4. Copyright	1 <input type="checkbox"/>	2 <input type="checkbox"/>	3 <input type="checkbox"/>	4 <input type="checkbox"/>	19
5. Trademarks	1 <input type="checkbox"/>	2 <input type="checkbox"/>	3 <input type="checkbox"/>	4 <input type="checkbox"/>	20
6. Lead time advantages	1 <input type="checkbox"/>	2 <input type="checkbox"/>	3 <input type="checkbox"/>	4 <input type="checkbox"/>	21
7. Complexity of goods or services	1 <input type="checkbox"/>	2 <input type="checkbox"/>	3 <input type="checkbox"/>	4 <input type="checkbox"/>	22
8. Secrecy (include non-disclosure agreement)	1 <input type="checkbox"/>	2 <input type="checkbox"/>	3 <input type="checkbox"/>	4 <input type="checkbox"/>	23

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13. ORGANIZATIONAL INNOVATION

An organizational innovation is the implementation of a new organizational method in the business practices, workplace organization or external relations of this establishment.

- It must be the result of strategic decisions taken by management.
- Exclude mergers or acquisitions, even if for the first time. Mergers and acquisitions may involve organizational innovations, however, if the establishment develops or adopts new organization methods in the course of the merger or acquisition.

A. Compared to other foreign-based establishment of a similar size and sector, how close was the organizational structure of this establishment to international best practice.

Best practice is defined as an organizational structure that maximized productivity, quality and customer service.

Mark (✓) appropriate box.

		LN NO
1 <input type="checkbox"/> Close to or at best practice	4 <input type="checkbox"/> Below average	01
2 <input type="checkbox"/> Above average	5 <input type="checkbox"/> Well below average	
3 <input type="checkbox"/> Average	6 <input type="checkbox"/> Do not know	

B. Since January 2015, did this establishment introduce...

Mark (✓) appropriate box.

Organizational Innovation	YES	NO	LN NO
1. New or significantly improved knowledge management systems to better use or exchange information, knowledge and skills within this establishment	1 <input type="checkbox"/>	2 <input type="checkbox"/>	02
2. New management systems for the production and/or supply operations of this establishment	1 <input type="checkbox"/>	2 <input type="checkbox"/>	03
3. Significant changes to the organization of work in this establishment that:			
a. Increased employee decision making and responsibility for their work	1 <input type="checkbox"/>	2 <input type="checkbox"/>	04
b. Decreased employee decision making and responsibility for their work	1 <input type="checkbox"/>	2 <input type="checkbox"/>	05
c. Had no effect on employee decision making and responsibilities	1 <input type="checkbox"/>	2 <input type="checkbox"/>	06
4. A significant change to the management structure of this establishment, such as creating new divisions or departments, integrating different departments or activities, adoption of a networked structure, etc.	1 <input type="checkbox"/>	2 <input type="checkbox"/>	07
5. New or significant changes in its relations with other establishments or public institutions, such as through alliances, partnerships, outsourcing or sub-contracting	1 <input type="checkbox"/>	2 <input type="checkbox"/>	08

If NO to all organizational innovation, go to Item 13G. Otherwise, proceed to Item 13C.

C. What was the source of the ideas for the organizational innovations of this establishment?

Mark (✓) appropriate box.

		LN NO
1 <input type="checkbox"/> Mainly this establishment	3 <input type="checkbox"/> Other establishments or institutions	09
2 <input type="checkbox"/> This establishment together with its main office and/or establishment within the enterprise		

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13. ORGANIZATIONAL INNOVATION (cont.)

D. How does this establishment perceive the effects of its organizational innovations introduced since January 2015?

If this establishment introduced several organizational innovations, make an overall evaluation.

Mark (✓) appropriate box.

Effects of the Organizational Innovation of this Establishment	Degree of Perceived Effects				LN NO
	Rate using the following:				
	1 – High 2 – Medium	3 – Low 4 – Not Relevant			
	1	2	3	4	
1. Reduced time to respond to customer or supplier needs	1 <input type="checkbox"/>	2 <input type="checkbox"/>	3 <input type="checkbox"/>	4 <input type="checkbox"/>	10
2. Improved quality of goods or services	1 <input type="checkbox"/>	2 <input type="checkbox"/>	3 <input type="checkbox"/>	4 <input type="checkbox"/>	11
3. Reduced costs per unit output	1 <input type="checkbox"/>	2 <input type="checkbox"/>	3 <input type="checkbox"/>	4 <input type="checkbox"/>	12
4. Improved employee satisfaction and/or lower employee turnover	1 <input type="checkbox"/>	2 <input type="checkbox"/>	3 <input type="checkbox"/>	4 <input type="checkbox"/>	13
5. Improved communication or information sharing	1 <input type="checkbox"/>	2 <input type="checkbox"/>	3 <input type="checkbox"/>	4 <input type="checkbox"/>	14
6. Increased ability to develop new products or processes	1 <input type="checkbox"/>	2 <input type="checkbox"/>	3 <input type="checkbox"/>	4 <input type="checkbox"/>	15
7. Others, <i>specify</i> : _____	1 <input type="checkbox"/>	2 <input type="checkbox"/>	3 <input type="checkbox"/>	4 <input type="checkbox"/>	16

E. Approximately what percent of total employment were directly affected by its organizational innovation in 2015?

Report the percent of total employment directly affected in the organizational innovation of this establishment in the box provided.

 %

F. Were any of these organizational innovations essential to the implementation of other types of innovation introduced by this establishment in 2015?

Mark (✓) the appropriate box. Mark (✓) in column "Not Relevant" if this establishment did NOT introduce any of the following innovations.

Types of Innovation	YES	NO	Not Relevant	LN NO
1. Product innovation for a new or improved good	1 <input type="checkbox"/>	2 <input type="checkbox"/>	3 <input type="checkbox"/>	18
2. Product innovation for a new or improved service	1 <input type="checkbox"/>	2 <input type="checkbox"/>	3 <input type="checkbox"/>	19
3. Process innovation	1 <input type="checkbox"/>	2 <input type="checkbox"/>	3 <input type="checkbox"/>	20

G. Why did this establishment not introduce an organizational innovation since January 2015?

Mark (✓) appropriate box.

Reasons for Not Introducing Organizational Innovation	YES	NO	LN NO
1. Organizational innovations were introduced before January 2015 and no need for further change	1 <input type="checkbox"/>	2 <input type="checkbox"/>	21
2. Lack of funds or staff to implement an organizational innovation	1 <input type="checkbox"/>	2 <input type="checkbox"/>	22
3. Resistance of staff or management to organizational change	1 <input type="checkbox"/>	2 <input type="checkbox"/>	23

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14. MARKETING INNOVATION

A marketing innovation is the implementation of a new marketing method involving significant changes in product design or packaging product placement, product promotion or pricing.

A. Since January 2015, has this establishment introduced the following marketing innovations:

Mark (✓) appropriate box.

Types of Marketing Innovation		YES	NO	LN NO
1. Design	a. Introduce significant changes to the <u>design</u> of a good or service (Exclude routine/seasonal changes such as clothing fashions)	1 <input type="checkbox"/>	2 <input type="checkbox"/>	01
	b. Introduce significant changes to the <u>packaging</u> of a good	1 <input type="checkbox"/>	2 <input type="checkbox"/>	02
2. Promotion	a. Implement a new marketing strategy to <u>target new customer groups or market segments</u>	1 <input type="checkbox"/>	2 <input type="checkbox"/>	03
	b. Use <u>new media or techniques to promote products</u> , such as new advertising concepts, a new brand image or new techniques to customize promotion to individual customers or groups	1 <input type="checkbox"/>	2 <input type="checkbox"/>	04
3. Placement	a. Use <u>new sales channels</u> , such as direct selling, internet sales, or product licensing	1 <input type="checkbox"/>	2 <input type="checkbox"/>	05
	b. Introduce new concepts for <u>product presentation</u> in sales outlets (e.g. sales rooms, websites, other types of outlets)	1 <input type="checkbox"/>	2 <input type="checkbox"/>	06
4. Pricing	a. Use <u>new pricing methods</u> to market goods or services	1 <input type="checkbox"/>	2 <input type="checkbox"/>	07

If NO to all marketing innovation, go to Item 15. Otherwise, proceed to Item 14B.

B. Which unit developed these marketing innovations?

Mark (✓) appropriate box.

			LN NO
1 <input type="checkbox"/>	Mainly this establishment	3 <input type="checkbox"/>	08
2 <input type="checkbox"/>	This establishment together with its main office and/or establishment within the enterprise	Other establishments or institutions	

C. How does this establishment perceive the effects of its marketing innovations since January 2015?

If this establishment introduced several marketing innovations, make an overall evaluation.

Mark (✓) appropriate box.

Effects of Marketing Innovation	Degree of Perceived Effects				LN NO
	Rate using the following:				
	1 – High 2 – Medium	3 – Low 4 – None/Not Relevant			
	1	2	3	4	
1. Sales growth for its goods and services	1 <input type="checkbox"/>	2 <input type="checkbox"/>	3 <input type="checkbox"/>	4 <input type="checkbox"/>	09
2. Increased visibility of products or business	1 <input type="checkbox"/>	2 <input type="checkbox"/>	3 <input type="checkbox"/>	4 <input type="checkbox"/>	10
3. Strengthened relationships with customers	1 <input type="checkbox"/>	2 <input type="checkbox"/>	3 <input type="checkbox"/>	4 <input type="checkbox"/>	11
4. Improved customer satisfaction	1 <input type="checkbox"/>	2 <input type="checkbox"/>	3 <input type="checkbox"/>	4 <input type="checkbox"/>	12
5. Others, <i>specify</i> : _____	1 <input type="checkbox"/>	2 <input type="checkbox"/>	3 <input type="checkbox"/>	4 <input type="checkbox"/>	13

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14. MARKETING INNOVATION (cont.)

D. Since January 2015, how important were the following market-related activities for the innovation projects of this establishment?

Mark (✓) appropriate box.

Market-Related Activities	Degree of Importance				LN NO
	Rate using the following:				
	1 – High 2 – Medium	3 – Low 4 – None/Not Used			
	1	2	3	4	
1. Maintaining close links between its marketing department and departments or groups involved in developing or implementing its innovations	1 <input type="checkbox"/>	2 <input type="checkbox"/>	3 <input type="checkbox"/>	4 <input type="checkbox"/>	14
2. Systematic analysis by its marketing division of the needs of its customer	1 <input type="checkbox"/>	2 <input type="checkbox"/>	3 <input type="checkbox"/>	4 <input type="checkbox"/>	15
3. Systematic analysis of the effectiveness of its marketing techniques	1 <input type="checkbox"/>	2 <input type="checkbox"/>	3 <input type="checkbox"/>	4 <input type="checkbox"/>	16
4. Others, <i>specify</i> : _____	1 <input type="checkbox"/>	2 <input type="checkbox"/>	3 <input type="checkbox"/>	4 <input type="checkbox"/>	17

E. If this establishment introduced a marketing and product innovation since January 2015...

Mark (✓) appropriate box.

	YES	NO	LN NO
1. Were any of these marketing innovations an integral part of any of the product innovations of this establishment? For example, a design change was an essential part of a technical innovation, or a new marketing method was part of a process innovation	1 <input type="checkbox"/>	2 <input type="checkbox"/>	18
2. Were any of these marketing innovations <u>necessary</u> for the successful introduction of the product innovation/s of this establishment?	1 <input type="checkbox"/>	2 <input type="checkbox"/>	19

15. PUBLIC SECTOR PROCUREMENT AND INNOVATION

A. Did this establishment undertake any innovation activities as part of a procurement contract to provide goods or services to a public sector organization?

Include activities for product, process, organizational and marketing innovations.

The public sector includes government owned organizations such as local, regional and national administrations and agencies, schools, hospitals, and government provides of services such as security, transport, housing, energy, etc.

Mark (✓) appropriate box.

	LN NO
1 <input type="checkbox"/> Yes and innovation required as part of the contract	01
2 <input type="checkbox"/> Yes but innovation not required as part of the contract	
3 <input type="checkbox"/> No	

16. REGISTRATION WITH INVESTMENT PROMOTION AGENCIES

A. Is this establishment currently registered or ever been registered with any of the investment promotion agencies (IPA)?

Mark (✓) appropriate box. If YES, indicate the year of registration.

	YES	Year of Registration	NO	LN NO
1. Board of Investment	1 <input type="checkbox"/>	_____	2 <input type="checkbox"/>	01
2. Philippine Export Zone Authority	1 <input type="checkbox"/>	_____	2 <input type="checkbox"/>	02
3. Others, <i>specify</i> : _____	1 <input type="checkbox"/>	_____	2 <input type="checkbox"/>	03

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16. REGISTRATION WITH INVESTMENT PROMOTION AGENCIES (cont.)

B. Which of the following financial and other incentives has this establishment ever availed of since its registration with any of the above-mentioned IPAs? How about in 2015?

Mark (✓) applicable box/es.

Financial and Other Incentives	Ever Since Registration	2015	LN NO
1. Income tax holiday	1 <input type="checkbox"/>	2 <input type="checkbox"/>	04
2. Tax deduction	1 <input type="checkbox"/>	2 <input type="checkbox"/>	05
3. Duty free importation of raw materials inputs	1 <input type="checkbox"/>	2 <input type="checkbox"/>	06
4. Duty free importation of equipment and other capital inputs	1 <input type="checkbox"/>	2 <input type="checkbox"/>	07
5. VAT exemption/credits for raw material inputs	1 <input type="checkbox"/>	2 <input type="checkbox"/>	08
6. VAT exemption/credits for equipment and other capital inputs	1 <input type="checkbox"/>	2 <input type="checkbox"/>	09
7. Direct subsidy	1 <input type="checkbox"/>	2 <input type="checkbox"/>	10
8. Subsidized loan	1 <input type="checkbox"/>	2 <input type="checkbox"/>	11
9. Loan guarantees	1 <input type="checkbox"/>	2 <input type="checkbox"/>	12
10. Others, <i>specify</i> : _____	1 <input type="checkbox"/>	2 <input type="checkbox"/>	13

C. How does this establishment perceive the importance of financial and other incentives given by the IPAs?

Mark (✓) appropriate box.

Financial and Other Incentives	Degree of Importance				LN NO
	Rate using the following:				
	1 – High 2 – Medium	3 – Low 4 – Not used			
	1	2	3	4	
1. Income tax holiday	1 <input type="checkbox"/>	2 <input type="checkbox"/>	3 <input type="checkbox"/>	4 <input type="checkbox"/>	14
2. Tax deduction	1 <input type="checkbox"/>	2 <input type="checkbox"/>	3 <input type="checkbox"/>	4 <input type="checkbox"/>	15
3. Duty free importation of raw materials inputs	1 <input type="checkbox"/>	2 <input type="checkbox"/>	3 <input type="checkbox"/>	4 <input type="checkbox"/>	16
4. Duty free importation of equipment and other capital inputs	1 <input type="checkbox"/>	2 <input type="checkbox"/>	3 <input type="checkbox"/>	4 <input type="checkbox"/>	17
5. VAT exemption/credits for raw material inputs	1 <input type="checkbox"/>	2 <input type="checkbox"/>	3 <input type="checkbox"/>	4 <input type="checkbox"/>	18
6. VAT exemption/credits for equipment and other capital inputs	1 <input type="checkbox"/>	2 <input type="checkbox"/>	3 <input type="checkbox"/>	4 <input type="checkbox"/>	19
7. Direct subsidy	1 <input type="checkbox"/>	2 <input type="checkbox"/>	3 <input type="checkbox"/>	4 <input type="checkbox"/>	20
8. Subsidized loan	1 <input type="checkbox"/>	2 <input type="checkbox"/>	3 <input type="checkbox"/>	4 <input type="checkbox"/>	21
9. Loan guarantees	1 <input type="checkbox"/>	2 <input type="checkbox"/>	3 <input type="checkbox"/>	4 <input type="checkbox"/>	22
10. Others, <i>specify</i> : _____	1 <input type="checkbox"/>	2 <input type="checkbox"/>	3 <input type="checkbox"/>	4 <input type="checkbox"/>	23

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17. KNOWLEDGE MANAGEMENT

Knowledge management involves activities related to the capture, use and sharing of knowledge by the organization. It involves the management both of external linkages and of knowledge flows within the establishment, including methods and procedures for seeking external knowledge and for establishing closer relationships with other establishments (suppliers, competitors), customers or research institutions.

A. Has this establishment used any of the following knowledge management practices since January 2015?

Mark (✓) appropriate box.

Knowledge Management Practices	YES	NO	LN NO
1. A written knowledge management policy	1 <input type="checkbox"/>	2 <input type="checkbox"/>	01
2. Incentives for employees to share knowledge within this establishment	1 <input type="checkbox"/>	2 <input type="checkbox"/>	02
3. Dedicated resources to monitor and obtain knowledge from outside this establishment	1 <input type="checkbox"/>	2 <input type="checkbox"/>	03
4. A policy to bring in external experts from universities, research institutes, or other establishments to participate in project teams, as needed	1 <input type="checkbox"/>	2 <input type="checkbox"/>	04
5. Regular updates of internal databases or manuals of good work practices, lessons learned, or expert advice	1 <input type="checkbox"/>	2 <input type="checkbox"/>	05

18. GOVERNMENT INNOVATION-RELATED POLICIES

A. Does this establishment know of any government innovation policies or initiatives?

YES NO LN NO
1 ☐ 2 ☐ 01

Mark (✓) appropriate box.

If NO, go to Item 18D. Otherwise, proceed to Item 18B.

B. Has this establishment availed of any government support or assistance in its innovation activity since January 2015?

YES NO Do Not Know LN NO
1 ☐ 2 ☐ 3 ☐ 02

Mark (✓) appropriate box.

If NO or DO NOT KNOW, go to Item 18D. Otherwise, proceed to Item 18C.

C. How does this establishment perceive the importance of the following government support programs for its innovations since January 2015?

Mark (✓) appropriate box.

Mark (✓) appropriate box.	Degree of Importance				LN NO
	Rate using the following:				
	1 – High 2 – Medium	3 – Low 4 – None/Not used			
Programs	1	2	3	4	
1. R&D funding	1 <input type="checkbox"/>	2 <input type="checkbox"/>	3 <input type="checkbox"/>	4 <input type="checkbox"/>	03
2. Training	1 <input type="checkbox"/>	2 <input type="checkbox"/>	3 <input type="checkbox"/>	4 <input type="checkbox"/>	04
3. Direct subsidies	1 <input type="checkbox"/>	2 <input type="checkbox"/>	3 <input type="checkbox"/>	4 <input type="checkbox"/>	05
4. Tax deduction	1 <input type="checkbox"/>	2 <input type="checkbox"/>	3 <input type="checkbox"/>	4 <input type="checkbox"/>	06
5. Tax credits	1 <input type="checkbox"/>	2 <input type="checkbox"/>	3 <input type="checkbox"/>	4 <input type="checkbox"/>	07
6. Tax holiday	1 <input type="checkbox"/>	2 <input type="checkbox"/>	3 <input type="checkbox"/>	4 <input type="checkbox"/>	08
7. Duty free importation	1 <input type="checkbox"/>	2 <input type="checkbox"/>	3 <input type="checkbox"/>	4 <input type="checkbox"/>	09
8. Technical support/advice	1 <input type="checkbox"/>	2 <input type="checkbox"/>	3 <input type="checkbox"/>	4 <input type="checkbox"/>	10
9. Infrastructure support	1 <input type="checkbox"/>	2 <input type="checkbox"/>	3 <input type="checkbox"/>	4 <input type="checkbox"/>	11
10. Subsidized loans	1 <input type="checkbox"/>	2 <input type="checkbox"/>	3 <input type="checkbox"/>	4 <input type="checkbox"/>	12
11. Loan guarantees	1 <input type="checkbox"/>	2 <input type="checkbox"/>	3 <input type="checkbox"/>	4 <input type="checkbox"/>	13
12. Others, <i>specify</i> :	1 <input type="checkbox"/>	2 <input type="checkbox"/>	3 <input type="checkbox"/>	4 <input type="checkbox"/>	14

Continued on Page 17

PLEASE ENTER ON THE APPROPRIATE SPACE OR BOX THE DATA REQUESTED				Page 17
18. GOVERNMENT INNOVATION-RELATED POLICIES <i>(cont.)</i>				
D. What are the suggestions of this establishment on how the government can encourage innovation in this establishment?				LN NO
<div><div></div><div></div><div></div><div></div><div></div></div>				15
19. REMARKS				
<div></div>				
20. OTHER INFORMATION				
I hereby certify that this report for the period _____ to _____ has been completed as accurately as the records of this establishment allow and with the best estimates in some instances.				
Name _____		Signature _____		
Position Title _____		Date _____		
21. CONTACT PERSON				
Person to be contacted for queries regarding this form:				
Name _____				
Position Title _____				
Address _____				
Tel. No. _____		Fax No. _____		
Email Address _____				
DO NOT FILL (FOR PSA USE ONLY)				
Activity	Name	Signature	Number of Items	Date
Field Office:				
Distributed by				
Collected by				
Field Edited by				
Manually Edited by				
Central Office:				
Edited/Coded by				
Verified by				

THANK YOU FOR ACCOMPLISHING THIS FORM!

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Innovation involves implementing new or significantly improved goods and services, production processes, marketing, or organizational methods for adding value. The measurement of innovation provides a mechanism for benchmarking national performance, as well as allows a better understanding of its relation to economic growth. Further, examining determinants and bottlenecks to innovation among firms provides inputs to mainstreaming of policies on innovation. In this paper, results of the 2015 Survey of Innovation Activities, conducted by the Philippine Institute for Development Studies, are described and discussed. Survey results suggest that less than half of the firms in the country were innovators, with larger-sized firms innovating more than the micro, small, and medium establishments. The most common innovative behavior among firms was process innovation. Effects of innovation were observed to be largely customer-driven. Firms identified cost factors as the most important barrier to innovation. Knowledge and cooperation networks for innovation need strengthening. Government support and its role on innovation was also limited. Firms hardly accessed technical assistance from the government and research institutions. Similarly, firms have limited cooperation with the academe in terms of innovation activities. Firms cooperated more internally with establishments within their enterprise, their customers, and suppliers for their innovation activities. Given these issues, the government needs to have a champion for developing stronger policies and interventions to support and encourage innovation. It is also important to improve information dissemination regarding public programs available to assist firms to pursue innovation. Networking, linkages, and collaboration among the government, industry associations, and universities and research institutions also require further enhancement.