Cellule d'Analyse de Politiques Economiques du CIRES

Global Development Network

« *Doing Research in Social Sciences* »

EVALUATION OF THE ENVIRONMENT OF RESEARCH IN SOCIAL SCIENCES:

THE CASE OF THE IVORY COAST

FINAL DRAFT REPORT

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Executive Summary

1. After the end of the post-electoral crisis, the Ivory Coast engaged in a process of economic emergence by adopting a National Development Plan (Plan National de Développement, or PND) for the 2012-2015 period. Well aware of the crucial part played by scientific research in fostering economic development and contributing to the population's wellbeing, the Ivory Coast undertook a sustained program of reforms to improve the performance of institutions in charge of scientific research and innovation. The Global Development Network (GDN) shares this perspective: the organization has decided to support the public authorities' effort to promote the growth of scientific research in the country by sponsoring a case study on the Ivory Coast under its "Doing Research in Social Sciences" program, to help identify the country's strengths as well as the obstacles alleviating the production of scientific knowledge.

2. According to scientific literature, Research and Development in Social Sciences can contribute to creating innovation in organizational systems (public and private sectors, civil society, international bodies, etc.), which in turn can help optimize these institutions' action, rendering them more efficient. Economic growth cannot be lasting and self-sustained unless innovation is implemented across all systems and productive sectors.

3. This report was delivered in this perspective by the Economic Policies Analysis Committee (Cellule d'Analyse de Politiques Economiques, or CAPEC) of the Ivorian Center for Economic and Social Research (Centre Ivoirien de Recherches Economiques et Sociales, or CIRES). It aims to produce a nuanced and comprehensive diagnosis of the Ivory Coast's research environment and capacities in Social Sciences, and to recommend reforms in order to bring about quantitative and qualitative improvements in the production of knowledge, to inform decision-making and improve the population's wellbeing.

4. To achieve these objectives, we followed various methodological approaches. First of all, a literature review was carried out to set the outline of this research project; then a direct survey was undertaken amongst researchers and research institutions. The survey targeted three groups: research centers and institutes (35) and researchers (208). This research allowed us to design the "Doing Research in Social Science" (DRSS) Index, which was used to evaluate the Ivory Coast's research environment. This complex statistical index comprises of 6 dimensions, each reflecting a specific aspect of the inputs needed to improve the country's research environment.

The dimensions cover: the availability and quality of physical infrastructure and human capital; capacity building activities and incentives; documentary resources; information and communication technologies (ICT) and networking. Finally we developed an econometric model to capture the key determinants of scientific output.

5. Our diagnosis highlights weaknesses in the capacities of most research institutions, except for the Centre Suisse, which shows a DRSS Index of an acceptable standard (0,52). Research is facing major challenges in public universities in general and in particular in new institutions (Universities Lorougnon Guédé in Daloa and Péléforo Gon Coulibaly in Korhogo), whose DRSS Index is close to zero. This situation can be explained by the lack or

poor condition of infrastructure, by the researchers and institutions' scientific isolation, by poor access to good quality documentary resources and by the lack of capacity building activities targeted at researchers.

5. Actions undertaken to improve research capacities depend on the nature of each institution. Universities tend to focus on educational activities, with fewer resources for scientific activities such as research conferences or training sessions for research staff. Research centers (Centre Suisse, CIRES), whose prime vocation is research, are on the contrary more focused towards research promotion activities. The Ecole Nationale de Statistiques et d'Economie Appliquée (National School of Statistics and Applied Economics, or ENSEA) offers the best combination of education and capacity building, which benefits both teaching and research staff as well as students and research end-users.

6. When faced with these challenges, researchers with an interest in developing their skills and career are having to resort to private resources to ensure the quality of their scientific output: having a private Internet access, subscribing to a physical or electronic documentation center, individually taking part in national and international networks, or applying for research funding from international donors and research end-users.

7. The scientific output of Social Sciences research institutions in the Ivory Coast are for the most part produced by the academic sector, and mostly comprises of scientific theses (82%). The researchers' output mostly consists in research papers presented at national conferences and publications in national peer reviewed journals. It is motivated by the researchers' ambition to improve their academic career prospects, and is usually targeted at the scientific community: only 7,9%, 5,3% and 4,2% of researchers respectively target the population, the public sector or civil society. The DRSS Index confirms the strong performance of Rank A researchers-lecturers in the production of knowledge. The most dynamic researchers are Senior Lecturers ("maîtres de conferences"), and researchers are at their most productive between the ages of 45 and 55 years old.

8. An econometric analysis of the determinants of knowledge production shows that Dimension 3 (capacity building and incentives) is by far the main determinant amongst those identified by the DRSS Index as affecting the production of knowledge in Social Sciences. Researchers are impacted by their research environment, and more specifically by the opportunities offered in terms of capacity building and incentives. Other variables such as the researchers' age, number of dependent children and number of individual projects also appear to have a significant impact on researcher productivity.

9. Altogether, the findings of this study highlight the need for a revitalization of Social Sciences research, in line with the country's 2020 emergence goals.

10. Reforms need to focus on transforming the research environment, working conditions and incentives for researchers, as well as improving the research sector's governance. All research stakeholders (state, research institutions, researchers and end-users) should work together to regenerate, build and equip research facilities with good quality infrastructure, with a focus on access to data and ICT, while supporting networking activities. Beyond

research environments, the state must improve existing incentive mechanisms, for instance by offering exceptional bonuses to the most productive researchers whose findings make a real difference in improving policies and strategies in the private or public sector, or in the civil society. More funding should be allocated to capacity building activities in research institutions (seminars, conferences, forums, debates, conferences, training courses, etc.).

11. The sector's governance should return to focusing on defining and planning priorities for the development of scientific research. It should also encourage sector-based leadership in research activities to avoid the scattering of efforts and optimize knowledge transfer opportunities. Finally, consolidating international cooperation can help create new opportunities for researchers and develop a rapport of trust with end-users.

1. Introduction

Scientific research plays a strategic part in a nation's economic and social development policies: stimulating this sector should be a key priority in every nations' programs and decisions. The increased vitality of research and education activities in the global economy reflects the advent of a knowledge economy, where scientific research is both a source and an indicator of the country's economic and social development (Lin et al., 2014). The production of knowledge and skills generates positive externalities on production, consumption and market regulation activities as a whole.

The field of Human and Social Sciences combines the various scientific disciplines that study are men, women and the societies they live in. These sciences draw from diverse theories and methods; each has its own distinct history and is practiced by researchers within institutions that have their own distinct rules. In OECD countries, research funding has become a priority since the 2000s. This commitment was reflected by ongoing reforms of the research sector, supported by a diversification of funding channels[1] (OECD, 2013).

The evolution of research in Africa has followed a rather unique course. Research and innovation capacities keep deteriorating as a result of the mass commodification of higher education. The public R&D expenditure to GDP ratio remains below the 1% threshold recommended in 1980 by the Lagos Plan to meet development objectives. The key challenge will be to rebuild an autonomous research sector in Social Sciences with enough vitality to leverage structural and social transformation strategies in sub-Saharan countries.

To address the shortcomings of their research production and knowledge transfer systems, the Ivory Coast and Cameroon have undertaken reforms to improve the situation of scientific research, in particular in Social Sciences. According to a 2012 audit carried out by the Department of Higher Education and Scientific Research (MESRS), scientific research is affected by diverse obstacles at all levels: insufficient public budgets allocated to research with respect to the outcomes expected; unstable legal and institutional frameworks; poor knowledge transfer mechanisms; disorganized national and international cooperation between research structures; brain drain, etc. These challenges are in sharp contrast with the country's objectives in terms of development and capital growth, and in particular with the 2016-2020 NDP's strategic orientations, aimed at putting scientific research to the service of the country's harmonious development. This raises a number of questions: (i) What are the current standard and quality of Social Sciences research in the Ivory Coast? (ii) What are the decisive factors impacting Social Sciences research outputs and researcher productivity in the Ivory Coast? (iii) How can the sector of Social Sciences research be revitalized in order to meet the needs of development policies?

This study aims to bring relevant answers to the above questions.

[1] The research expenditure to GDP ratio varies from 2% to 5% in developed countries, and initiatives aimed at creating hubs of academic excellence or innovative research centres are currently being implemented.

1.1. Objectives of Study

This study's key objective is to document the current environment and state of play in social sciences research, and to analyze the determinants impacting the research output in research institutions and researcher productivity. Our ultimate purpose is to evaluate the quality of the research environment and better understand the issues affecting the production of research in the context of a developing country's emergence.

More specifically, we will: (i) deliver a comprehensive diagnosis of the research environment, to produce a quantitative and qualitative evaluation of capacities in Social Sciences research; (ii) investigate the factors that impact the production of research and the productivity of researchers in Social Sciences; (iii) issue economic policy recommendations to consolidate research outputs and knowledge transfers in Social Sciences.

In order to achieve the above objectives, this study uses data from a survey of 208 researchers and 27 research institutions carried out in 2015 in the Ivory Coast.

1.2. Research Hypothesis

This study's central hypothesis is the idea that the research environment has a positive impact on scientific output in Social Sciences. A better quality environment with modern infrastructure, incentives and ongoing capacity building activities creates favorable conditions for research. If, when placed in such an environment, a researcher shows a number of socio-demographic traits that are shown to be favorable to research activities (in that they do not interfere with the amount of time and effort dedicated to research), then this researcher is guaranteed to obtain scientific outcomes. We therefore postulate that the research environment and the researchers' socio-economic characteristics are key determinants of the production of knowledge in Social Sciences.

The rest of the report is structured as follows: section 2 gives a brief overview of the evolution of research in the Ivory Coast; section 3 presents this study's methodology; section 5 discusses the study's main findings.

2. Scientific Research in the Ivory Coast

2.1. The Evolution of Social Sciences Research

At the eve of the Ivory Coast's independence, scientific research was entirely French-led and revolved mostly around agriculture and forestry (Waast, 2001). Research was formalized and institutionalized from 1971, with the creation of the Department of Scientific Research (Ministère de la Recherche Scientifique or MRS). Due to a favorable economic climate, the country decided to build its economic and social development upon the Ivorian people's command of science, techniques and technologies. The Department's mission was to coordinate research institutions, and to develop a coherent and integrated national research strategy that could meet the country's development needs. Research in Social Sciences took a

step forward in 1977 with the creation of Université d'Abidjan[2] and of the main public and private professional schools.

Ivoirian research today is a multi-dimensional system that is relatively complex to manage. Initially designed to act as a driver for the country's cultural, social and economic development, scientific research turned out to provide an essential backup to the higher educational services delivered by universities and professional schools. Due to its multiple objectives in terms of training, scientific output, innovation and knowledge transfer, it is simultaneously a process, a product and a system. With the economic crisis, the staff per student ratio went from 1 to 10 in 1970 to 1 to 49 (Waast, 2001). Many researchers had to emigrate, while the most part have turned to consultancy activities in order to survive: this has caused research in Social Sciences to shift from its initial national priorities.

The current economic and political climate has favored the strategic planning of research activities, in line with the emergence objectives set out by the 2012-2015 NDP. In this context, the MESRS's General Directorate for Scientific Research and Technological Innovation elaborated a draft law on the organization and planning of research and technological innovation, while delivering a National Research Policy Document and an Inventory of Scientific and Technological Potential (IPST). Funding remains the main obstacle to the effective implementation of the strategic plan: support from technical and financial partners (TFP) could help revitalize research in Social Sciences.

2.2. The Stakeholders of Social Sciences Research

Three main groups of stakeholders drive the Social Sciences research sector: universities with their departments, faculties and laboratories; research centers and institutes; and researchers and teaching staff. The Ivory Coast has five (05) universities, four (04) professional schools ("grandes écoles") and over 180 private higher education institutions. Scientific research is for the most part carried out by public higher education institutions, while private institutions tend to focus on education and training. Four universities offer research and education in Social Sciences: Université Félix Houphouët-Boigny (or FHB, Abidjan-Cocody), Université Alassane Ouattara (Bouaké), Université Lorougnon Guédé (Daloa) and Université Péléforo Gbon Coulibaly (Korhogo). FHB is the largest in terms of student and staff numbers, and the one that offers the widest range of research subjects, with twelve (12) Social Science departments clustered into five (5) Education and Research Units (Unités de Formations et de Recherche, or UFR).

[2] Later renamed Université Nationale de Côte d'Ivoire, it comprises of 5 faculties including 3 in Social Sciences (Law, Economics, Literature and Human Sciences) and 2 in Fundamental and Medical Sciences (Science and Technology, Medicine).

Table 1: Social Science disciplines in public universities in 2013/2014

University	Total number of students	Number of departments	List of departments
Université Félix Houphouët-Boigny (UFHB)	66,517	12	Economics and Management, Law, Geography, History, Philosophy, Psychology, Sociology, Criminology, Anthropology, Art, Performing Arts, Music and Musicology
Université Alassane Ouattara, Bouaké	11,739	06	Economics, Law, Geography, Philosophy, History, Sociology
Université Lorognon Guédé, Daloa	2,802	06	Economics, Law, Geography, Philosophy, History, Sociology
Université Péléforo Gbon Coulibaly, Korhogo	2,943	06	Economics, Law, Geography, Philosophy, History, Sociology

Source: MERS, 2015 and CAPEC

Three public professional schools (or "grandes écoles") are involved in training and research in Social Sciences: Institut National Polytechnique Houphouët-Boigny in Yamoussoukro (INPHB), Ecole Nationale de Statistiques et d'Economie Appliquée (ENSEA) and Ecole Normale Supérieure in Abidjan (ENS). They are controlled by universities, although they benefit from a relative financial autonomy. These centers' scientific potential – for instance that of the Centre Ivoirien de Recherches Economiques et Sociales (CIRES) – enables them to raise funds and deliver a significant scientific output.

In 2014, the Ivory Coast had 3,832 researchers and academic staff, out of which 15,9% were females, for a total population of 22,671,331 – or a ratio of approximately 17 researchers per 100,000 inhabitants. In response to the sharp increase in student numbers, the State recruited 988 academics from 2012 to 2014. A large proportion of research and teaching staff are employed by UFHB and, within this institution, by Social and Human Sciences departments. There are four grades of researchers, following the same hierarchy as that used for higher education lecturers: Research Associate ("attaché de recherche"), Researcher ("chargé de recherche"), Senior Researcher ("maître de recherche") and Research Director ("directeur de recherche"). These grades follow the same pay scales as those used for Assistants, Lecturers, Senior Lecturers and Professors in Higher Education.

3. Methodology

We followed a three-stage methodology: (i) documentary review; (ii) collection of primary data from research stakeholders (institutions and researchers); (iii) statistical and econometric analysis of the data.

The literature review aimed to scope out existing studies and reports in relation with our theme. This allowed us to draw a comprehensive picture of research in Social Sciences, while

setting the key orientations of our diagnosis of the research environment in the Ivory Coast and fine-tuning our econometric analysis.

Data was collected through two separate surveys: one first questionnaire on the research environment and knowledge production was distributed in 35 randomly selected departments and centers, taking into account their location on the national territory. A second questionnaire was targeted at academics and researchers who were affiliated to research institutions. The sample was based on a list of academics and researchers provided by research institutions. This random sample was apportioned on the basis of gender and staff numbers in each research institution. A total of 295 researchers were selected.

The statistical analysis is based on the Doing Research in Social Science (DRSS) Index, which evaluates the facilities available for research in social sciences in research institutions ("DRSS-Research Institution"), as well as the researchers' capacity to produce knowledge ("DRSS-Researcher"). Both indexes are measured and analyzed using 6 out of the 7 dimensions of the DRSS Index: Physical Infrastructure (Dim1), Human Capital (Dim2), Capacity Building and Incentives (Dim3), Documentary Resources (Dim4), ICT (Dim5) and Networking (Dim7). The variables that make up Dimension 6 have not been taken into account when designing the questionnaire.

The econometric analysis looks at the findings of the estimates of the knowledge production econometric model. It allowed us to identify determinant factors both in terms of research environments and individual researchers.

4. Findings of Study

4.1. The Environment of Research in Social Science

Physical Infrastructure

The data collected through our survey of institutions shows that the availability of offices in each institution is in proportion with the institution's size and importance. ENSEA tops the list of institutions where most researchers have at least one office, although this sub-regional institution's key vocation is not research. Second on the list comes the Ivory Coast's oldest and largest university (UFHB), followed by the country's second largest city's university (UAO in Bouaké). The majority of researchers in other public universities, most of which have been recruited in 2013, do not have a dedicated office.

In addition, 54.29% of surveyed institutions have their own physical library, while 11.42% are sharing a physical library with another institution, and 34.29% do not offer their researchers access to a physical library. 88.57% of institutions do not have an electronic library. Considering that access to literature is essential for research, the proportion of

institutions that do not have a physical or electronic library remains a concern for the production of good quality research.

Human Capital, Social Capital and Networking

The values of the DRSS Index-Human Capital were calculated for universities and research centers. FHB University and the Centre Suisse de Recherche have the highest human capital, with a value of 0.18. They are followed by ENSEA (0.17), CIRES (0.10) and PGCK University (0.04), which became a university 3 years ago. The values are below 0.5 in all the institutions surveyed, due to the high proportion of Rank B staff (Research Assistant and Assistant Lecturer) with respect to Rank A staff (Senior Lecturer, Tenured Professor).

At researcher level, the DRSS Index for social capital and networking is the highest at ENSEA (0.22), followed by UFHB (0.20), ULGD (0.19), UPGCK (0.15) and UAOB (0.05). Collaboration – or researcher participation in research teams or learned societies – is particularly weak at UAOB.

Capacity Building and Incentives

Research institutions may organize or participate in seminars or training courses. Many departments organize this type of scientific activities on a national scale. On average, the Centre Suisse is the institution that organized the most national (24) and international (12) conferences over the past three years. On average, the CIRES is the research institution that has been associated with the most national (24) and international (12) conferences over the past three years. This is due to the fact that these institutions are research centers, whose activities focus on research in Social Sciences.

As is the case with infrastructure, the Centre Suisse and ENSEA remain the most privileged research institutions in terms of capacity building and other incentives (Table 12). With a DRSS Index for capacity building and incentives standing respectively at 0.65 and 0.45, these two institutions clearly stand out from the rest. Universities that focus on education to the detriment of research offer very limited scientific activities in terms of conferences and training sessions for academic staff. In its capacity as a public professional school, ENSEA combines education and capacity building activities that benefit both academic staff and researchers as well as students.

Documentary Resources

Library facilities are disappointing in surveyed institutions. A relatively limited number of researchers have access to libraries, both physical and electronic. 30.90% of researchers have a physical library in their research institution. Around 25.44% have one in their research center, while 42.21% have declared that they had one in their university. 19.71% of researchers have a library in their personal office.

Researchers are on average dissatisfied with the services offered by the physical or electronic libraries they have access to. On a satisfaction scale of 1 to 10, the maximal average score is 2.89/10 for physical libraries, and 1.74/10 for electronic libraries. This data reflects the poor quality or inadequate nature of documentary facilities, due to their poor condition, to the limited number of available documents and to the lack of up-to-date documents.

According to the DRSS-Documentation sub-index for research institutions, research bodies (Centre Suisse, CIRES) are better equipped in documentation infrastructures than universities such as FHB and the ENSEA. In addition UPGCK, which is more recent, has a lower index. Investment in this university was initially concentrated on education infrastructure (amphitheaters, lecture rooms, etc.) over research facilities such as libraries, even where those do also benefit teaching activities.

Information and Communication Technologies

Access to an Internet connection remains a major concern for researchers when it is supposed to be provided by their research institution. Very few researchers (30.6%) have access to an Internet connection within their home institution (see Table 14). This could be the cause of the researchers' personal investment in an Internet connection (89.64%). Access through a personal connection (6.17/10) is rated as more satisfactory than through a connection provided by the researchers' home institution (1.31/10) or another institution (1.96/10). This score reflects the research institutions' poor capacity in facilitating researchers' access to ICT, both qualitatively and quantitatively.

The ICT dimension of the DRSS index includes the availability of a computer room and its associated commodities, of an Internet connection and of professional software packages. The values for the DRSS-ICT sub-index are below 0.6 and very unequal (0.56 for the Centre Suisse against 0.02 for ENSEA). It is worth noting that at ENSEA, academic staff have access to offices equipped with computers with an Internet access.

Funding

Survey data indicates that over the past 3 years, the major part of the funding attributed for research projects, capacity building and publication bonuses was awarded to UFHB researchers. None of the researchers surveyed had received a capacity building grant. ENSEA stands ahead of other universities, with 25% of researchers having benefitted from research project funding from international institutions since 2011.

The "Doing Research in Social Sciences" (DRSS) Index

The observation of the various averages for the DRSS Index for research centers rates the Centre Suisse de Recherche as the research institution that offers the best working environment in terms of physical infrastructure (administrative offices, office commodities etc.). The average value of the infrastructure sub-index is for the Centre Suisse de

Recherche, 0.80 for ENSEA 0.63 for CIRES, 0.51 for U-FHB and just 0.28 for Korhogo's UPGC (see Table 2).

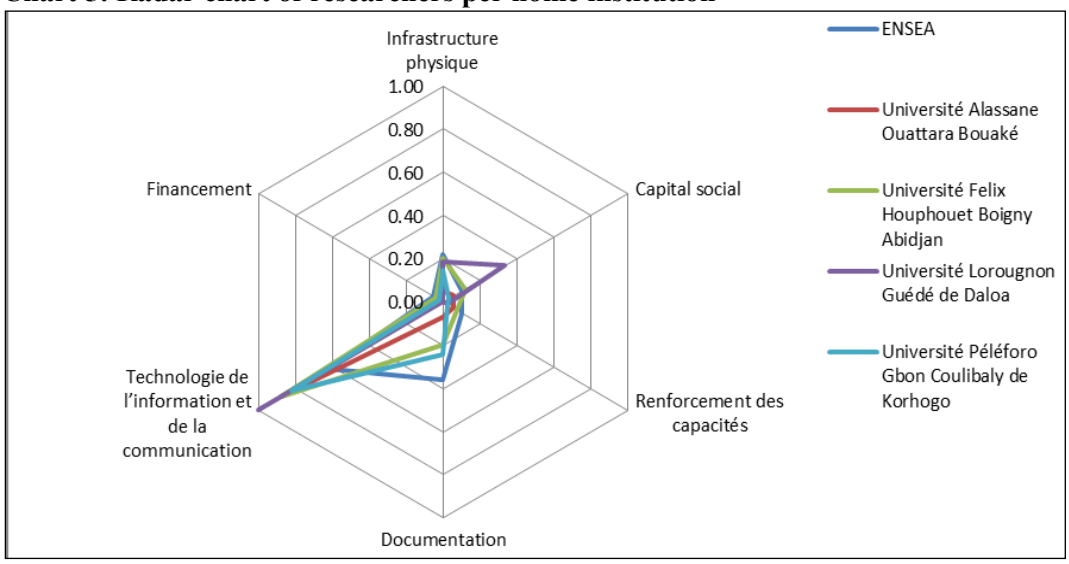
Tableau 2 : DRSS Index – research institutions

Research institutions	Physical infrastruct.	Human capital	Cap. building & incentives	Document.	ICT	Funding	Networking	DRSS	Statistics
UFHB	0,51	0,18	0,09	0,53	0,30	0,20	0,04	0,05	Average
	0,16	0,13	0,17	0,16	0,07	0,25	0,05	0,09	Standard dev
	0,20	0,02	0,00	0,25	0,04	0,00	0,00	0,00	Min
	0,80	0,40	0,75	0,75	0,32	0,50	0,18	0,24	Max
CIRES	0,63	0,10	0,13	0,54	0,22	0,24	0,24	0,13	Average
	0,24	0,19	0,14	0,20	0,19	0,34	0,19	0,16	Standard dev
	0,10	0,00	0,00	0,25	0,07	0,00	0,03	0,00	Min
	0,90	0,66	0,37	0,94	0,71	1,00	0,68	0,51	Max
ENSEA	0,80	0,17	0,45	0,50	0,02	0,00	0,00	0,00	Average
									Standard dev
	0,10	0,18	0,45	0,50	0,02	0,00	0,00	0,00	Min
	0,80	0,17	0,45	0,50	0,02	0,00	0,00	0,00	Max
CENTRE SUISSE	1,00	0,18	0,65	0,75	0,56	0,52	0,40	0,52	Average
									Standard dev
	1,00	0,18	0,65	0,75	0,56	0,52	0,40	0,52	Min
	1,00	0,18	0,65	0,75	0,56	0,52	0,40	0,52	Max
UPGC	0,28	0,04	0,01	0,25	0,07	0,00	0,09	0,00	Average
	0,05	0,02	0,01	0,00	0,00	0,00	0,06	0,00	Standard dev
	0,20	0,02	0,00	0,25	0,07	0,00	0,00	0,00	Min
	0,30	0,07	0,02	0,25	0,07	0,00	0,12	0,00	Max
Total	0,54	0,14	0,12	0,52	0,27	0,19	0,12	0,08	Average
	0,22	0,15	0,19	0,19	0,15	0,27	0,15	0,14	Standard dev
	0,10	0,00	0,00	0,25	0,04	0,00	0,00	0,00	Min
	1,00	0,66	0,75	0,94	0,71	1,00	0,68	0,52	Max

Source: Data Survey CAPEC-GDN, 2015.

The physical environment of research in Social Sciences appears more favorable in schools and research centers than in universities. The values of the DRSS Index-Researcher show that ENSEA researchers are more privileged in terms of physical infrastructure in comparison with those from public universities. The DRSS infrastructure score is 0.09 for ENSEA, 0.07 for UFHB and 0.04 for Korhogo's PGC University. The DRSS researcher index is relatively low in most institutions. Its value is acceptable at the Centre Suisse (0.52) but only reaches 0.13 at CIRES and 0.05 at UFHB. The index is close to zero at Korhogo's PGC University. Overall, the research environment in the Ivory Coast is far from satisfactory. Researchers are faced with constraints to do with physical infrastructure (offices, libraries, etc.), capacity building activities and incentives, and access to ICT (see Chart 5). Although some institutions such as the Centre Suisse, ENSEA and CIRES stand out from the rest for some aspects of this environment, this does not apply to public universities, which are home to 2/3 of researchers and academic staff.

Chart 5: Radar chart of researchers per home institution



Source: Data Survey CAPEC-GDN

The next section provides an outline of the standard of research output in this environment in the Ivory Coast.

4.2. Academic Output

This section investigates the outputs produced by the researchers of universities and affiliated research centers. We first captured the research units' global production and the researchers' individual output, based on the answers provided by surveyed institutions and individuals. We then looked at descriptive statistics linking academic output with the DRSS Index, its sub-indexes, and other variables. The fourth sub-section presents the results of a means difference test.

Academic Output at Department Level

The variable Knowledge Production ("Prod_Savoir") measures the average number of academic papers published by a researcher in national or international academic journals over the past three years, in relation with the average number of national publications per researcher in the same field over the same period. 65.71% of Ivoirian research institutions surveyed publish at least one scientific journal. Partnerships for the dissemination of research findings were established by 29.41% of surveyed research institutions. The bulk of scientific production in Social Sciences comprises of academic and professional theses (82%), including research theses (67%) and professional reports (15%).

Academic Output at Researcher Level

Type I Academic Output

Type I academic output includes mainly the presentation of research work at national conferences (17.62%) and publications in national peer reviewed journals (17.40%). Statistics show that male researchers are more prolific in their Social Sciences output than their female peers. Men produce on average 4 scientific pieces against 3 for women. The highest average output comes from researchers aged between 45 and 55 years old. The next age group (36-45) has an average output of 3.62 (about 4) scientific pieces. Veterans (55 and over) average an output of 2 scientific pieces.

Looking at grade, the highest scientific output in Social Sciences comes from rank A researchers, with an average output of 9 pieces for tenured professors against 6 for senior lecturers. Assistant lecturers come in third position with an average output of 4.62, or about 5, scientific pieces. The average output for an assistant is 2 pieces for those who hold a PhD and 0.72 for those who do not.

Université Félix Houphouët-Boigny is the institution whose researchers are the most active in terms of output, with an average of 4 scientific pieces, followed by UAOB and UPGCK (3 scientific pieces). ENSEA and ULGD produce respectively 2 and 1 pieces on average. The DRSS Index confirms the strong performance of rank A researchers in scientific output in Social Sciences. These results reflect a research production that is mainly focused on the academic world, and more specifically motivated by academic promotion.

Type II Scientific Production

It appears that the majority of researchers are not interested in Type II scientific output. A low proportion of surveyed researchers (31.12%) take part in conferences as resource persons. The next most popular type of output (28.85%) is acting as a referee in a journal. Few researchers carry out consultancy work, and those who do are commissioned by the national public sector (22.40%), international organizations (19.33%), the national private sector (16.18%), NGOs (14.10%) and other sectors of activity (4.49%).

4.3. Environment, Researcher Characteristics and Scientific Output

Statistical Analysis of the DRSS Index and Knowledge Production

The DRSS Index is relatively low in the Ivory Coast. Out of the 208 researchers who responded to the entire questionnaire, its average value is 0.06. Generally speaking, researchers in the Ivory Coast work in an environment that lacks the various dimensions covered by the Index. At least half of researchers have a DRSS Index of zero, as shown in Table 3.

Knowledge production is positively correlated with the researcher's age and number of dependents, the DRSS Index and the number of individual and collective projects pursued by the researcher. It is also positively correlated with all the variables covered by the DRSS Index's dimensions. However, the degree of correlation is higher for Dim3 (capacity building and incentives) and Dim2 (human capital). It has also been observed that the dimensions of the DRSS Index are generally positively correlated between them. There is a close link between available infrastructure and human capital, capacity building activities, documentary resources and networking between research centers. A statistical analysis of gender or grade gaps shows that gender and grade do not have a significant impact on the fluctuations of the knowledge production index.

Tableau 3: Descriptive statistics of the DRSS Index

Percentile		Smallest	
1%	0	0	
5%	0	0	
10%	0	0	Obs 208
25%	0	0	Sum of Wgt. 208
50%	0		Mean 0,0616361
		Largest	Std, Dev. 0,0904347
75%	0,132	0,298	
90%	0,211	0,303	Variance 0,0081784
95%	0,247	0,311	Skewness 1,217031
99%	0,303	0,375	Kurtosis 3,336884

Source: Data Survey CAPEC-GDN, 2015.

Researcher Characteristics and Research Output

We looked at gender, marital status, age group, place of issuance of PhD and grade within research institution. The data indicates that researchers aged 40 and under (youngest group) dedicate just over one (1) additional hour per week to research than older researchers. Researchers whose PhD was issued in the Ivory Coast dedicate on average 4.10 hours per week to research than those whose PhD was issued elsewhere. There is no difference in terms of time dedicated to research between males and females, married and unmarried researchers, Rank B (Assistant, Assistant Lecturer) and Rank B (Senior Lecturers, Tenured Lecturers) academics. This descriptive finding shows that time dedicated to research is mostly determined by the researcher's age and the place of issuance of their PhD. Younger, less experienced researchers with aspirations of promotion will tend to dedicate more time to research.

Table 4: Means comparison test for time dedicated to research

		Obs.	Means	Standard error	Difference	t	p-value
Gender	Male	240	21.75	1.28	-0.11	-0.0300	0.4880
	Female	34	21.65	2.75			
Marital status	Married	166	21.15	1.49	-0.98	-0.4190	0.3378
	Unmarried	110	22.12	1.77			
Age group	Age <= 40	120	23.98	1.90	**3.83***	1.6213	0.0530
	Age > 40	158	20.16	1.46			

Place of issuance of PhD	Ivory Coast	189	23.27	1.45	**4.10***	1.5725	0.0585
	Abroad	81	19.16	2.10			
Grade	Rank B	236	22.57	1.33	-3.58	-0.9143	0.1807
	Rank A	29	19	2.67			

NB : (***) significant by 1%, (**) significant by 5%, (*) significant by 10%.

Source: Data Survey CAPEC-GDN, 2015

Research Environment and Research Output

The research environment is captured on the basis of different variables reflecting access to a number of facilities. In terms of the amount of time dedicated to research, we have observed that researchers who have access to an electronic library, a database or a scientific journal within their university dedicate more time per week to research in comparison with their peers who do not have access to such facilities.

Researchers who have access to a physical library in their department, who have access to a database and those who have an Internet connection within their institution have published more than their peers who do not benefit from such facilities. Publications in international peer reviewed journals are more frequent from researchers who have access to a database.

Networking and Research Output

Variables to do with networking include belonging to a research center, to a research team or to a learned society. Statistics show that researchers who belong to a research center or a research team dedicate more time per week on average to research than those who do not belong to either: they dedicate an average of 6.17 more hours per week to research than those who do not belong to a research center. Researchers who belong to at least one research team dedicate on average 12.07 hours more per week to research than those who do not belong to a research team. Researchers who belong to at least one team also publish on average more than the others in national peer reviewed journals.

Incentives and Research Output

There is a significant difference in the number of hours dedicated to research per week between researchers who take part of funded national conferences and those who do not (researchers who take part in funded national conferences dedicate on average 3.80 hours more to research than those who do not). There is no significant difference in terms of publications in national and international peer reviewed journals.

4.4. Findings from Regression of Knowledge Production Model

This section presents and discusses the findings of the econometric approach aimed at investigating the key determinants of knowledge production, both in terms of the institutions' and the researcher's research environment and of the participants' socio-demographic characteristics. Two specifications were used to better capture the influence of variables on

knowledge production: the full model, integrating all 6 dimensions of the DRSS Index as well as the researcher's socio-professional characteristics, and the abridged model, using the synthetic DRSS Index.

Table 5: Determinants of knowledge production

Variables	Full model	Abridged model
Dim1	0,498 (1,32)	-
Dim2	0,673 (1,17)	-
Dim3	**2,423**** (3,69)	-
Dim4	0,586 (1,65)	-
Dim5	0,126 (0,48)	-
Dim7	0,135 (0,17)	-
DRSS	-	**2,835**** (3,93)
Age	**0,0221*** (1,99)	**0,0241*** (2,15)
Nbannées (Nbr Years)	-0,0148 (-1,61)	**-0,0173** [v] (-1,87)
NbEnfts (Nbr Children)	**0,0455**** (3,01)	**0,0398**** (2,62)
_Isexe_2 (Gender)	0,0813 (0,46)	-0,00075 (0,00)
_IEnseignan_1 (Teacher)	-0,1174 (-0,93)	-0,0594 (0,46)
_IPays_1 (Country)	-0,0934 (-0,65)	-0,132 (-0,91)
_IDomaine_1 (Field)	0,215 (1,07)	0,234 (1,15)
_IDomaine_2 (Field)	**0,395**[v] (1,68)	0,332 (1,39)
_IDomaine_3 (Field)	0,286 (1,14)	0,295 (1,16)
_IDomaine_4 (Field)	-0,0334 (-0,14)	-0,0666 (-0,27)
_IDomaine_5 (Field)	0,192 (0,75)	0,249 (0,97)
_IDomaine_6 (Field)	0,0273 (0,12)	0,0265 (0,11)
nbProjet (Nbr Projects)	**0,0907**** (4,88)	**0,0969**** (5,24)
nbCoProjet (Nbr collaborative projects)	0,0457 (1,41)	0,0500 (1,51)
_cons	**-1,204*** (-2,26)	**-0,854**[v] (-1,68)
	Obs. = 208 *F(15, 192)* = 7,44 *Adj* R^2 = 0,318	*Obs.* = 208 *F(20, 187)* = 6,59 *Adj* R^2 = 0,351

NB : (**) significant by 1%, (*) significant by 5%, ([v]) significant by 10%.

Source: Survey Data CAPEC-GDN, 2015.

For both models, the findings of the econometric estimates are globally significant. ***Knowledge production depends significantly on Dimension 3*** (Capacity building and

incentives), on the researcher's age, on the number of dependents and ***on the number of individual projects***. The influence of Dimension 3 is particularly strong and significant: a one point increase of the Index reflecting capacity building and incentives leads to a twofold increase in knowledge production, all other things being equal. This is the key channel through which the DRSS Index affects research outputs in Social Science.

Generally speaking the DRSS Index designed to measure the environment of research has a positive and significant impact on research outputs in the Ivory Coast. Researchers are therefore responsive to their research environment and more specifically to capacity building and incentives. The researcher's age, number of dependent children and number of individual projects have a positive impact on research output. Gender has no specific impact on this output, which confirms the results of the test for independence presented below. In addition, the researcher's field of study in Social Sciences does not appear to impact their scientific output.

5. Conclusion

This study aims to deliver a diagnosis on the environment of research in Social Sciences and to analyze the determinants of knowledge production in the Ivory Coast, to discuss the revitalization of the research sector based on the improvement of working conditions and the availability of capacity building activities for the various stakeholders. Our diagnosis highlights blatant weaknesses in research capacities in most research institutions, except for the Centre Suisse, which shows an acceptable DRSS Index. Research is faced with huge challenges in public universities, due to the lack or poor condition of infrastructure, to the scientific isolation of institutions and researchers, to poor access to good quality documentary resources and to insufficient researcher capacity building activities.

An econometric analysis of the determinants of knowledge production has shown that Dimension 3, which reflects capacity building and incentives, is by far the main channel through which the DRSS Index affects knowledge production in Social Sciences. Researchers are susceptible to their research environment, and in particular to the offering in terms of capacity building and incentives. Other variables such as the researcher's age, number of dependents and number of individual projects appear to have a significant impact on researcher productivity.

Altogether, the findings of this study call for the revitalization of scientific research in Social Sciences, in line with the objectives set out in the country's emergence strategy. Reforms aimed at improving the research environment, working conditions, incentives for researchers and the sector's governance need to be undertaken. All stakeholders need to combine their efforts to rehabilitate, build and equip research facilities, to provide lasting and good quality infrastructure. The state needs to improve direct incentive mechanisms for research, and increase its contribution to capacity building activities in research institutions. The sector's governance needs to return to identifying and prioritizing development projects for the scientific research sector, and support sector-based leadership in order to prevent the scattering of efforts and optimize knowledge transfers.

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