Measuring Outsourced Manufacturing Process in India – its Relevance in National Accounts Compilation

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Abstract

Outsourcing manufacturing processes involves three kinds of manufacturing units. The 'principals' outsource parts of or complete production process to 'contractors' or 'job work units'(JWUs), while the ownership of the physical raw materials as well as the output lies with the former. There is another category of players, called 'agents' in the present study. An agent takes delivery of raw materials from a principal and engages JWUs to get the job done. The study attempts to measure the prevalence of and changes in outsourcing activities in different non-repairing manufacturing activities, in terms of their shares in total number of units, workforce and contribution to domestic product. The estimates for the combined registered and unregistered segments of the manufacturing sector, used for this purpose, are derived from the data drawn from the Annual Survey of Industries (ASI) and the Enterprise Survey (ES) of the NSSO. Based on these estimates, representing the entire manufacturing sector, the present paper examines certain issues of relevance in the context of compilation of national accounts. It demonstrates possible presence of under-coverage, misclassification and reporting bias that are likely to affect the estimates of domestic product. It also examines the treatment of outsourced manufacturing processes in Input-Output Transaction Tables (IOTT) compilation and, as a result, likely overestimation of private final consumption expenditure (PFCE) on products of manufacturing industries featuring significant outsourcing activities. In conclusion, the paper stresses on the need of developing methods of collecting data on production and use of manufacturing services, in general, and job work, in particular, for measuring outsourcing activities in Indian manufacturing.

I. Introduction

1.1 Driven by the economic liberalisation policies adopted since the early 1990s and the modern phase of globalisation, the practice of business outsourcing has grown rapidly in the last two decades. Existing literature deals extensively on the issues of domestic businesses' growth and advantages of the foreign companies providing offshore assignments that mostly operate in the service-sector industries, such as finance, banking, information technology, and tele-communication. But, outsourcing of manufacturing processes, whether contracted within the domestic economy or with overseas parties, has so far drawn only a little attention.

1.2 Indian manufacturing is characterised by presence of a very large unorganised segment. What is even more significant is that over a third of the manufacturing sector

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workforce (Item1,*Table1*) is exclusively engaged in providing manufacturing services, which is defined as the services of transforming physical inputs owned by units other than the units carrying out the transformation. Such services of transforming supplied materials, if provided on contract by other enterprises, typically represent outsourcing of manufacturing processes. The rest of the manufacturing services are mainly carried out for direct consumption of the households.

1.3 There is a limited number of studies on production of manufacturing services in the Indian context. Banga and Goldar (2004) investigate the impact of services inputs on output growth, but it relates to only the organised segment of the manufacturing sector (registered factories) and is severely constrained by absence of data on manufacturing services input. Sahu (2007, 2011) examines the incidence and characteristic features of subcontracting firms among small and micro manufacturing enterprises, based on primary data collected through field survey and secondary data of Unorganised Manufacturing Enterprises Survey conducted in the 56th (2000-01) and 62nd (2005-06) rounds of NSSO. These studies adopt 'working on contract' as the criterion for identifying the subcontracting firms and explore the problems and prospects of such enterprises. Vishnu Kumar *et. al.* (2007), Chaudhury *et. al.* (2008) and Basole *et. al.* (2014) have identified substantial presence of manufacturing service producers (*MSP*s) in the unregistered segment of the manufacturing sector, based on respectively 56th round and 62nd round surveys of the NSSO. Vishnu Kumar *et. al.* (2007) and Chaudhury *et. al.* (2008) use a set of criteria involving receipts of service charges and absence of physical output, in addition to 'working on contract', for identifying such manufacturing service producing units, which also comprise the subcontracting firms. Vishnu Kumar *et. al.* (2007) dwells mainly with the implications of not distinguishing manufacturing services from other manufacturing activities in estimating sectoral distribution of domestic product.

1.4 The domain of all the studies cited above is confined to either the organised or unorganised segment of the manufacturing sector. Measuring the prevalence of outsourcing in India's manufacturing, on the other hand, requires a comprehensive account of the level and trend in production of manufacturing services for the manufacturing sector as a whole. In view of that, the present paper attempts to measure the share of outsourced manufacturing activities in domestic production and examines the methodological aspects relating to its treatment in compilation of national accounts aggregates relating to production and final use. The basic data used for this purpose are drawn from the Annual Survey of Industries (ASI) and the Enterprise Surveys (ES) of the NSSO covering manufacturing sector for 2000-01 and 2010-11. The pooled data from these two sources virtually represents the Indian manufacturing in its entirety[3].

1.5 Outsourcing manufacturing processes has been an established practice in India since long. At present, it is found to be quite common in both traditional as well as high-skill industries. In fact, contrary to the observed growth of outsourcing in the service-sector

[3] The ES of the 67th Round of NSSO, conducted in 2010-11, in fact excluded the manufacturing establishments belonging to the corporate sector. However, according to the Fourth All-India Census of Micro, Small and Medium Enterprises (2006-07) only a negligibly few (just about a thousand) unregistered manufacturing units belonged to private companies. (Ministry of Micro, Small and Medium Enterprises, 2008)

industries, the results of recent surveys on manufacturing industries① reflect a sharp decline in relative importance of outsourcing of manufacturing process in the first decade of the present millennium.

1.6 The indicators and ratios presented in *Table 1* reflect the changing importance of outsourcing of manufacturing processes in India. While the share of MSPs in workforce remained unchanged, that of JWUs declined sharply during the decade. Yet, the shares of manufacturing service providers (*MSP*s), in general, and job work units (*JWU*s) or *contract manufacturers*[4], in particular, in the gross value added (*GVA*) of manufacturing sector (excluding repairing services) show sharper decline during the period 2000-01 to 2010-11. Possibly, this owes mainly to shift towards relatively less remunerative activities of the un-registered *MSP* units apart from the evident decline in the share of *JWU*s in the workforce. The observed changes in material input-output ratios (Item 5, *Table 1*) may as well be attributed to changing relative prices rather than to any significant technological change. The ratio of receipts of manufacturing service charges to *value of goods output* (*VGO*) reflects the extent of outsourcing of manufacturing process[5]. For all non-repairing manufacturing activities, this ratio declined from 9.5% in 2000-01 to 6.6% in 2010-11.

1.7 Exploring for underlying factors for the decline in outsourcing activities is, however, beyond the scope of the present paper. Its main purpose is to bring certain measurement issues to the fore and examine their effects on estimates of national accounts aggregates. Though the level of outsourcing in manufacturing activities has been fairly low, the observed changes in its relative share may as well leave a marked effect on the growth rates of domestic production and consumption. The study in fact focuses on the three following compilation issues relating to outsourcing of manufacturing process in the Indian context:

(i) Possible presence of reporting bias affecting GVA estimates of manufacturing activities;

(ii) Methodological treatment of outsourced manufacturing processes in compilation of Input-Output Transaction Tables (IOTT); and

(iii) Likely overestimation of private final consumption expenditure (PFCE) of the products for which manufacturing activities feature significant outsourcing activities.

1.8 The rest of the paper is organized as follows. Section II provides a discussion on different forms of manufacturing services and defines the terms used in the paper for different kinds of players involved in outsourcing activities. Section III lays down the exact

[4] Contract manufacturers are the units carrying out job work for other enterprises. This is discussed in some more detail in Section II.

[5] Olsen (2006) cites a number of commonly used measures of offshore outsourcing. Of these, a 'narrow' measure of outsourcing developed by Feenstra and Hanson restricts the base to only those inputs – both goods and services - that are purchased from the same industry as that in which the good is being produced. A narrower measure of offshore outsourcing that is also used is restricted to outward processing. This measure includes only the intermediate exports for processing that are re-imported. The ratio used here is a measure of outsourcing (within and outside the domestic economy) of the second kind, which includes only the value of job work, i.e. the receipts for manufacturing (processing) services provided to other enterprises, as a component of the value of goods produced by the same industry as that of the service provider.

procedure of identifying the units providing, receiving and mediating manufacturing services, while clearly indicating the data from ASI and ES used for this purpose. To assess the importance of outsourcing in the manufacturing sector, Section IV examines the roles of *principals* (those who outsource), *MSP*s, *JWU*s and *agents* (the mediating agencies) in terms of their percentage shares in the number of units, workforce and gross value added (GVA) of the manufacturing sector. Next, Section V deals with prevalence of manufacturing services providing and outsourcing in individual manufacturing activities. This is followed by a discussion, in Section VI, on the reporting bias the estimates of payment for *job work* are possibly subject to. Then, in Section VII & VIII, the main attention shifts towards methodological aspects relating to use of data in compilation of national accounts. Section VII is a critical examination of how manufacturing services are treated in compilation of Input-Output Transaction Tables (IOTT) in India. That the present treatment may lead to overestimation of private consumption expenditure (PFCE) is illustrated in Section VIII. The concluding section summarizes some of the key findings of the study and suggests the data to be collected for developing an effective method of estimating value added of the job production related activities and adjustments required to be made in the estimates of final consumption of the resulting products.

II. Manufacturing Services – different forms

2.1 Manufacturing services comprise output of those manufacturing activities that are performed on the physical inputs owned by entities other than the units providing the service. Some manufacturing services such as custom tailoring and flour milling are provided directly to consumer households. Most of the other activities, such as bidi making, manufacture of all types of textile garments and clothing accessories, weaving, manufacture of cotton and cotton mixture fabrics, of the MSPs are carried out for other businesses. Often, these constitute the outsourced part of a total production process of another manufacturing firm.

2.2 Whether provided for final use of consumer households or intermediate use of other manufacturing firms, the activity of producing manufacturing services, according to the International Standard Industrial Classification (ISIC), is included in manufacturing. The ISIC, Rev.4, (UNSD 2008) identifies three forms of 'outsourcing', namely (a) outsourcing of support functions, (b) outsourcing of parts of the production process and (c) outsourcing of the complete production process. In form (a), the *principal* carries out the core production process (of a good or a service) but outsources certain support functions, such as accounting or computer services, to the *contractor*. In such cases, the contractor is not treated as a *MSP*. In case of both the forms (b) and (c), the *contractor* is invariably treated as a *MSP*, more specifically, a *Job Work Unit*, while the *principal* outsourcing the manufacturing activity is also treated as a manufacturer, if it owns the material inputs and thereby has economic ownership of the outputs.[6]

2.3 There are several terms, such as outsourcing, offshoring, sub-contracting, contract manufacturing, job production, that relate to *manufacturing services* in the literature.

[6]The *principal* is treated as a wholesaler if the material inputs are owned by the contractors and not by the *principal*.

'Outsourcing', in its broadest sense, refers to relocation of jobs and processes to external providers regardless of whether the raw material inputs are procured by the providers or supplied by the outsourcing firm. The principal production unit (the *principal*) contracts another production unit (the *contractor*) to carry out specific functions constituting the whole or a part of the *principal*'s activity of producing a good or a service. The external providers are called 'contract manufacturers' when the contracts are for component or products for further use in its production by the outsourcing firm. *Job production* is a kind of contract manufacturing where only a part of the production process is outsourced by the outsourcing firm. Nagraj (1984) categorises all 'contract manufacturing' as 'sub-contracting', which is a type of inter-firm relationship. Under sub-contracting, typically, a large firm procure manufactured products, on contract, from one or more small firms. Often, the parent firm provides necessary raw materials to the sub-contracted firm. In the present study, only the sub-contracting with the necessary (main) raw materials supplied by the parent firm is treated as job production.

2.4 The term *principal* used in this study is for only those units that outsources manufacturing process and supplies the main raw material to the *contractors*. Two other distinct terms, viz. 'manufacturing services' and 'job work', are used in a somewhat different connotation. It is important to note that the ownership of the physical raw materials does not lie with the *manufacturing service provider* (*MSP*) but with the one receiving the service, i.e. the *principal*. 'Job work' is a subset of manufacturing service where the material transformed by the *MSP* is used for further production by the outsourcing firm. In this study, the term 'job work' is used for all kinds of contract manufacturing carried out for a *principal*, outsourcing whole or part of its production processes. The activities of providing manufacturing services for intermediate use of the *principal* is called *job work* and the unit carrying out the job work is called a *job work unit* (*JWU*). The services provided directly to households for their final consumption as well as to other enterprises for capital formation are reckoned as merely *manufacturing services* and not as *job work*.

2.5 ILO (1996) distinguishes a category of self-employed individuals as 'home workers', who are in fact *contractors*. A self-employed individual to whom a job work is subcontracted under putting-out system is called a 'homeworker'. In fact, the 'homeworker' provides manufacturing services based on the specifications of the parent enterprise, which also supplies the raw material. Though the 'homeworkers' are often required to purchase, repair, and maintain their own tools or machines, or incur expenditure for some inputs and transportation, they neither bear the cost of the main raw materials nor market the final physical output, or negotiate its price. Besides the self-employed 'homeworkers', there are small establishments who work for *principals* under putting out system. All such units are treated as *JWU*s in this study.

2.6 There is another category of players in the context of outsourcing. They play the role of middlemen between the *principals* and *JWU*s. These units take delivery of raw materials from a *principal* and engage *JWU*s to get the job done. Such intermediary units are referred to as 'agents' in the present study. The principal's payment of manufacturing service charges gets distributed to the *JWU*s through the *agents*, who in turn retain a margin. This is called agents' margin in the rest of the study.

2.7 Most often, the *principal*, *agents* and *contractors* are expected to have the same economic activity or at least vertically related activities. When the material input is provided by a *principal* to a *contractor*, whether directly or through an *agent*, the former is assigned activity code for the entire production process, while the latter the code for the portion of the production process that it undertakes. The *principal* and the *contractor*, in most cases, are therefore likely to belong to the same industry – at least at the 2-digit level of National Industrial Classification (NIC). The hierarchical way of combining the NIC codes for determining the main activity code, in case of multiple activities (CSO, 2008[a]), makes it more likely that a *principal* and its manufacturing service providing *JWU* would have the same NIC division (2-digit code).

III. Identification of Units Receiving and Providing Manufacturing Services

3.1 This study is based exclusively on data available from secondary sources of two kinds, namely unit-level data of

a. Annual Survey of Industry (ASI) 2000-01 and 2010-11; and

b. Unorganised (non-factory) sector Enterprise Surveys (ESs) of the National Sample Survey Organisation (NSSO), 56th Round (2000-01), and 67th Round (2010-11);

3.2 The data on manufacturing sector are collected through ASI, covering the registered factories, and ESs covering the unregistered manufacturing units. Thus, for the entire manufacturing sector, estimates are obtained by pooling the estimates from the corresponding ASI and ES, ignoring the slight mismatch in the reference periods of the two surveys (End note 1).

3.3 The data on payment and receipts of manufacturing service charges and expenditure on main raw material (goods) and value of goods output are required for measuring outsourcing activities. Both in the ASI and ES, these are regularly collected, but cannot always be separated from other payments and receipts of service charges. Payment of exclusively manufacturing service charges are collected separately in the ASI. The item for recording receipts of manufacturing service charges, however, also includes charges for non-industrial services, such as business, computer-related and legal services. These are not expected to be of significant proportion in most cases. Thus, in general, the entire amount of receipts for services is assumed to be manufacturing services. The validity of the assumption is, however, examined while taking closer look at a few selected groups of economic activities in Section VI.

3.4 In the ES, however, data on manufacturing service charges are not available separately. The data collected on receipts and payments are inclusive of all kinds of service charges. Thus, the estimates of manufacturing services obtained from the ES are based on assumptions, which are expected to be largely valid.

3.5 The measures of production and use of manufacturing services discussed here are based on analyses of the unit-level data of the ASIs and ESs mentioned above. Repairing services, though included in the manufacturing sector according to the NIC, is excluded ②

from the purview of the present study, since repairing services are by their very nature manufacturing services. The rest of the discussion in this paper therefore concerns only the non-repair manufacturing activities.

3.6 First, it is necessary to specify the basic characteristics of the *principals*, *MSP*s, *JWU*s and *agents* that follow from the definitions discussed in Section II. The *principals*, whether outsourcing the entire or part of the production process, must report positive intermediate consumption of main raw materials (goods) and material output. In addition, it should be paying manufacturing service charges for work done by other enterprises on materials supplied by the unit.

3.7 The *MSP*s are characterised by positive receipts of income for manufacturing services provided to others and nil material output and input. Typically, they should not be paying any manufacturing service charges. The *JWU*s should have the same features and, in addition, the receipts of service charges should be from other enterprises and not households.

3.8 Like the *MSP*s, the agents are characterised by positive receipts of income for manufacturing services provided to others and nil material output and input. In addition, they should also have positive payment of manufacturing service charges for work done by other enterprises on supplied materials. .

3.9 Since the payment and receipt of manufacturing services are strictly speaking not always separable from payment and receipt for other services, the criteria adopted for the present study are set under a few assumptions that are expected to hold good in most cases. Keeping in mind the basic definitions and the data collected in the surveys, the criteria adopted for the study are discussed below.

Identification of Principals

3.10 In the ASI dataset, the establishments reporting positive material (goods) output, positive material input, and positive payment of manufacturing service charges are identified as *principals* in this study. The *principal* units in the ASI coverage are thus identified by the following criteria:

- positive goods output, i.e. VGO > 0,
- positive intermediate consumption of main raw materials or goods, i.e. $IC_{goods} > 0$, and
- positive payment of manufacturing service charges or intermediate consumption of manufacturing services, i.e. $IC_{JW} > 0$

3.11 In the ES datasets, principals are identified using similar conditions. But, as service charges paid includes payment for all kinds of services, a more restrictive additional condition on intermediate consumption of manufacturing services (expenses on job work) is included for identification. In the ES dataset, the criteria adopted for identifying the *principals* are thus as follows:

- VGO > 0,
- $IC_{goods} > 0$,
- IC_{JW} > 50% of the expenses other than on raw materials. and
- nil receipts of manufacturing service charges, i.e. $GVO_{MS} = 0$.

3.12 In fact, the cut off 50% is arbitrarily set, in absence of any other auxiliary information about the kind of services actually purchased.

Identification of Manufacturing Services Producing Units (*MSP*s)

3.13 The criteria used by Vishnu Kumar *et. al.* (2007) for identification of *MSP* establishments from the data set of the ES'56 are also used for the present study in a slightly modified form. The establishments reporting no material (goods) output, no material input, positive receipts of service charges and no payment of service charges are taken as the establishments engaged solely in production of manufacturing services. In the ES dataset, the criteria adopted for identifying the *MSP*s are thus as follows:

- VGO = 0,
- $IC_{goods} = 0$,
- IC_{JW} =0, and
- $GVO_{MS} > 0$.

3.14 Clearly, the estimates based on these criteria would be conservative ones, as there would also be other units providing manufacturing services.

Identification of JWUs

3.15 Registered factories covered in the ASI are not expected to provide manufacturing services directly to the households. Thus, all units providing manufacturing services are assumed to be *JWU*s. In the ASI datasets, the *JWU*s are identified simply by

- VGO = 0,
- $IC_{goods} = 0$,
- $IC_{JW} = 0$,
- $GVO_{MS} > 0$

3.16 On the other hand, many of the *MSP*s covered in the ES directly serve the households. Identifying the *JWU*s consists of distinguishing the *MSP*s serving other businesses.

3.17 The criteria used for identification of *JWU*s in the ES dataset are as follows:

- VGO = 0,
- $IC_{goods} = 0$,
- $IC_{JW} = 0$,

- $GVO_{MS} > 0$
- having prior marketing agreement with other units
- other units provide raw material and
- the unit has no secondary activity.

3.18 The last three conditions are used for identifying the job work units from among those providing manufacturing services, either to households or businesses. The units receiving raw materials from other units, with whom it has prior marketing agreement, in most cases would be job work units. To ensure that they do not provide any services other than manufacturing services, the condition of 'no secondary activity' is included.

Identification of Agents

3.19 Agents have the distinguishing feature of both provider and recipient of manufacturing services. Thus, for both ASI and ES datasets, the criteria used for identification of *JWU*s are as follows:

- $VGO = 0$,
- $IC_{goods} = 0$,
- $IC_{JW} > 0$,
- $GVO_{MS} > 0$.

IV. Contribution of Outsourcing Activities in Domestic Product

4.1 The estimates presented in *Table 2* relate to units engaged either in production of manufacturing services or providing *job work* to other units.[7] These are obtained using the criteria of identifying the units playing different roles in outsourcing activities set out in the preceding section. According to these criteria, only those exclusively engaged in production of manufacturing services are identified as *MSP*s. Evidently, there would be establishments providing manufacturing services as well as producing goods output on their own accord. In absence of a separate code for manufacturing services and provision for separately recording receipts from manufacturing services in the ASI and ES schedules of enquiry, these could not be identified. Thus, the estimates of *MSP*s and their workers presented in *Table 2* should be regarded only as lower limits.

4.2 In spite of this, *Table 2* reveals that about a half of the non-repairing manufacturing establishments have been solely engaged in production of manufacturing services during the first decade of the millennium. During this period, their share in non-repairing manufacturing sector employment has remained just over one-third. Characteristically, the *MSP*s are small and are run without hired workers. Thus, they are more common in the

[7] The estimates of GVA, in nominal terms, shown in the table are survey estimates and are different from those presented in the National Accounts Statistics (NAS) published by the CSO. In the NAS, while the estimates for the registered segment are based on the ASI results, those for the unregistered segment are derived using results of the ES 2005-06 of the NSSO and the Fourth All India Census on Micro, Small and Medium enterprises, 2006-07 released by the Office of the Development Commissioner. (CSO 2012[a])

unorganised (unregistered) segment of the manufacturing sector and have a share of over a third in the GVA of unorganised manufacturing. It is seen that *MSP*s are also found among the registered establishments, though in a much smaller proportion. By assumption, all these carry out job work, i.e. work for other businesses and do not directly serve the households.

4.3 The organised and unorganised segments taken together, the *JWU*s constitute over a third of the *MSP*s and have a share of over a half in the GVA of the *MSP*s in 2010-11. The table reveals that there were about 26%, i.e. about 9.5 million, workers engaged in job work in unorganised non-repairing manufacturing in 2000-01. Most of them, being own-account workers, ought to be considered as 'home workers' as defined by the ILO. Based on the Employment and Unemployment Survey, NSSO 55th round (1999-2000), the National Commission for Enterprises in the Unorganised Sector NCEUS (2007) arrived at an estimate of 7 million home workers for 1999-2000. This evidently conforms well with the estimate of workers engaged in job work obtained in the present study, given that some job work is also carried out in unorganised manufacturing enterprises run by employers.

4.4 The *principals*, who provide the *JWU*s with job work assignments, are naturally more common among the registered units. More than a fourth of the registered units are found to outsource production process. In the entire non-repairing manufacturing, the *principals* have a close to 50 per cent share of the GVA. The *agents*, through whom the *principals* distribute the job work to the *JWU*s, too have a significant presence. About 5 per cent of the manufacturing workforce is engaged in intermediation of job work distribution.

4.5 An observation of significance that can be readily made from the table is that while there was little change in the share of *MSP*s in the number of non-repairing manufacturing units and their workforce, there was a drastic fall in their share in the GVA – from about 12% in 2000-01 to just 4.5 % in 2010-11. But, at the same time, the share of the *principals* in the non-repairing manufacturing GVA moved up from 34% in 2000-01 to 46% in 2010-11, with their share in the workforce showing a small upward change. These are issues that deserve further investigation. What is relevant for the present study is that the increasing share of *principals* in the non-repairing manufacturing GVA reflects growing dependence of the entire manufacturing sector on outsourcing of manufacturing process.

V. Outsourcing in Different Industries

5.1 Outsourcing of manufacturing processes is more common in certain specific industries. In addition, there are activities in which large amount of manufacturing services are produced for direct consumption of the households. The specific non-repairing manufacturing activities in which the activity of outsourcing is carried out predominantly can be identified from the pooled data of ASI and ES. *Table 3* presents the estimates of service charges paid and received as percentage of the value of goods output (*VGO*) for the economic activities (at 5-digit level of NIC) with high participation (either as *principals* or *JWU*s) in outsourcing activities as well as providing manufacturing services directly to the households in 2010-11.

5.2 For working out the ratios given in the table, the service charges paid by the *principal* unregistered units and all 'payments for work done by other units on materials supplied' by the outsourcing registered units is taken as payment for manufacturing services. On the receipts side, service charges received by all registered units and those received only by the unregistered *MSP*s are considered for computing the ratios. All the ratios are presented as percentages of the value of goods output of the respective segments. The payment-related ratio is an indicator of relative level of outsourcing involved in carrying out an economic activity.

5.3 Of the activities listed in the table, the activities, such as custom tailoring, and flour milling (*aata chakkis*), are carried out mainly for direct final consumption of the households. Among the rest, the *MSP* units pursuing activities like manufacture of all types of textile garments and clothing accessories, weaving, manufacture of cotton and cotton mixture fabrics, manufacturing match boxes and diamond cutting and polishing and other gem cutting and polishing are mostly carried out as job work for other businesses. For many of these activities, however, the *MSP*s serve both the households and businesses. For instance, the activities of embroidery and *zari* work, knitted and crocheted cotton & woollen fabrics, jewellery making, making wooden furniture, are carried out both as job work for other manufacturing units as well as for direct consumption of the households.

5.4 Typically, registered *principals* outsource manufacturing processes to the *JWU*s, who are mostly unregistered. Thus, the ratio of manufacturing service charges received to *VGO* is mostly much higher for unregistered units in the industries where outsourcing is common. For instance, the unregistered units engaged in '*bidi* making', being mostly *JWU*s, do not have much physical output but large receipts for manufacturing services they provide. The *Bidi* making factories account for most of the physical output and thus the payment-related ratios are relatively high for registered units. The higher payment-related ratio for the unregistered units, in this case, owes to substantial presence of agents, who are mostly unregistered. There are, however, registered units carrying out job work.

5.5 Evidently, most of the receipts and payments for most of the job work are expected to be transacted within the industry (5-digit level NIC) or within the vertically-related manufacturing activities. There are, however, a few activities like manufacturing of wooden agricultural implements, hand tools for agricultural/horticulture and structural wooden goods, for which job work are carried out for capital formation in non-manufacturing industries.

VI. Reporting Bias in Manufacturing Services Data

6.1 *Table 3* reveals that the ratio of manufacturing service charges receipts to *VGO*, pooled over registered and unregistered non-repairing manufacturing, is higher than that of the payment to *VGO* ratio for most of the industries (5-digit level NIC). This raises the issue of incomplete coverage of *principals* in the ASI and ES. It is evident from the way they are worked out, the payment-related ratio is not expected to be seriously affected by non-inclusion of manufacturing service charge payments. The receipt-related ratio, on the other hand, is expected to be affected by the

approximations made in determining manufacturing service charge receipts. The receipts of manufacturing service charges for the unregistered segment include those of only the units engaged solely in production of manufacturing services and, thus, are likely to be on the lower side. On the other hand, the receipts considered for the registered segment include receipts for non-industrial services like financial, legal and business consultancy services as well. However, since the establishments registered as factories are rarely involved in providing such non-industrial services, the measure used for receipts of manufacturing service charges in the study, if at all affected by over inclusion, is not expected to be much on the higher side.

6.2 Notwithstanding the approximations, the estimates of receipts for manufacturing services (GVO_{MS}) ought to be close to the sum of estimates of their uses, namely intermediate consumption within ($IC_{JW\text{-}WI}$) and outside ($IC_{JW\text{-}OI}$) the industry and their final use (FU_{MS}). The last term includes final consumption, capital formation and net exports. As both the ratios have *VGO* as the base, the difference between the two owes to difference between GVO_{MS} and $IC_{JW\text{-}WI}$.

6.3 As expected, the difference between the two estimates for industries like custom tailoring (NIC 14105)[8], flour milling (NIC 10611), *zari* work (NIC 13992) and jewellery making (NIC 32111) is very high, since the manufacturing services produced in these industries are mostly consumed by the households. For manufacture of builders' carpentry (NIC 16229) & structural wooden goods (NIC 16221) and agricultural implements (16293), the manufacturing services are mainly used respectively by construction industry and farmers for capital formation and thus have a large difference between the two ratios. Further, the difference noted for diamond cutting industry (NIC 32112) can be explained by presence of unregistered units in significant number who carry out job work for overseas firms.

6.4 These apart, for most of the industries with high prevalence of *MSP*s, the difference is inexplicably high. Needless to say, the manufacturing services are not likely be transacted only between units belonging to narrowly-defined (5-digit level NIC codes) non-repairing manufacturing industries. The narrowly-defined industries can, however, be clubbed to form broader groups of industries that transact manufacturing services only within themselves. For example, the industry group "Manufacture of glass bangles" (NIC 23106) has a manufacturing services receipt to VGO ratio as high as 32.4% while the manufacturing services payment by the units of this industry is found to be nil. According to the ES'67 results, there is a large number of *MSP*s engaged in making glass bangles. But, no *principal* with this NIC code is captured in the sample of ASI 2010-11 or ES'67. The *principals* contracting job work may quite likely be engaged in other vertically-related industries. It should be possible to define a "closed" group of 5-digit level NIC codes for manufacturing activities that includes glass bangles making and within which all the payments and receipts for job work are made. Henceforth, such sets of 5-digit level NIC codes are called 'closed groups'.

[8]By definition 'custom tailoring' includes only the activities of making and altering dresses according to individual specifications or needs. Custom tailoring units are therefore expected to be small unregistered units serving only the households. The ASI data show presence of a few factories carrying out custom tailoring, some of which get job work done by others. The ES data also indicate presence of *principal* and *agent* unregistered units in custom tailoring. These as it appears should be assigned the NIC code '14101' for garments making and not that for custom tailoring.

6.5 Even for 'closed groups', the difference between the two ratios are found to be too high to explain. *Table 4* shows the order of difference between the estimated receipts and payments for job work for a few selected identifiable 'closed groups'. The 'closed groups' presented here are, however, for illustration and are not claimed to be perfectly closed.

6.6 The estimates of payments presented in col.(5) of the table, besides the payments made by the *principals*, include those paid by the *agents* net of their receipts. Thus, the negative payment figure for the group 'Jewellery and precious stone work' indicates that presence of agents who receive contracts from overseas firms and get job work done by local *JWU*s. In case of 'carpets and floor coverings', the entire receipts for manufacturing services may actually be for job work. Some of the job work receipts might have been unduly excluded owing to the criteria adopted for identifying *JWU*s. Thus, the receipts and payments, in this case, appears to be fairly well balanced.

6.7 For the rest of the groups, receipts for job work by far exceed the payments. The reasons for the observed differences can be attributed to the following:

(i) Misclassification: The 'factory-less manufacturers', as the *principals* who do not undertake any manufacturing activity on their own accord are often called, may be erroneously assigned codes for trading activity.

(ii) Under-coverage of *principals*: The factory-less manufacturers may altogether have been missed in the surveys of unregistered manufacturing. For instance, the producers of branded shirts or shoes, may only have office establishments that manages the supply-chains, job work allocations and distribution of the final products to retail outlets. These, by definition, should be recognised as *principals*, but in all likelihood are prone to under-enumeration during field work of the surveys.

(iii) Under-reporting of outsourcing activities: This may be caused by the tendency of under-reporting of outsourcing activities by the *principals* to evade legal provisions. Evidently, the estimates on outsourcing in case of *bidi* making are seriously affected by such under-reporting. This may also be caused by *principals* misreporting service charges paid as labour cost.

VII. Treatment of Manufacturing Services in SUTs and IOTTs

7.1 In the framework of the System of National Accounts (SNA), Supply-Use Tables (SUTs) is the first set of global tables from which the rest of the national accounts statistics, including Input-Output Transaction Tables (IOTTs), is recommended to be derived. This captures all transactions in goods and services and helps in verification and reconciliation of the estimates as well as estimating the missing values. The SUTs are founded on commodity balance identity involving estimates of production and imports on the supply-side and those of intermediate and final consumption, investment in fixed capital and inventories, and exports on the uses-side. This identity, in fact, holds good for each individual goods and services. In its general form, the commodity balance identity is as follows:

$$GVO_{mp} + M = \text{supply} \equiv \text{use} = IC + PFCE + GFCE + GFCF + CII + \textit{acquisition less disposal of valuables} + X$$

where

GVO_{mp}	Gross value of output at market prices
IC	Intermediate Consumption
GFCF	Gross Fixed Capital Formation
CII	Change in Inventories
GCF	Gross Capital Formation (= *GFCF* + *CII*)
GFCE	Government Final Consumption Expenditure
PFCE	Private Final Consumption Expenditure
M	Imports (valued at *fob* without import duties)
X	Exports

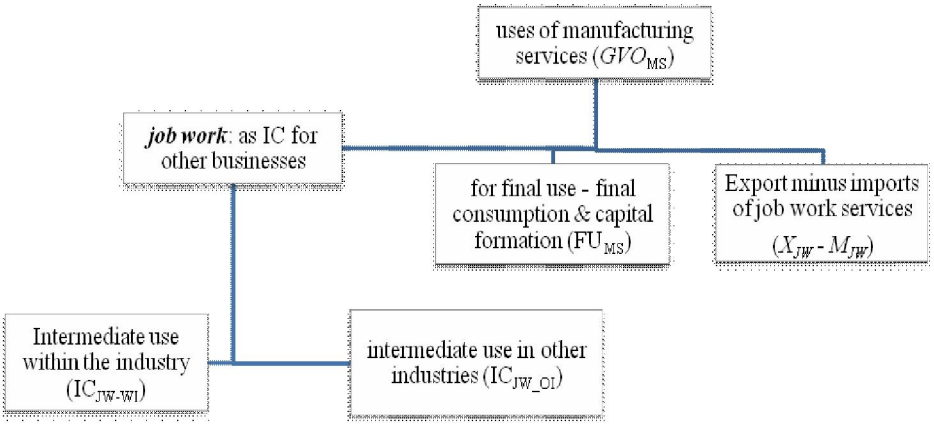
7.2 There could be as many commodity balance identities as the number of distinct products (goods and services) or product categories used in national accounts compilation. In most cases, the manufacturing services are not used for acquisition of valuables. Thus, ignoring the 'valuables', the commodity balance identity reduces to

$$GVO_{mp} \equiv IC + PFCE + GFCE + GCF + (X - M)$$

7.3 For the discussion on manufacturing services in what follows, it is necessary to distinguish between production of 'goods' and 'services', particularly from the standpoint of the various uses of 'manufacturing services'. Primarily, the gross value of output at *basic price* (GVO_{bp}) can be divided into output of manufacturing services (GVO_{MS}) and output of goods and other services (henceforth the symbol *VGO* is used to denote goods output plus output of services other than manufacturing services at basic prices), both the components valued at basic prices. Symbolically,

$$GVO_{bp} = VGO + GVO_{MS}$$

7.4 Manufacturing services are used both by the households (mainly for final consumption) and businesses (mainly for further production). Thus, for a particular industry (a 5-digited NIC code or a group of such codes), assuming exports and imports of manufacturing services for direct use of households to be negligible, the uses of GVO_{MS} can be classified as follows:



7.5 For ease of expression, henceforth (X_{JW} - M_{JW}) is combined with final use of manufacturing services and denoted as FU_{MS}. Thus, for a particular industry (a 5-digited NIC code or a group of such codes), the identity for the manufacturing services takes the following form:

$$GVO_{MS} \equiv IC_{JW\text{-}WI} + IC_{JW\text{-}OI} + FU_{MS}$$

ignoring direct final use of manufacturing services produced abroad by the residents and that produced in the domestic economy by non-residents.

7.6 The ASI and ESs provide estimates of gross value of output at basic prices. At market prices, gross value of output is written as follows:

$$GVO_{mp} = VGO + GVO_{MS} + \text{product taxes} - \text{product subsidies.}$$

7.7 The datasets of ASI 2010-11 and ES'67 reveal that the *MSP*s and agents do not pay any product tax (i.e. excise duty, VAT, sales tax etc.) or receive any subsidy. The difference between GVO_{bp} and GVO_{mp} thus owes entirely to product taxes (*minus* subsidies) charged on the *VGO*. In view of this, the gross value of output at market prices can be written as

$$GVO_{mp} = (1+T).VGO + GVO_{MS}$$

or $$GVO_{mp} = (1+T).(VGO_{WI} + VGO_{OI}) + GVO_{MS}$$

where T is the average rate of (product taxes *minus* product subsidies) and sub-scripts 'WI' and 'OI' denotes within industry and outside industry respectively.

7.8 Now, denoting goods output for final use by $FU_{GO,}$ the supply use identity for the goods output is

$$(1 + T).\,VGO \equiv (1 + T).\,VGO_{WI} + (1 + T).\,VGO_{OI} + (1 + T).\,FU_{GO}$$

and the sectoral output at market prices can be written as

$$(1+T).VGO - (1+T).VGO_{WI} + GVO_{MS} - IC_{JW\text{-}WI}$$

which should be same as outside -industry use

$$(1 + T).\,VGO_{OI} + (1 + T).\,FU_{GO} + IC_{JW\text{-}OI} + FU_{MS}$$

7.9 This is the amount available for intermediate consumption and final use in other industries and households. What needs to be taken special note of is that the sectoral output excludes within-industry intermediate consumption of manufacturing services.

Treatment of Manufacturing Services in IOTTs

7.10 Treatment of manufacturing services in compilation of Input-Output Transaction Tables involves issues relating to balancing the supply and uses sides discussed above. Derivation of the Commodity x Commodity Input-Output (CxC I-O) Table involves separating the output and inputs associated to the by-products and joint products from those of the main product of an I-O sector and transferring them to the I-O sector to which they characteristically belong. Vishnu Kumar *et. al.* (2007) points towards a possibility of

introducing severe inconsistencies in IOTTs, if the standard methods of separating data on output and associated inputs of main and secondary products (UN 1999) are not applied appropriately.

7.11 For compilation of IOTTs in India, manufacturing services are treated as secondary product of all individual I-O sectors of manufacturing industries and are clubbed with different kinds of services in an I-O sector called 'other services'. While deriving the Commodity x Commodity (CxC I-O) matrices of IOTTs for 1993-94 and 1998-99 (CSO 2000, CSO 2005), all payments and receipts of commission and service charges for job work are treated respectively as input and output of I-O sector '114', i.e. 'other services'. In these IOTTs, the I-O sector '114', as a group of industries, is constituted of real estate, religious, legal, recreation and entertainment, domestic laundry, cleaning and dying, barbers and beauty shops and other personal services, sanitary services etc., wrapping packing and filling of articles and information & broadcasting services. Separating output and associated input of manufacturing services from manufacturing and transferring them to "other services" is based on the "industry technology" assumption (inputs are consumed in the same proportions by every product produced by a given industry), while manufacturing services are produced without the main raw materials input. Vishnu Kumar *et. al.* (2007) observe that the input structure of the *MSP* units is characteristically different from that of the entire manufacturing sector.

7.12 The IOTTs compiled for 2003-04 (CSO 2008) and 2007-08 (CSO 2012) exhibit considerable improvement over the earlier IOTTs. For instance, the unduly high ratio of PFCE to GVA for 'other services' in IOTT 1993-94 has come down to a reasonable level in IOTT 2007-08 (*Table 5*). The number of I-O sectors has increased to 130 sectors, as against 115 in 1998-99 IOTT. The I-O sector "Other Services" (Sector114) of the IOTTs of 1993-94 and 1998-99 are now disaggregated into seven separate I-O sectors[9]. The one designated as sector 129 is called 'other services' in the last two IOTTs and includes only (a) sanitary services, (b) recreation & entertainment, (c) radio & TV broadcasting services (d) international and other territorial bodies and (e) services not elsewhere classified.

7.13 Besides the disaggregartion of the 'other services' I-O sector, the treatment of manufacturing services seems to have undergone significant modification in the latter IOTTs. In the description of use of data available from the ASI for IOTT compilation, CSO (CSO 2008) states that the value of 'work done by others on materials supplied ...' and that of 'income from services' are allocated to 'other services' sector in the input and output flows respectively. Thus, manufacturing services are all treated as 'services not elsewhere classified'. This again poses the problem of determining the input structure of the sector, which also includes a wide variety of services other than manufacturing services.

7.14 That the values of manufacturing services (as a part of 'work done by others on materials supplied ..' and that of 'income from services') are allocated to 'other services', however, is not reflected in the Make Matrix I-O table of 2007-08. In IOTT 2007-08, most of

[9] The "other services" sector of IOTT 1998-99 has now been separated into the following seven sectors: "Business Services" (Sector 123), "Computer related Services" (Sector 124), "Legal Services" (Sector 125), "Real Estate Services" (Sector 126), "Renting of Machinery & Equipment" (Sector 127), "Other Community, Social & Personal Service (Sector 128) and "Other services" (Sector 129).

the figures in the column for I-O sector 129 for Manufacturing I-O sectors are rather low, as compared to those of IOTT 1993-94. In fact, in IOTT 2007-08, these are too low to represent the manufacturing services produced as by-product of the manufacturing I-O sectors. For instance, for the sector 'tobacco products', which includes 'manufacture of *bidi*' that has a very high manufacturing services to *VGO* ratio, there is no value in the column for I-O sector 'other services' in the Make Matrix of 2007-08. The Make Matrix I-O table of 1993-94, on the other hand, show significant positive value in the corresponding entry. The figures presented in *Table 5* illustrates that the treatment of manufacturing services has been modified significantly in the latter IOTTs..

7.15 The ratios derived from CxC I-O Table 2007-08, presented in *Table 5*, are based on two different definitions of 'other services'. The "new' definition refers to the one adopted for IOTT 2007-08 and the "old" refers to that adopted for IOTT 1993-94, which consists of seven I-O sectors of IOTT 2007-08. Evidently, ratios worked with 'old' definition for IOTT 2007-08 are comparable to those of IOTT 1993-94. All the ratios presented in the table have GVA of 'other services' as the base, since, unlike GVO, GVA of a group of economic activities is invariant to splitting into or merging of its sub-groups.

7.16 What is most striking about the comparable ratios in cols. (3) & (4) of *Table 5* is that the value of 'other services' produced by the Manufacturing I-O sectors differ significantly between the two IOTTs. While the comparable ratios for the intermediate consumption of 'other services' in Manufacturing I-O sectors are by and large of similar order in the two IOTTs, that for GVO of 'other services' in Manufacturing I-O sectors in IOTT 2007-08 (as per "old" definition) is by far lower than that of IOTT 1993-94. This and the observation made from the Make Matrices suggest that the GVO_{MS} produced in individual manufacturing I-O sectors is not appropriately included in its intermediate consumption.

VIII. Is Private Final Consumption Expenditure (PFCE) overestimated?

8.1 The CSO's follows the "commodity flow" approach for deriving estimate of *private final consumption expenditure*. This approach consists of obtaining the quantum and value of different commodities flowing finally into the consumption process of the households and the private non-profit institutions serving households (NPISHs), from the quantum and value of the commodities produced and available during the accounting year. Generally speaking, in this approach, the following are netted out from the quantum and value of the total output of a commodity or a commodity-group to arrive at the estimate of its *net availability* in the domestic economy:

(i) The part used up in the process of further production (*intermediate consumption*),

(ii) Change in stocks and

(iii) Exports net of imports.

An amount is also discounted for the wastage of agricultural produce.

8.2 Having thus arrived at the estimate of *net availability*, the part used for capital formation and that used by the general government administration for current consumption are deducted from it to arrive at the commodity-wise estimates of the quantum and value of *private final consumption expenditure* (PFCE) at current market prices.

8.3 Thus, by commodity-flow approach, the private consumption expenditure of a commodity ought to be derived as

$$PFCE = \{(1+T).VGO - (1+T).VGO_{WI} + GVO_{MS} - IC_{JW\text{-}WI}\} - (\text{intermediate use of goods \& services in other industries}) - GCF - (X - M)$$

8.4 Clearly, if the within-industry intermediate consumption of manufacturing services, $IC_{JW\text{-}WI}$, is not deducted from the value of output – of both goods and services - of the associated industry, there is a possibility of overestimating *PFCE*. While working out the net availability of a commodity, CSO considers only its physical output. But, the procedure followed for estimating gross value of output for unregistered manufacturing [CSO 2012[a]] does not seem to have provision of distinguishing output of goods and manufacturing services. Thus, in absence of proper accounting of associated manufacturing services, there remains the possibility of arriving at an inflated figure of PFCE.

8.5 The possible impact of improper reckoning of within-industry intermediate use of manufacturing services while working out sectoral output on PFCE estimates is examined in *Table 6*, for a few selected 'closed groups'. For each of the 'closed groups', col. (2) is derived from the pooled data of ASI 2010-11 and ES'67. The within-industry intermediate consumption to GVO and PFCE to GVO ratios, given in cols. (3) & (4), are worked out from the CxC I-O Table 2007-08. Likely over-estimation of PFCE, given in col.(5), is worked out as the ratio of col.(2) to col.(4) – expressed in percentages – under the assumption that the within-industry intermediate consumption of manufacturing services ($IC_{JW\text{-}WI}$) has been unduly included in the net availability owing to its improper treatment of manufacturing services in compilation of IOTT. The last column provides the percentage differences between the discrepant estimates of private final consumption – those obtained from Household Consumption Expenditure Survey of NSSO set against those from NAS - for the year 2004-05 (CSO 2008[b]). The figures in col.(5) indicate how much of the percentage difference between NSSO and NAS estimates of private final consumption given in col.(6) may possibly owe to inappropriate treatment of manufacturing services in compilation of NAS. Needless to say, the ratios in cols. (2), (3) & (4) are assumed to change little in the short run.

8.6 The ratios in cols.(2) & (3) for tobacco products and carpets & other floor covering clearly indicates that the IC_{WI} does not include $IC_{JW\text{-}WI}$. Thus, if in the process of compilation the manufacturing services produced in these industries are included in the GVO, the PFCE estimates would certainly be overestimated. This warrants a critical review of the IOTT compilation procedure for manufactured products, which, in turn, is expected to reduce the difference between the two sets of estimates.

IX. Concluding Remarks

9.1 The practice of outsourcing manufacturing processes in India is undergoing rapid change. In fact, the results of recent surveys on manufacturing industries reflect a sharp decline in the share of *JWU*s in the workforce and GVA of manufacturing sector during the first decade of the present millennium. At same time, the increasing share of *principals* in the non-repairing manufacturing GVA reflects growing dependence of the entire manufacturing sector on outsourcing of manufacturing processes.

9.2 The Committee on Unorganised Sector Statistics, in its report (National Statistical Commission, 2012), emphasised the need for data to understand and gauge the links between the formal and informal sector. The Committee noted that the phenomenon of outsourcing by manufacturing firms for industrial products to smaller firms constitute the links between the registered and unregistered manufacturing sector and recommended compilation IOTTs for the latter. Compiling IOTTs for the unregistered units from the available data sets would require assumptions of the kind made in the present study.

9.3 One way of representing the manufacturing services in the Input-Output Transaction Tables could be to treat the manufacturing services exclusively as a separate I-O sector. While compiling the IOTTs with manufacturing services as a product, produced as a bye-product in the manufacturing I-O sectors, the receipts for manufacturing services of k^{th} industry, $GVO_{MS}(k)$, ought to be included in the column for manufacturing services in the Make Matrix and $IC_{JW\text{-}WI}(k)$ as intermediate consumption of manufacturing services in the Absorption Matrix.

9.4 This warrants greater attention towards collection of data relating to outsourcing and adequate care in using the data for compilation of national accounts. Evidently, there are establishments providing manufacturing services as well as producing goods output on their own accord. In absence of a separate provision for recording manufacturing services and provision for recording receipts from manufacturing services in the ASI and ES schedules of enquiry, these are at present not clearly identifiable. Thus, for clearer understanding of outsourcing activities in manufacturing sector, it is necessary to collect data separately for the manufacturing services.

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***Table 1*: Indicators Relating to Outsourcing in Non-repairing Manufacturing Sector - Changes during last decade**

Indicators	2000-01			2010-11		
	registered	un-registered	all	registered	un-registered	all
1. Percentage share of *MSP*s in workforce	4.6	42.0	**35.5**	3.8	44.0	**33.8**
2. Percentage share of *JWU*s in workforce	4.6	26.0	**22.3**	3.8	17.3	**13.9**
3. Percentage share of *MSP*s in GVA	1.8	37.2	**11.8**	2.0	33.0	**4.5**
4. Percentage share of *JWU*s in GVA	1.8	23.8	**8.0**	2.0	9.7	**2.6**
5. Material input to VGO ratio	0.75	0.70	**0.74**	0.81	0.73	**0.80**
6. Percentage share of imports in raw material input	27.3	neg.	**22.0**	42.4	neg.	**38.7**
7. Service charges receipts to VGO ratio (%)	5.3	30.3	**9.5**	4.1	39.1	**6.6**
8. Service charges payments to VGO ratio (%)	2.3	3.8	**2.6**	1.7	2.4	**1.8**

***Table 2*: Percentage Shares of Outsourcing-related Units in Employment and Gross Value Added of Non-repairing Manufacturing - Changes during last decade**

	Parameter	2000-01			2010-11		
		registered	un-registered	all	registered	un-registered	all
All non-repairing Manufacturing Establishments							
1	Number of establishments (000)	161	17012	17173	190	16786	16976
2	Number of workers (000)	7722	37050	44772	11510	33871	45381
3	Gross Value Added (Rs. 000 Crores)	154	60	214	1554	140	1693
Non-repairing Manufacturing Service Producing (MSP) units							
4	Number of establishments (%)	6.2	48.6	48.2	6.3	53.2	52.6
5	Number of workers (%)	4.6	42.0	35.5	3.8	44.0	33.8
6	Gross Value Added (%)	1.8	37.2	11.8	2.0	33.0	4.5
Non-repairing Manufacturing Service Producing job-work units (JWU)							
7	Number of establishments (%)	6.2	26.6	26.4	6.3	19.5	19.3
8	Number of workers (%)	4.6	26.0	22.3	3.8	17.3	13.9
9	Gross Value Added (%)	1.8	23.8	8.0	2.0	9.7	2.6
Non-repairing Manufacturing establishments providing job-work assignments- Principals							
10	Number of establishments (%)	24.8	3.3	3.5	28.9	0.9	1.0
11	Number of workers (%)	45.8	4.1	11.3	51.2	1.4	14.0
12	Gross Value Added (%)	44.8	5.5	33.8	50.1	2.1	46.2
Agent units for job-work assignments							
13	Number of establishments (%)	1.9	5.8	5.7	2.1	3.8	3.8
14	Number of workers (%)	1.4	6.9	6.0	2.3	5.8	4.9
15	Gross Value Added (%)	1.1	9.0	3.3	1.2	8.7	1.8

***Table 3*: Service Charges to Goods Output Ratios for Non-repairing Manufacturing Industries with High Prevalence of *MSP*s in 2010-11**

Sl. No.	NIC 2008 code	Industry description (Manufacturing)	Ratio of receipts and payments for manufacturing services to goods output (%)					
			Payment			Receipts		
			Registered	Unregistered	Entire sector	Registered	Unregistered	Entire sector
(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)
1	14105	Custom tailoring	2.5	1.6	**1.7**	35.1	1096.4	**1027.0**
2	12002	Manufacture of *bidi*	20.0	31.1	**21.3**	3.9	457.4	**58.3**
3	10611	Flour milling	0.2	0.0	**0.2**	1.4	241.6	**23.9**
4	14101	All types of textile garments and clothing accessories	14.2	2.5	**13.6**	11.1	40.4	**12.6**
5	13991	Embroidery work and making of laces and fringes	13.3	3.4	**12.7**	59.6	3544.4	**290.4**
6	13992	Zari work and other ornamental trimmings	1.5	0.0	**0.7**	5.4	1234.0	**664.1**
7	31001	Furniture made of wood	4.9	0.1	**0.9**	5.6	19.0	**16.7**
8	13121	Weaving, manuf. of cotton and cotton mixture fabrics.	3.9	8.4	**4.6**	4.6	71.2	**14.4**
9	13111	Preparation and spinning of cotton fibre	1.5	0.0	**1.5**	3.2	7.8	**3.3**
10	16221	Manufacture of structural wooden goods	2.3	0.1	**0.5**	7.8	74.0	**62.7**
11	10612	Rice milling	0.3	0.5	**0.3**	4.1	19.6	**5.8**
12	32111	Jewellery of gold, silver & other precious metal	0.7	0.2	**0.6**	1.6	14.0	**5.1**
13	23921	Manufacture of bricks	0.1	0.5	**0.4**	1.2	0.2	**0.4**
14	23931	Articles of porcelain or china, earthenware, imitation	0.0	0.1	**0.1**	0.6	0.7	**0.6**
15	21002	Allopathic pharmaceutical preparations	0.9	0.0	**0.9**	4.9	0.0	**4.9**
16	32120	Imitation jewellery and related articles	0.7	1.8	**1.6**	5.3	60.6	**51.4**
17	15201	Leather footwear	5.7	1.8	**5.3**	6.8	8.7	**7.0**
18	10793	Processing of edible nuts	4.4	0.2	**3.7**	9.2	10.1	**9.4**
19	25111	Doors, windows and their frames, shutters and rolling	17.9	0.1	**3.6**	130.0	8.8	**33.0**
20	14301	Knitted or crocheted wearing apparel etc.	19.1	0.0	**19.1**	9.8	37.1	**9.8**
21	13134	Finishing of man-made and blended textiles.	6.5	23.9	**14.8**	77.9	2.1	**41.8**
22	13119	Preparation & spinning of jute, and other natural fibres	0.4	0.5	**0.4**	0.6	134.0	**1.5**
23	20238	Manufacture of *agarbatti* and other preparations	1.4	2.3	**1.6**	1.8	49.8	**13.7**
24	13122	Weaving, manufacture of silk and silk mixture fabrics	1.9	9.2	**5.1**	2.6	25.6	**12.7**
25	25932	Manufacture of hand tools for agricultural/horticulture	6.6	0.0	**4.1**	2.5	51.3	**20.9**
26	13131	Finishing of cotton and blended cotton textiles.	5.9	0.0	**5.8**	48.0	145.8	**49.3**
27	25920	Machining; treatment and coating of metals	4.9	0.0	**4.5**	35.4	358.2	**64.4**
28	13114	Preparation and spinning of man-made fiber	0.7	0.0	**0.7**	2.1	2.0	**2.1**
29	32112	Working of diamonds & other precious stones	4.9	0.0	**4.9**	5.5	4492.6	**10.7**
30	21001	Medicinal substances used for pharmaceuticals	0.9	0.0	**0.9**	5.6	3.5	**5.6**
31	18112	Printing of magazines and other periodicals, books etc.	5.4	2.2	**4.5**	25.1	3.7	**18.6**
32	13124	Weaving, manufacturing of man-made fiber etc.	7.0	0.2	**3.2**	6.3	2.4	**4.1**

***Table 3*: Service Charges to Goods Output Ratios for Non-repairing Manufacturing Industries with High Prevalence of *MSP*s in 2010-11**

Sl. No.	NIC 2008 code	Industry description (Manufacturing)	Ratio of receipts and payments for manufacturing services to goods output (%)					
			Payment			Receipts		
			Registered	Unregistered	Entire sector	Registered	Unregistered	Entire sector
(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)
33	14309	Other knitted and crocheted apparel including hosiery	5.9	3.7	**5.8**	4.1	68.6	**6.1**
34	16293	Wooden agricultural implements	0.0	0.1	**0.1**	0.0	369.9	**369.9**
35	25994	Metal household articles	1.6	1.4	**1.5**	1.3	106.4	**33.8**
36	29302	Parts and accessories of bodies for motor vehicles	1.6	0.0	**1.5**	1.4	33.7	**1.6**
37	13932	Carpets and other floor coverings made of wool	39.1	31.1	**38.3**	3.2	245.5	**26.4**
38	14109	Wearing apparel n.e.c.	13.9	2.8	**11.7**	4.7	57.7	**15.3**
39	20291	Manufacture of matches	2.5	0.1	**2.2**	7.5	25.3	**9.9**
40	13911	Knitted and crocheted cotton fabrics	12.1	0.0	**11.7**	17.0	49.7	**18.0**
41	16229	Builders carpentry and joinery n.e.c.	15.7	0.0	**11.2**	50.5	617.5	**211.2**
42	13139	Other activities relating to finishing of textile n.e.c.	13.0	0.0	**12.9**	47.8	1007.5	**59.9**
43	15122	Purse, ladies' handbags, artistic article made of leather	7.4	1.3	**7.0**	6.7	70.2	**11.3**
44	13931	Carpets and other floor coverings made of cotton	15.8	10.3	**15.4**	2.7	205.7	**18.9**
45	32901	Stationery articles such as pens and pencils of all kinds	3.5	6.0	**3.6**	4.3	372.8	**20.7**
46	23106	Manufacture of glass bangles	0.0	0.0	**0.0**	1.8	83.1	**32.4**
47	14104	Wearing apparel made of leather and substitutes	14.3	0.0	**14.3**	6.1	1575.0	**7.9**
48	12003	Manufacture of cigarettes, cigarette tobacco	0.3	0.0	**0.3**	1.4	4358.4	**1.4**
49	13912	Manufacture of knitted and crocheted woollen fabrics	11.4	0.0	**7.9**	0.8	212.6	**65.6**
50	13133	Finishing of wool and blended wool textiles.	1.9	0.0	**1.9**	24.7	2148.6	**26.5**

***Table 4*: Receipts and Payments for manufacturing services in Selected 'Closed Groups'**

(Rs. Crore)

Constituent 5-digit NIC codes	**Broad description of the 'closed group'**	**Receipts for**		**Payments for job work**
		Manufacturing services	Job work	
(1)	(2)	(3)	(4)	(5)
12001 to 12006, 12008 & 12009	Tobacco products	4137	3214	1471
13931 to 13935 & 13939	Carpets and other floor coverings	853	638	877
14101 to 14105, 14109 & NIC Div. 13	Textile and wearing apparel	36014	27414	4354
15111 to 15116, 15119, 15122, 15123, 15129 & 15201	Leather product	2157	1967	955
28110, 28132, 28162, 29199, 28221, 28223 & 28229	Machines, engines etc. and their parts	13478	13300	2298
32111 to 32113, 32119 & 32120	Jewellery and precious stone work	6310	2957	-1016

***Table 5*: Ratios of Selected Aggregates relating to Manufacturing I-O Sectors and PFCE to Gross Value of Added (GVA) of 'Other Services'.**

Ratios (as percentage of GVA of 'other services')	**IOTT 2007-08**		**IOTT 1993-94**
	'New' definition	**'Old' definition**	
(1)	(2)	(3)	(4)
1. GVO of 'other services' in Manufacturing I-O sectors	14.2	8.2	46.0
2. Intermediate consumption of 'other services' in Manufacturing I-O sectors	29.2	21.1	32.6
3. PFCE of 'other services'	32.3	30.1	103.6

***Table 6*: Likely Overestimation of PFCE – based on Comparison of Input-Output Ratios obtained from ASI & ES of 2010 and IOTT 2007-08**

Broad description of the 'closed group'	$IC_{JW\text{-}WI}$ / GVO (%) (ASI & ES 2010-11)	IC_{WI} / GVO (%) (IOTT 2007-08)	PFCE /GVO (%) (IOTT 2007-08)	Likely over-estimation of PFCE (%)	NAS-NSS diff. (%) 2004-05
(1)	(2)	(3)	(4)	(5)	(6)
1. Tobacco products	10	10	84	12	45
2. Carpets & other floor coverings	10	Neg.	32	31	95
3. Textile and wearing apparel	8	15	50	17	57
4. Leather product	7	24	41	18	33
5. Wooden furniture	1	2	34	3	57

End Notes

① The manufacturing establishments covered under the Factories Act are surveyed annually under a scheme called *Annual Survey of Industries* (ASI). It provides statistical information on the organized manufacturing sector. In addition to activities relating to manufacturing processes and repair services, it also covers activities relating to gas and water supply and cold storage.

The Enterprise Surveys (ESs) on unorganised manufacturing is meant for collection of data on those manufacturing enterprises that are not regulated under Sections 2m(i) and 2m(ii) of the Factories Act. For the other economic activities, viz. trade, transport, hotel & restaurant, storage & warehousing and services, the ESs cover all the private (not public) enterprises. The Enterprise Surveys conducted by the NSSO are nationwide sample surveys and are carried out on different non-agricultural economic activities. Each of these surveys covers the entire geographical area of the country, except a few inaccessible pockets. The Enterprise Survey on unorganised manufacturing conducted in the 56th round was carried out for collecting data only on the unregistered manufacturing, i.e. those that are not regulated under Sections 2m(i) and 2m(ii) of the Factories Act. The enterprise survey of the 67th round however had a wider coverage. Besides the unregistered manufacturing units, defined the same way as above, it covered all unincorporated enterprises in the non-agricultural sectors, excluding those engaged in construction and electricity, gas & water supply.

The primary manufacturing units enumerated in both enterprise surveys and ASI is an establishment - a factory in the case of ASI and a manufacturing unit located whether within or outside the owners' household for the enterprise surveys.

Throughout this paper, the results of ASI and ES are combined to obtain estimates of the manufacturing sector as a whole, notwithstanding that the reference periods of the two surveys are different. While the data in ASI are collected with financial year (April to March) as the reference period, the ESs are always conducted with a moving reference of one month during survey period extending over agricultural year (July to June).

② *Exclusion of Repairing Services from the Datasets*: The NIC 2008, used both in the ASI 2010-11 and ES'67, provides for a separate 2-digit code (33) for repairing services. Thus, the units with repairing services as their main activity could easily be detected and excluded from the datasets of ASI 2010-11 and ES'67. But, it was difficult to remove such units from the datasets of ASI 2000-01 and ES'56, since in the NIC 1998 used for these surveys, the activity of repairing services was included in a few of 5-digit level codes for manufacturing activities, namely 35111, 35112, 35113, 35121 and 35122. Thus, the identification and elimination of the repairing units from the data sets of ASI 2000-01 and ES'56 are based on an assumption that units reporting the above NIC codes and value of sale of products less than 10 per cent of the income received from services were repairing units. Though the cut-off of 10 per cent is rather arbitrary it ensures that the main activity of the units thus identified would be repairing services.