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Global INTAN Invest

Intangible Assets in the Global Economy

Better Data for Better Policy

Estimating intangible assets for the Brazilian economy: methods and data description

Technical report

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1 Introduction

This report offers an overview of the sources and methods employed for constructing the estimates for Brazil in the Global INTAN-Invest database. The report illustrates both the data on intangible investments measured in official national accounts and the estimates of intangible assets not included in national accounts, following the methodology outlined in EUKLEMS&INTANProd (2023). In what follows, we present the main data sources and methods for national and non-national accounts (non-NA) intangibles; for this latter, we show the main steps for computing both the purchased and own-account components of intangibles.

The sources of information rely on official statistics, with the National Accounts Statistics (SCN, Portuguese acronym) for Brazil, published by the National Statistical Office (IBGE, Portuguese acronym), serving as a main information source. The information on gross fixed capital formation (GFCF) by asset, including intangible assets (i.e., intellectual property products), from National Accounts is only available for the total economy, with no industry detail. To compute the non-NA estimates, we rely on the Use Tables elaborated by the IBGE and on the Relação Anual de Informações Sociais (RAIS, Portuguese acronym). We use the information from the USE tables to generate industry-level estimates of non-NA components, but the results are disseminated at the aggregate level to ensure coherence with the intangible assets computed by national accounts.

The remainder of this document is organized as follows. In Section 2, we illustrate the coverage of different indicators in the National Accounts Statistics for Brazil, also showing data by asset. Section 3 presents the methodology for computing the purchased and own-account components of non-NA intangibles respectively. Section 4 presents the main results and trends for the Brazilian economy, covering the period 2010 to 2021. Finally, Section 5 outlines the next steps.

2 Capital accounts

The data source to measure Gross Fixed Capital Formation (GFCF) by asset is the National Accounts Statistics of Brazil, providing information for the total economy for the assets shown in Table 1 below.

The first category, **construction**, is split into two assets: Residential, including buildings or specific parts of buildings used for housing; and Other Buildings and Structures covering non-

residential buildings, other structures, and land improvements, such as warehouses and industrial buildings, commercial buildings, among others.

The category **machinery and equipment** incorporates three components: 1) *Transport Equipment* including motor vehicles, ships, locomotives, airplanes, among others; 2) *Information, Communication, and Telecommunications* (*ICT*) E*quipmen*t referring to hardware and telecommunications devices; 3) *Other Machinery and Equipment* covering other type of equipment such as engines, pumps, tractors, nuclear reactors, and others.

The **intellectual property products** embrace two main categories: 1) *Research and Development* (*R&D*), that is the value of expenditures on creative work conducted systematically to increase the stock of knowledge, and to apply this knowledge in new ways. In the Brazilian data, R&D is mainly considered non-market—thus, estimated on the basis of production costs. 2) *Software and Databases* and *Mineral Exploration and Evaluation.* Software consists of programs, for both systems and applications, while databases are organized data files that allow effective access to and use of information. The latter consists of the value of expenses related to the exploration of oil, natural gas, and other deposits, as well as the subsequent evaluation of any new deposits discovered. The value of this asset is measured by the resources allocated to exploration during the accounting period. Finally, the category other fixed assets includes other type of assets not classified elsewhere.

Table 1: Asset disaggregation in National Accounts. Brazil.

Components of Gross Capital Formation
Total
Gross Fixed Capital Formation
Construction
Residential
Other buildings and structures
Machinery and Equipment
Transport equipment
ICT equipment
Other machinery and equipment
Intellectual Property Products
Research and Development
Software, databases, exploration and mineral evaluation
Other fixed assets
Change in Inventory

Notes: This table presents the asset breakdown in Brazilian National Accounts. Own elaboration based on IBGE.

In contrast to what is observed for most of the countries included in the Global INTAN-Invest database, Brazil disseminates *Software and databases* aggregated with other intellectual property products (OIPP) - more specifically with *Exploration and Mineral Evaluation*. Also note that,

unlike European countries and the US, Brazil does not produce estimates for Entertainment, literary and artistic originals (one component of national accounts intangibles).

We estimate investment in software and databases and in other intellectual property products (OIPP) by leveraging detailed product-level information from the Supply and Use Tables (SUT). The central step in this procedure involves calculating internal shares from the SUT in order to disaggregate the broader investment category "software, databases, and mineral exploration", as reported in the National Accounts.

First, we identify the relevant product codes in the SUT corresponding to software and databases on the one hand and to other OIPP items (such as mineral exploration and artistic originals) on the other.[1] Based on these, we compute the relative shares of software and databases versus other OIPP within their combined total investment. These SUT-derived shares are then applied to the aggregate investment figure from the National Accounts, allowing us to break down the total into two consistent and detailed components: investment in software and databases, and investment in other OIPP.

Lastly, given that the information on GFCF by asset is only provided at current prices, we convert them into constant prices. The methodology can be found in section 3.3.

3 Measuring intangibles not included in National Accounts: Methods and sources

The estimates for *Design, New Financial Products, Brand, and Business Organization* is based on the same methodology adopted in the EUKLEMS&INTANProd database (EUKLEMS&INTANProd 2023)[2]. These are generated adopting an expenditure approach aimed at capturing expenditures on the acquisition of these assets. This expenditure can take two forms: firms purchase the inputs related to intangible assets from external sources (purchased components) and/or they produce them internally for their own use (own-account components). In

1 For OIPP we used codes 06801, 58001, and 59801 and for Software and databases we used 62801. Table 5 provides a detailed description of the product codes belonging to these assets.

2 For the time being, Training will not be measured as any suitable database has been identified to estimate this asset for India.

terms of data sources, the former relies on the Use Tables from the National Supply and Use Tables (SUTs), whereas the latter is obtained using microdata on labor outcomes from administrative records (RAIS).

In the remainder of this section, we will explain the data sources and methodology for each component in further detail.

3.1 Purchased component

The main variable and data source for measuring the purchased component is intermediate consumption from the Use Tables. For Brazil, we use the Use Tables from the IBGE, available for the years from 2010 to 2021 at different levels of disaggregation for products and industries.

To compute investment for the purchased component we use the more disaggregated tables with information on 68 industries and 128 products. The industry classification of the supply and use tables is a subset classification of the National Classification of Economic Activities (CNAE, Portuguese acronym) 2.0, which is the same industry disaggregation used in the Brazilian System of National Accounts (SCN, Portuguese acronym), 68 level.[3] Furthermore, the CNAE 2.0 is compatible with the International Standard Industry Classification (ISIC) Rev. 4 at 2-digit level.[4]

The product classification also corresponds to the ones used in the SCN level 68. Table 2 describes the products used for each asset and provides a comparison with those used for the estimates for the European countries.[5]

3 The correspondence table between the industry aggregation and the CNAE 2.0 can be consulted under the Table 'Tradutor Atividade - CNAE'. They were not included it in the present report because of space limitations.

4 Nevertheless, there are some differences in some industries. This can be consulted in Appendix A. Given that these industries are not related to industries that produce intangible assets, it does not represent a caveat for our estimations.

5 More specifically, in the SCN product classification, the products linked to our assets of interest related to the following CNAE 2.0 industries. ***Architectural and engineering services (SCN Code 71802)***: Architectural services (CNAE 7111); Engineering services (CNAE 7112); Technical activities related to architecture and engineering (CNAE 7119); Technical testing and analysis (CNAE 7120). ***Advertising and other technical services (SCN Code 73801)***: Advertising agencies (CNAE 7311); Advertising space agency, except in communication vehicles (CNAE 7312); Advertising activities not previously specified (CNAE 7319); Market and public opinion research (CNAE 7320); Interior design and decoration (CNAE 7410); Photographic and similar activities (CNAE 7420); Professional, scientific and technical activities not previously specified (CNAE 7490); Veterinary activities (CNAE 7500). ***Legal, accounting and consultancy services (SCN Code 69801)***: Legal activities, except notaries (CNAE 6911); Notaries (CNAE 6912); Accounting, accounting and tax consultancy and auditing activities (CNAE 6920); Company headquarters and local administrative units (CNAE 7010); Business management consultancy activities (CNAE 7020).

As for operating models, the product of interest is consulting services, which is not available as a separate product in the SUTs but is included in the product Legal, accounting and consultancy services (SCN Code 69801). We therefore estimated the proportion that corresponds to consultancy services. To do this, we build a weight to represent the share of consultancy services in the total asset using information on gross sales from the Annual Services Survey (PAS, Portuguese acronym) for the industries M69 to M70. More specifically, we compute the annual share of consultancy services in total gross sales from Legal, accounting and consultancy services industry. This is in line with what is done for the European countries, for which the consulting services are also aggregated.[6]

Table 2: Comparison between EU and Brazilian products/assets

Asset	**EUKLEMS & INTAN-Prod**	**Brazil Use Tables**
Attributed designs	Architectural and engineering services, technical testing and analysis services (CPA M71)	Architectural and engineering services (SCN Code 71802)
Market research and brand	Advertising and market research services (CPA M73)	Advertising and other technical services (SCN Code 73801)
Operating models	Management consulting services (CPA M702)	Included in Legal, accounting and consultancy services (SCN Code 69801)

6 For the European countries, management consultancy services are included in the broad product category CPA M69_M70. Thus, to estimate consultancy services, the expenditure corresponding to this broad category is adjusted with the share of turnover of NACE M702 (consulting services) in total turnover of NACE M69_M70 from Structural Business Statistics. The share is country-industry invariant.

Notes: This table presents the classification of assets in the EUKLEMS & INTANProd database (second column) and the Brazilian SUT Tables (third column).

3.2 Own-account components

We estimate the own-account component for organizational capital, brand, design, and new financial products using a cost-based approach, following the EUKLEMS&INTANProd (2023) procedure. This is consistent with the approaches adopted by national statistical offices to compute own-account investment in software and databases. Estimates are based on the information on employment and wages by occupation and by industry, and on compensation of employees, to be perfectly harmonized with the estimates from national accounts. In what follows, we will describe the data sources we use.

Relação Anual de Informações Sociais (RAIS). Micro-data are from the Annual List of Social Information (RAIS) a comprehensive public dataset on Brazil's formal labor market including matched employer-employee data. It is an administrative database published by the Brazilian Ministry of Labor and Employment providing data for all formal firms annually as requested by the official governmental agencies. The dataset encompasses a wide range of data on both firms and employees since 1985. It includes information on wages, occupations, sector, gender, age, size of establishment, and type of firm, among others. Due to data availability from the current national accounts, we use the RAIS data since 2010.

The calculation of own account investment starts from identifying the occupations involved in producing each intangible asset and assigning them a percentage of the working time devoted to producing the asset. As for occupations, starting from 2003 it uses the Brazilian National Classification of Occupations (CBO, Portuguese acronym) at 6-digit level, which is compatible with the International Standard Classification of Occupations version 1988 (ISCO-88). This implies that some adjustments are needed to find the relevant intangible occupations in ISCO-88 given that for the European countries, US and Japan ISCO-08 is used. Therefore, to identify the occupations that are relevant to our assets of interest, we adjust the time allocations that were originally built under the ISCO-08 for the European countries to the occupations of interest in ISCO-88. The rationality behind this is that most of the relevant ISCO-08 occupations at 3-digit levels are found within the 4-digit ISCO-88. For the rest of the cases, the time allocation can be adjusted by assuming a certain proportionality of the 4-digit occupations. Table B.1 in the Appendix displays the time use assumptions for European countries and the adjustments for Brazil.

Concerning the industry classification, since 2006 it used the CNAE 2.0 at 4-digit levels. The CNAE 2.0 is compatible with the ISIC Rev. 4.[7]

We calculate the share of the wage bill in intangible-related occupations within each industry, relative to the industry's total wage bill (see detailed steps in Box 1) using the data from RAIS. This is obtained aggregating the wage bill by industry and occupation-industry cells, accounting for differences in employment status (full-time or part-time) and duration of employment within each year. We first compute the monthly wage bill separately for full-time and part-time workers.[8] Then, to get the total monthly wage bill, we sum the full-time wage bill and half of the part-time wage bill (to reflect their proportional contribution).

Compensation of Employees The compensation of employees (hereafter, CE) by industry is available from 2010 onwards in the Use Tables.[9] Notice that the remuneration of employees computed in the national accounts includes the informal sector. This information is obtained from the National Annual Household Survey (PNAD, Portuguese acronym), providing information on employees who do not contribute to social security and on self-employment which is not registered in the social security as well. Therefore, once we apply the shares computed from the RAIS to CE from national accounts we assume that the informal sector produces intangible assets for own final use in the same proportions as the formal sector. Thus, this becomes an upper benchmark estimation of intangible assets, as the informal sector is unlikely to produce these assets in the same proportion as the formal one. Consequently, we also estimate a lower benchmark, assuming that the informal sector does not produce intangible assets at all. So we compute the CE with the information from the RAIS as it only covers the formal sector.

Methodology to compute own-account. Box 1 shows the steps to compute the own-account component. It is important to bear in mind that we estimate the own-account component under ***two scenarios***. The *first* assuming that the informal sector produces intangible assets in the same

7 Refer to A for further details on the compatibility between CNAE 2.0 and ISIC Rev. 4.

8 This calculation involves multiplying the average monthly wage by the number of workers in both full-time and part-time positions. For both groups, we weight the calculation by the proportion of months worked within the year (i.e., a weight between 0 and 1).

9 We use compensation of employees from the use tables as the industry disaggregation is more detailed that then one provided in the SCN.

proportion as the formal one (i.e., by using compensation of employees from national accounts); and the *second* assuming that the informal sector does not produce intangible assets at all (i.e., it computes investment excluding the informal by using compensation of employees computed with the RAIS). The results and the implications for the total economy are illustrated in the next section.

BOX 1. STEPS TO COMPUTE INVESTMENT IN OWN-ACCOUNT FOR EACH YEAR OF THE PLFS

1. We compute the wage bill in occupation o and industry i (W_{oi}) by multiplying the average wage ($\bar{w}_{oi}$) and the total number of employees (N_{oi}) in each occupation-industry cell.

$$\mathrm{W}_{oi} = \bar{w}_{oi} \times N_{oi},$$

2. We assume that workers employed in a certain occupation o that produces asset a spend $x\%$ of their time in the production of the asset of interest. We then multiply the wage bill in each occupation-industry cell by the time allocation coefficients that correspond to each asset of interest.[a]

$$\mathrm{W}^{a}_{oi} = \mathrm{W}_{oi} \times \tau^{a}_{o}, \qquad \tau^{a}_{o} \in \{0, 1\}$$

Where τ^{a}_{o} is the time allocation coefficient for occupation o and asset a

3. We aggregate the wage bill across all occupations involved in the production of each of the assets by industry.

$$\mathrm{W}^{a}_{i} = \sum_{o} \mathrm{W}^{a}_{oi},$$

4. We compute the total wage bill in each industry by multiplying the average wage and the total number of employees in each industry.

$$\mathrm{W}_{i} = \bar{w}_{i} \times N_{i},$$

5. We compute the ratio between Step 3 and Step 4 for each of the four assets.

$$\omega^{a}_{i} = \frac{\mathrm{W}^{a}_{i}}{\mathrm{W}_{i}},$$

[a] In principle, we are using the same time allocations that are used for the European countries. Nevertheless, this might be revised in a later stage.

BOX 1. STEPS TO COMPUTE INVESTMENT IN OWN-ACCOUNT FOR EACH YEAR OF THE PLFS

6. We multiply the shares obtained for each asset-industry in Step 5 (ω_i^a) by CE in each industry, ensuring compatibility with national accounts. In this sense the labor cost of asset a for industry i is given by:

$$\mathrm{CE}_i^a = \mathrm{CE}_i \times \omega_i^a,$$

7. Finally, we apply the blow-up factors. The main assumption of the cost-based approach is that the value of an asset can be obtained as the sum of the costs sustained for producing it. The benchmark equation to be estimated is as follows:

$$Y_i^a = CE_i^a + IC_i^a + CK_i^a + T_i^a,$$

where a is the asset type, Y is the value of the produced asset a at basic prices in industry i, CE_i^a is the labor cost of the relevant personnel measured as compensation of employees, IC_i^a are intermediate costs related to the activity, CK_i^a refers to the costs of capital services and T_i^a to net taxes on production related to these activities. The labor cost component can be estimated based on data on employment of relevant occupation, but other costs component can hardly be observed and needs to be estimated. The standard approach, adopted in EUKLEMS&INTANProd too, is to account for the sum of these components by multypling the estimated labor cost component by a blow-up factor, bp_i^a. Thus, the value of the produced asset is determined as:

$$I_i^a = CE_i^a \times bp_i^a$$

where bp_i^a is a blow-up factor that accounts for other cost components besides the compensation of employees and essential to develop a measure of output consistent with national accounts.

3.3 Estimating investment in volume terms

To measure investment in intangible assets in volume terms, we follow the methodology outlined in EUKLEMS&INTANProd. Real investment for each asset is calculated by dividing its nominal investment flow by an appropriate price index. Further, since national accounts provide investment by asset only in current prices, we construct real investment estimates for all assets included in the national accounts to enable comparison. Table 5 in the Appendix details the specific products used

to estimate the deflators for each asset. We rely on gross output deflators derived from the Brazilian Supply and Use Tables.

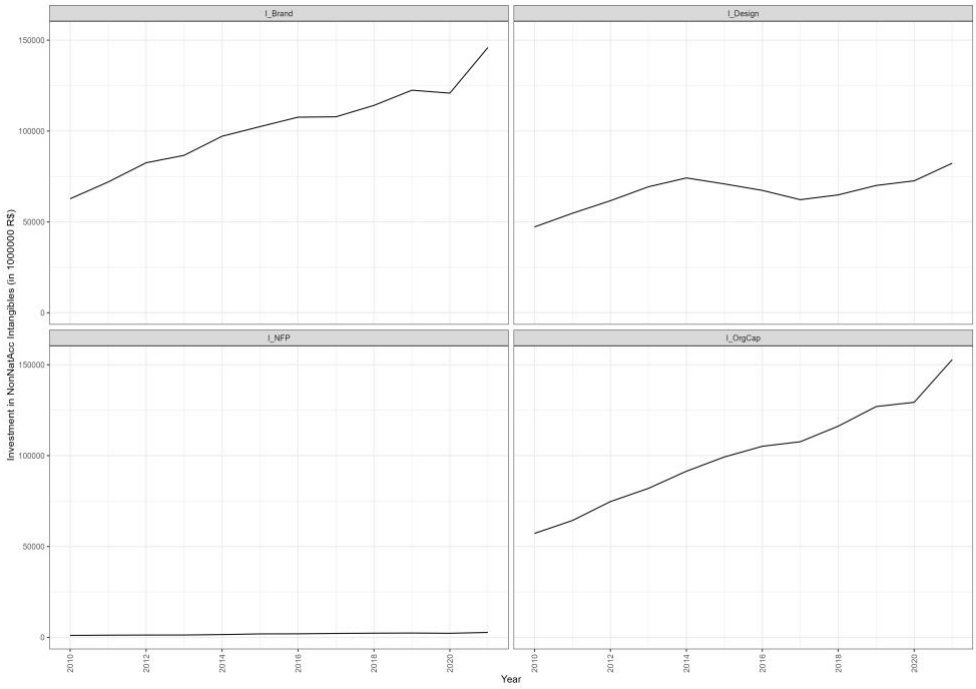
Real investment is computed using annual chain-linked measures, whereby quantity indexes are linked across consecutive periods to construct a consistent time series, following the same procedure applied in EUKLEMS&INTANProd.

4 Preliminary results & main trends

In this section, we present the results of our preliminary estimates as well as the main features of intangible investment in the Brazilian economy.

Figure 1 shows that there is a positive trend for the four components of non-NA intangible assets, with investment in organizational capital being by far the lead asset.[10]

Figure 1: Total investment in Non-National Accounts Intangible Assets. Total economy.



Notice that the purchased component accounts for the largest share of investment in intangibles from non-national accounts, as can be seen in **Error! Reference source not found.** in Appendix

10 Figures C.1 and C.2 in Appendix C show the analogue chart for the purchased and the own-account component respectively.

C. This is different compared to other countries, for which the own-account component is usually the largest driver of non-national account intangible assets.[11]

In the rest of the section, we provide some descriptive statistics and stylized facts about the relevance of intangible assets in the Brazilian economy.

Stylize fact 1. The share of intangibles in GDP is close to the share of investment in tangible assets and intangible investment has proved to be resilient to economic downturns. Figure 2 shows the share of total intangibles (national accounts and non-national accounts estimates), including the informal sector (*scenario one*). The share of intangible assets is around 6% over the whole period. Data in Figure 3 suggest two key insights: First, the share of investment in intangible assets is not vastly different from that in tangible (excluding residential) assets. On average, intangible investment accounts for 6.4 of GDP, while tangible investment (excluding residential) accounts for 7.2% over the period from 2010 to 2021. Second, tangible asset investment is pro-cyclical, with a marked decline during the economic downturn of 2016–2017. In contrast, investment in intangible assets remains relatively stable over time, demonstrating resilience during the crisis—a pattern consistent with the evidence for other countries developed so far (WIPO and Luiss Business School (2024)).

Figure 3 presents the percentages under the second scenario, where we assume that the informal sector does not produce intangible assets. As a result, the share of intangible assets in GDP is slightly lower at 5.5% (average across 2010-2021). However, the key insights previously mentioned remain consistent under this assumption.

These estimates align closely with prior efforts to measure intangible investment in Brazil. While the data sources are not strictly the same, Dutz et al. (2012) estimated that intangible assets accounted for about 4% of GDP during the period from 2000 to 2008.

11 To corroborate our results, we have cross-checked that investment in national accounts intangibles as well as total gross fixed capital formation from the Use Tables are consistent with the assets and total GFCF from national accounts, as explained in Section 2.

Figure 2: Share of tangibles and intangibles in GDP (current prices)

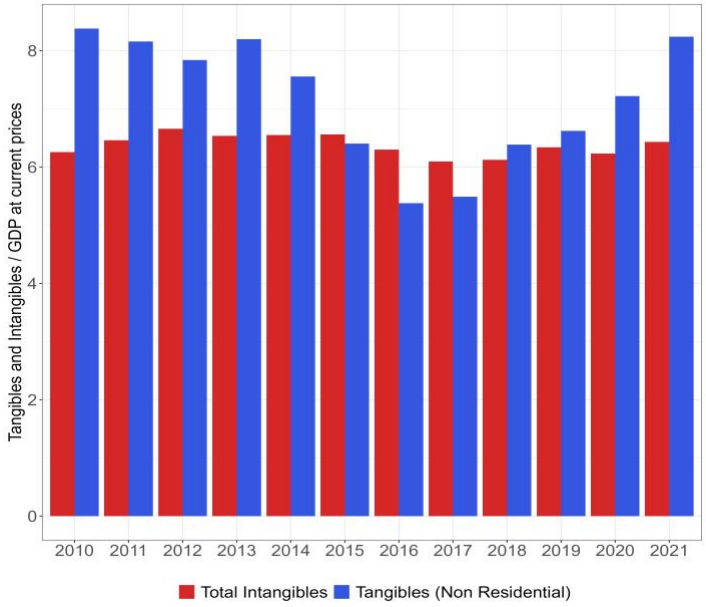
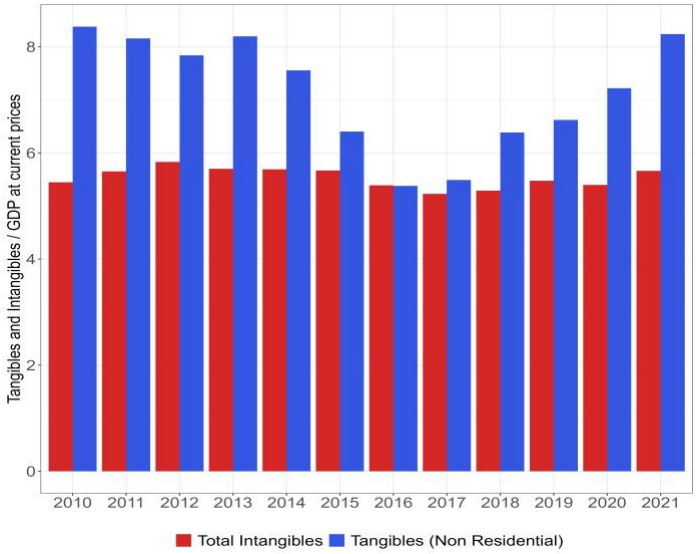


Figure 3: Share of tangibles and intangibles in GDP (current prices). Only formal sector



Stylized fact 2. Intangible Assets not included in national accounts are the main drivers of total intangible investment in Brazil. Figure 4 and Figure 5 show the share of national and non-national accounts assets in total intangibles for the total economy, including and excluding the informal sector, respectively. In both cases, intangible assets not captured by official statistics represent the largest share (70% and 65% of total intangible investment, depending on whether the

informal sector is included or not), highlighting the importance of their potential role in the economy.

Stylized fact 3. Organizational capital, brand, and software and databases are the most relevant components of intangible investment. Figure 6 and Figure 7 show the composition of assets in total intangibles investment for the total economy including and excluding the informal sector respectively. Consistent with trends observed in other countries, organizational capital is the most relevant asset, followed closely by brand. Notably, investment in software and databases has been increasing rapidly, peaking at approximately 25% and 29% in 2021, depending on whether the informal sector is included.

Figure 4: Share of National Accounts and Non-National Accounts Intangibles in total intangibles

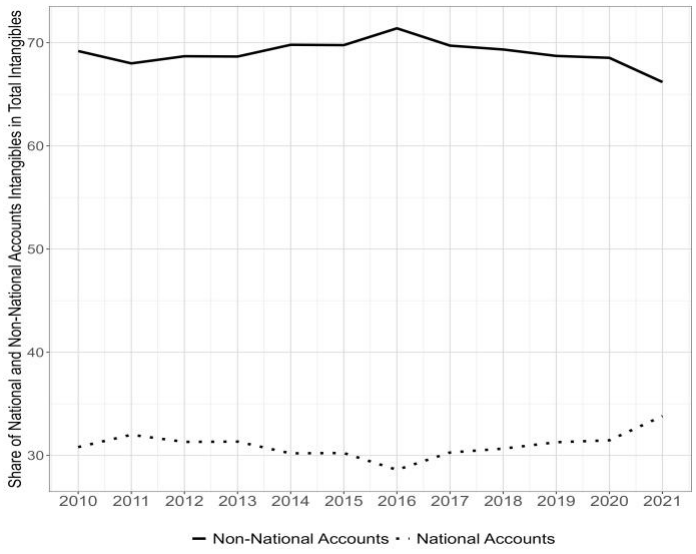


Figure 5: Share of National Accounts and Non-National Accounts Intangibles in total intangibles. Only formal sector.

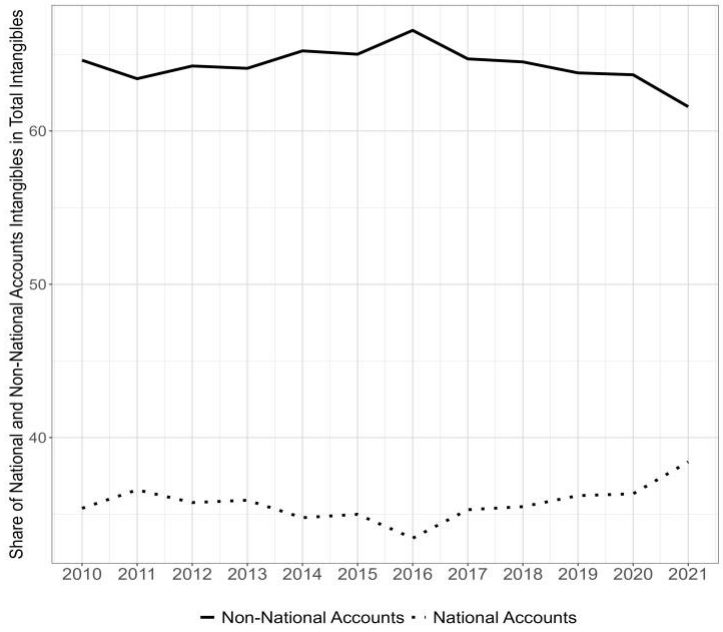


Figure 6: Composition of assets in total intangibles.

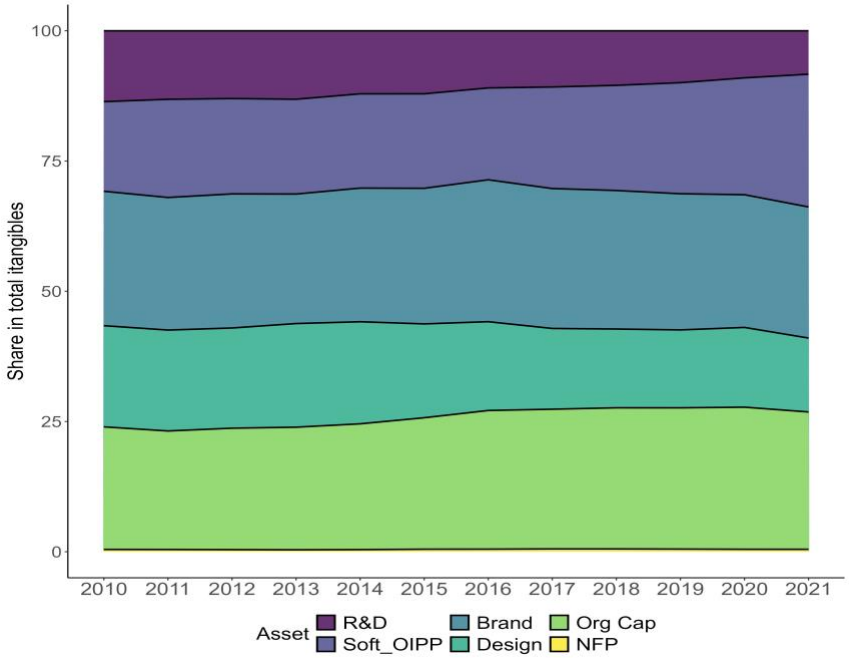
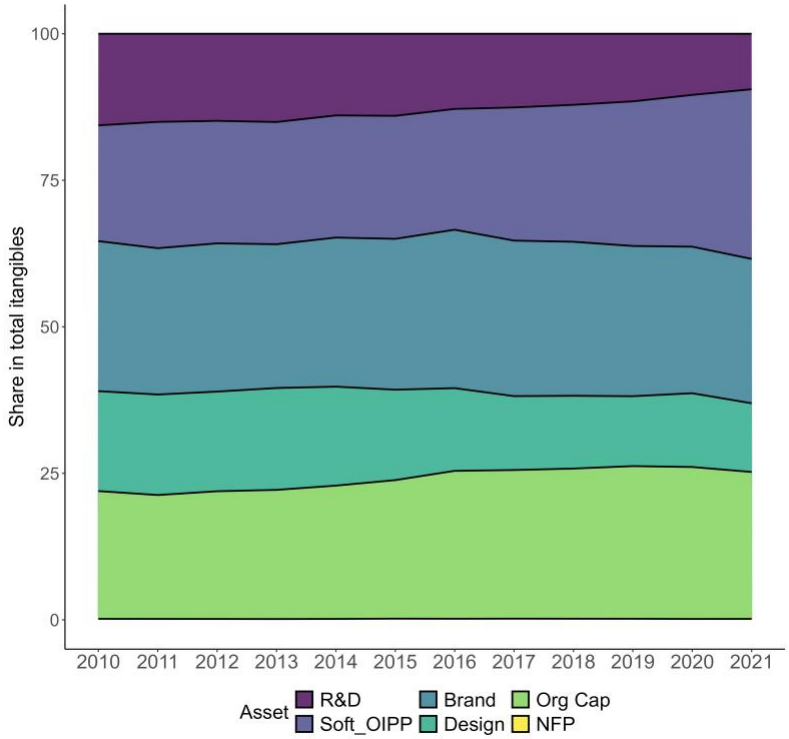


Figure 7: Composition of assets in total intangibles. Only formal sector.



5 Next Steps

In this section, we provide an overview of the forthcoming steps essential to completing our estimations. We will refine our estimates of intangible assets in non-national accounts for the informal sector to achieve a harmonized version that allows comparisons across the countries that will be progressively included in Global INTAN-Invest. In the case of Brazil, we will use the PNAD, which is the labor survey source referenced in the national accounts.

6 References

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7 Appendices

7.1 Data

7.1.1 A.1. Differences between CNAE 2.0 and ISIC Rev. 4 at 2-digit level

In this section we will describe the main differences between the CNAE 2.0 and ISIC Rev.

4. This information has been extracted from the correspondence tables between the CNAE 2.0 and ISIC Rev. 4.0 from the National Comission of Classification (CONCLA, Portuguese acronym) from the IBGE.[12]

Division 15/Divisions 16 and 22 The CNAE 2.0 includes in the manufacture of footwear (15), the manufacture of parts of footwear, which in ISIC Rev. 4 are in divisions 16 (parts of wooden footwear) and 22 (parts of plastic and rubber footwear). In Brazil, the manufacture of footwear, including parts by independent producers, is organized in integrated regional clusters.

Division 19/Division 20 The CNAE 2.0 includes in division 19 the manufacture of biofuels, which in ISIC/CIIU 4 is in Division 20, manufacture of chemical products. Fuel alcohol from sugarcane has significant production in Brazil, either in the form of anhydrous alcohol (anhydrous ethyl alcohol fuel), used in mixture with gasoline, or in the form of hydrated alcohol, used directly as fuel. It was deemed more appropriate to treat the manufacture of alcohol, along with the manufacture of other biofuels, in the grouping that brings together the production of other fuels (division 19 Manufacture of coke, petroleum-derived products, and biofuels). Previous versions of CNAE already addressed alcohol production in a corresponding division (division 23 in the previous version of CIIU/ISIC). In division 19, the production of biofuels comprises a specific group (19.3), which allows, for international comparison purposes, alternative treatment.

Division 62/Division 58 CNAE 2.0 addresses the activity of editing custom and noncustom computer programs in division 62, along with information technology services activities, while CIIU/ISIC 4.0 includes it in division 58, which brings together all forms of editing (books, magazines, newspapers, etc.).

Division 64/Division 70 CNAE 2.0 addresses all holdings in division 64, group 64.6

12 As the information is originally in Portuguese, it has been translated into English. To read the original documentation in Portuguese, refer to CONCLA-IBGE.

Activities of holding companies, with two specific classes for holdings of financial institutions and non-financial institutions. In CIIU/ISIC 4.0, a distinction is made between holdings that only own the capital, classified in division 64, group 64.2 Activities of holding companies, and holdings that perform management/administration/command activities of the group of companies they lead, classified in division 70, group 70.1 Activities of the head office.

Division 85/Division 88 CNAE 2.0 includes daycares in division 85 as part of early childhood education, forming a specific class 85.11-2 Early Childhood Education – daycare, while CIIU/ISIC treats this activity in division 88 along with social services without accommodation. CNAE 1.0 already adopted this treatment. The decision to treat daycares along with educational activities took into account two issues: the educational content of the activity and the tendency of educational policies to incorporate them into their scope. Defining a specific class for daycares allows, for international comparison purposes, alternative treatment.

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7.2 Time use assumptions coefficients for Brazil

Table 3: Time use assumptions coefficients for Brazil

ISCO_08_ title	ISCO-08_title	ISCO-88 4d	ISCO-88_4D_title	TIME USE FOR EU COUNTRIES (at 3-digits)				TIME USE FOR BRAZIL			
				Org Cap	Brand	Design	NFP	Org Cap	Brand	Design	NFP
111	Legislators and senior officials	1110	Legislators					0,2	0	0	0
111	Legislators and senior officials	1120	Senior government officials					0,2	0	0	0
111	Legislators and senior officials	1130	Traditional Chiefs and Heads of Villages					0,2	0	0	0
111	Legislators and senior officials	1141	Senior Officials of Political-Party Organisations	0,2	0	0	0	0,2	0	0	0
111	Legislators and senior officials	1142	Senior Officials of Employers', Workers' and other Economic-Interest Organisations					0,2	0	0	0
111	Legislators and senior officials	1143	Senior Officials of Humanitarian and other Special-Interest Organisations					0,2	0	0	0
112	Managing directors and chief executives	1210	Directors and chief executives	0,2	0	0	0	0,2	0	0	0
121	Business services and administration managers	1231	Finance and Administration Department Managers	0,2	0	0	0	0,2	0	0	0
122	Sales, marketing and development managers	1233	Sales and Marketing Department Managers	0,2	0,15	0	0	0,2	0,15	0	0
122	Sales, marketing and development managers	1234	Advertising and Public Relations Department Managers					0,2	0,15	0	0
131	Production managers in agriculture, forestry and fisheries	1221	Production and Operations Department Managers in Agriculture, Hunting, Forestry and Fishing	0,2	0	0	0	0,2	0	0	0
132	Manufacturing, mining, construction, and distribution managers	1222	Production and Operations Department Managers in Manufacturing	0,2	0	0	0	0,2	0	0	0
132	Manufacturing, mining, construction, and distribution managers	1223	Production and Operations Department Managers in Construction	0,2				0,2	0	0	0
133	Information and communications technology service managers	1226	Production and Operations Department Managers in Transport, Storage and Communications	0,2	0	0	0	0,2	0	0	0
134	Professional services managers	1227	Production and Operations Department Managers in Business Services	0,2	0	0	0	0,2	0	0	0
141	Hotel and restaurant managers	1225	Production and Operations Department Managers in Restaurants and Hotels	0,2	0	0	0	0,2	0	0	0
142	Retail and wholesale trade managers	1224	Production and Operations Department Managers in Wholesale and Retail Trade	0,2	0	0	0	0,2	0	0	0
211	Physical and earth science professionals	2111	Physicists and Astronomers					0	0	0	0,5
211	Physical and earth science professionals	2112	Meteorologists	0	0	0	0,5	0	0	0	0,5
211	Physical and earth science professionals	2113	Chemists					0	0	0	0,5
211	Physical and earth science professionals	2114	Geologists and Geophysicists					0	0	0	0,5
212	Mathematicians, actuaries and statisticians	2121	Mathematicians and Related Professionals	0	0	0	0,5	0	0	0	0,5
212	Mathematicians, actuaries and statisticians	2122	Statisticians					0	0	0	0,5
214	Engineering professionals (excluding electrotechnology)	2142	Civil Engineers					0	0	0,5	0
214	Engineering professionals (excluding electrotechnology)	2143	Electrical engineers					0	0	0,5	0
214	Engineering professionals (excluding electrotechnology)	2144	Electronics and Telecommunications Engineers	0	0	0,5	0	0	0	0,5	0
214	Engineering professionals (excluding electrotechnology)	2145	Mechanical Engineers					0	0	0,5	0
214	Engineering professionals (excluding electrotechnology)	2146	Chemical Engineers					0	0	0,5	0
214	Engineering professionals (excluding electrotechnology)	2147	Mining Engineers, Metallurgists and Related Professionals					0	0	0,5	0
216	Architects, planners, surveyors and designers	2141	Architects, Town and Traffic Planners	0	0	0,5	0	0	0	0,5	0
241	Finance professionals	2419	Business Professionals Not Elsewhere Classified	0	0	0	0,25	0	0,14	0	0,071
243	Sales, marketing and public relations professionals	2419	Business Professionals Not Elsewhere Classified	0	0,5	0	0				
331	Financial and mathematical associate professionals	3434	Statistical, Mathematical and related associate Professional	0	0	0	0,25	0	0	0	0,25

7.3 C. Descriptive Statistics

Figure 8. Investment in the purchased component of Non-National Accounts Intangible Assets. Total economy

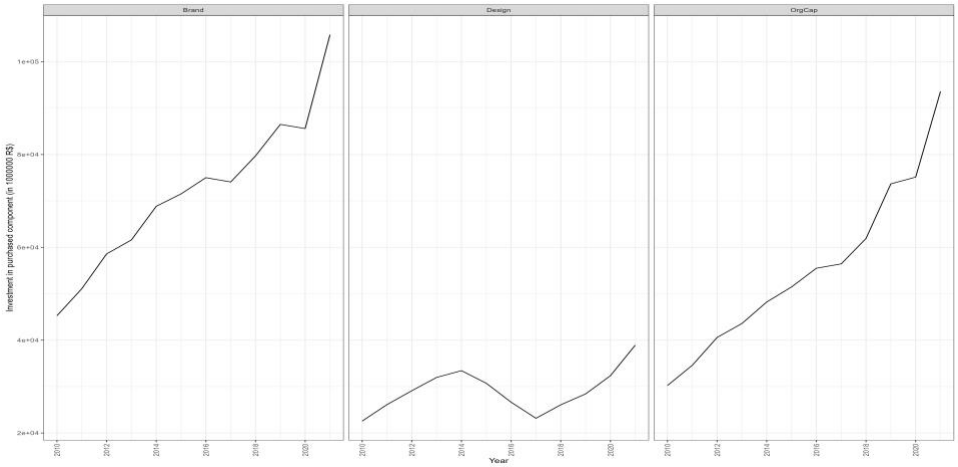

Figure 9: Investment in the own-account component of Non-National Accounts Intangible Assets. Total economy.

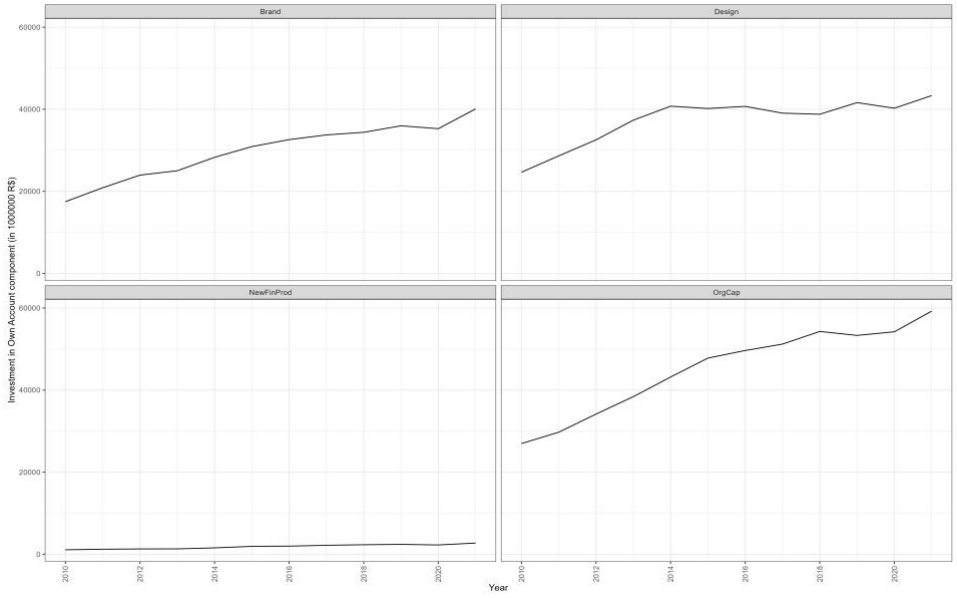

Table 4: Participation of the purchased component in total non-national accounts investment including and excluding the informal sector

year	Brand	Design	OrgCap	Brand (only formal)	Design (only formal)	OrgCap (only formal)
2010	72,2	47,8	52,9	83,6	62,5	65,5
2011	71,0	47,7	53,8	82,8	61,6	66,2
2012	71,0	47,2	54,3	82,5	61,0	66,4
2013	71,1	46,1	53,2	82,6	60,5	65,1
2014	70,9	45,1	52,8	82,3	60,2	64,5
2015	69,8	43,3	51,8	81,7	58,6	64,1
2016	69,7	39,6	52,8	82,1	55,9	65,1
2017	68,7	37,2	52,4	81,1	53,4	64,6
2018	69,9	40,2	53,3	81,9	56,7	65,2
2019	70,6	40,6	58,0	83,4	58,9	69,9
2020	70,8	44,6	58,1	83,4	62,6	70,6
2021	72,5	47,3	61,2	84,2	65,1	73,2

Table 5. Products used for price deflators for national accounts assets and intangible investment not measured in national accounts

Product_code	Product_portuguese	Product	Asset	Classification
41801	Edificações	Buildings	I_Rstruc	construction
41802	Obras de infra-estrutura	Infrastructure works	I_Rstruc	construction
41803	Serviços especializados para construção	Specialized construction services	I_Rstruc	construction
41802	Serviços de arquitetura e engenharia	Architectural and engineering services	I_Rstruc	construction
41801	Edificações	Buildings	I_Ocon	construction

41802	Obras de infra-estrutura	Infrastructure works	I_Ocon	construction
41803	Serviços especializados para construção	Specialized construction services	I_Ocon	construction
29911	Automóveis, camionetas e utilitários	Automobiles, vans, and utilities	I_TraEq	mach_and_equip
29912	Caminhões e ônibus, incl. cabines, carrocerias e reboques	Trucks and buses, including cabins, bodies, and trailers	I_TraEq	mach_and_equip
29921	Peças e acessórios para veículos automotores	Parts and accessories for motor vehicles	I_TraEq	mach_and_equip
30001	Aeronaves, embarcações e outros equipamentos de transporte	Aircraft, vessels, and other transportation equipment	I_TraEq	mach_and_equip
33001	Manutenção, reparação e instalação de máquinas e equipamentos	Maintenance, repair, and installation of machinery and equipment	I_TraEq	mach_and_equip
16001	Produtos de madeira, exclusive móveis	Wood products, excluding furniture	I_OMach	mach_and_equip
24912	Semi-acabacados, laminados planos, longos e tubos de aço	Semi-finished products, flat, long, and steel tubes	I_OMach	mach_and_equip
25001	Produtos de metal, excl. máquinas e equipamentos	Metal products, excluding machinery and equipment	I_OMach	mach_and_equip
26004	Equip. de medida, teste e controle, ópticos e eletromédicos	Measuring, testing, control, optical, and electromedical equipment	I_OMach	mach_and_equip
27001	Máquinas, aparelhos e materiais elétricos	Electrical machines, appliances, and materials	I_OMach	mach_and_equip
27002	Eletrodomésticos	Household appliances	I_OMach	mach_and_equip
28001	Tratores e outras máquinas agrícolas	Tractors and other agricultural machinery	I_OMach	mach_and_equip
28002	Máquinas para a extração mineral e a construção	Machinery for mining and construction	I_OMach	mach_and_equip
28003	Outras máquinas e equipamentos mecânicos	Other mechanical machinery and equipment	I_OMach	mach_and_equip
31801	Móveis	Furniture	I_OMach	mach_and_equip

31802	Produtos de industrias diversas	Products from miscellaneous industries	I_OMach	mach_and_equip
33001	Manutenção, reparação e instalação de máquinas e equipamentos	Maintenance, repair, and installation of machinery and equipment	I_OMach	mach_and_equip
26002	Máquinas para escritório e equip. de informática	Office machines and IT equipment	I_ICT	mach_and_equip
26003	Material eletrônico e equip. de comunicações	Electronic material and communication equipment	I_ICT	mach_and_equip
01917	Laranja	Oranges	I_others	other_fixed_assets
01918	Café em grão	Coffee beans	I_others	other_fixed_assets
01919	Outros produtos da lavoura permanente	Other permanent crop products	I_others	other_fixed_assets
01921	Bovinos e outros animais vivos, prods. animal, caça e serv.	Cattle and other live animals, animal products, hunting, and services	I_others	other_fixed_assets
01923	Suínos	Swine	I_others	other_fixed_assets
01924	Aves e ovos	Poultry and eggs	I_others	other_fixed_assets
02801	Produtos da exploração florestal e da silvicultura	Products of forestry and silviculture	I_others	other_fixed_assets
62801	Desenvolvimento de sistemas e outros serviços de informação	Systems development and other information services	I_Soft_DB	ipp
71801	Pesquisa e desenvolvimento	Research and development	I_RD	ipp
06801	Petróleo, gás natural e serviços de apoio	Oil, natural gas, and support services	I_OIPP	ipp
58001	Livros, jornais e revistas	Books, newspapers, and magazines	I_OIPP	ipp
59801	Serviços cinematográficos, música, rádio e televisão	Film, music, radio, and television services	I_OIPP	ipp
69801	Serviços jurídicos, contabilidade e consultoria	Legal, accounting, and consulting services	I_OrgCap	non_nat_intang
71802	Serviços de arquitetura e engenharia	Architectural and engineering services	I_Design	non_nat_intang
73801	Publicidade e outros serviços técnicos	Advertising and other technical services	I_Brand	non_nat_intang

71801	Pesquisa e desenvolvimento	Research and development	I_NFP	non_nat_intang