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Structural change and the National Initiative for Human Development in Morocco

Subnational insights

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Abstract: This paper aims to revisit the pace and patterns of structural change in Morocco with a renewed perspective focusing on subnational trends to document the macro patterns. In that perspective, we first build a within-country sectoral longitudinal dataset covering employment and value added (VA) that expands the international databases mostly used in the literature. Based on this novel dataset, our results shed light on the different contributions of subnational units (regions) to labour productivity growth and, subsequently, structural change. Taking advantage of this novel dataset, we use an instrumental variable (IV) strategy to estimate the impact of the National Initiative for Human Development (NIHD) programme on labour productivity growth and both of its components: the between (structural change) and the within components. We find that the NIHD programme positively affects productivity growth overall, mainly through structural change. The results are driven by urban areas and the participation of local actors such as associations or cooperatives in the management of NIHD projects.

Key words: structural change, human development, subnational, Morocco

JEL classification: O10, O14, O18, O47

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1 Introduction

The traditional path of economic development entails a well-documented process of structural transformation. Throughout this process, factors of production are reallocated from the low-productivity sector (agriculture) to higher-productivity sectors (industry, services), ultimately inducing more economic gains. Economies become increasingly dual as the gap between agricultural and non-agricultural sectors widens (Kuznets and Murphy 1966). Using historical data from 1800 to 2000, Herrendorf et al. (2014) provide evidence of such patterns for today's advanced economies that achieved higher income levels and sustained economic growth. Successful emerging economies in Asia, including China, South Korea, Malaysia, and Indonesia, follow similar structural change paths (Szirmai 2012).

The contribution of structural change in labour productivity growth has gained a lot of interest in pursuit of understanding the income growth trajectory of developing countries. Typically, a growth-enhancing structural change occurs when production factors, here labour, move from low-productivity to higher-productivity sectors (McMillan et al. 2014). Conversely, structural change might contribute negatively to income growth when the reallocation of labour occurs from high-productivity to low-productivity sectors. Evidence shows that episodes of higher labour productivity growth are concomitant with substantial growth-enhancing structural transformation, as illustrated in the case of advanced or even some Asian economies (de Vries et al. 2015; McMillan et al. 2014).

The structural transformation is mostly analysed from the macro perspective in the literature. This approach assumes homogeneity within each sector across a country is quite strong for countries typically characterized by significant differences between subnational units (Escobar and Mühlen 2019). This assumption implies that economic structures (employment and value-added (VA) shares) and productivity levels are similar across the subnational units within a country, which appears quite inaccurate. Indeed, some regions may be relatively more productive in a sector while others may be unproductive in the same sector. Hence, the labour reallocation towards that sector may have an opposite contribution to the structural change process, depending on the region. This assumption is lessened in recent literature that documents the structural change process at a subnational level (state or region). Such a disaggregated approach is relatively demanding in terms of data as it supposes that sectoral VA and employment data are available at the subnational level. Generally, sectoral data in developing economies are computed at the national level. Limited attention has been given to the subnational perspective of structural change so far; the few existing studies document mainly Asian experiences (India and China) and, more recently, Mexico and Ghana (Ashad and Mitra 2017; Escobar and Mühlen 2019; Jiang 2011; Paul and Raju 2021; Thind and Singh 2018).

In this paper we seek to revisit the pace and patterns of structural change in Morocco with a renewed perspective focusing on subnational trends to document the macro patterns. Our starting point is to build a within-country sectoral longitudinal dataset covering economy-wide sectoral employment and VA that expands the international databases frequently used in the literature (de Vries et al. 2015; Kruse et al. 2023). Our Moroccan Economic Transformation Database (METD) provides comprehensive and harmonized sectoral data at the subnational level over the period 2001–18, consistent with the recent GGDC/UNU-WIDER Economic Transformation Database (ETD) (Kruse et al. 2023). Contrary to most of the recent literature adopting a subnational perspective, we take advantage of the METD to make it possible to connect national-level patterns of sectoral data in the ETD with subnational trends within the country. Existing studies document structural change patterns solely in the major states in China and India (Ashad and Mitra 2017; Jiang 2011; Thind and Singh 2018). In the African context, Paul and Raju (2021) investigate the barriers to growth-enhancing structural transformation focusing on the reallocation of labour from informal to formal sectors within the non-farm sectors. To the best of our knowledge, Escobar and Mühlen (2019) is the only study that connects countrywide structural change with subnational-level patterns in the case of Mexico. Their results shed light on the importance of

accounting for differences between subnational units in the analysis of the structural change process. Hence, this paper contributes to the growing literature that improves the measure of structural change by taking into account subnational heterogeneities.

This work is closely related to Escobar and Mühlen (2019) as we similarly explore the countrywide structural change process while considering subnational differences. However, we distinguish from them in that we harmonize the subnational data with the macro-level ETD, allowing a comparison with the existing studies, particularly those investigating the Moroccan context (Ait Ali and Msadfa 2016; Mouelhi and Ghazali 2021; Moussir and Chatri 2020). Using mostly the ETD, evidence in Morocco suggests that the process of structural change is marked by three periods that also emerge in other studies analysing large samples of African countries (de Vries et al. 2015; McMillan et al. 2014). Morocco has experienced significant growth-enhancing structural change during the independence years (1960–75) that might stem from the first stage of industrialization (Elmorchid 2018). This was followed by the period 1975–2000, characterized by a growth-reducing structural change (Elmorchid 2018). Finally, there is quite a consensus in the literature regarding the growth-enhancing dimension of structural change since 2000, suggesting a reallocation of labour from low-productivity to higher-productivity sectors (Elmorchid 2018; Moussir and Chatri 2020).

Our paper differs from the literature studying the developing world setting in many regards. First, we release the homogeneity assumption by accounting for subnational differences in economic characteristics.[1] Taking Morocco as a study case, this assumption seems quite invalid as it means that sectoral productivity level and economic structure in the Casablanca-Settat region, for instance, are similar to those in all the other regions. Casablanca-Settat is characterized by service and industrial activities, while the agricultural sector represents a considerable proportion of some regions such as Souss-Massa. Hence, we discuss further the implications of releasing that assumption by contrasting our results with the literature. This paper contributes to the debate on the relevance of considering subnational differences in the analysis of structural change processes.

Second, we study the structural change in the Moroccan setting by adopting a Shapley decomposition framework to decompose the change in national output per capita similarly to Martins (2019). In fact, this framework is broader and encompasses the typical shift-share method that is traditionally used in the literature (Mouelhi and Ghazali 2021; Moussir and Chatri 2020). The standard shift-share method divides national labour productivity growth into two components, namely between-sector[2] and within-sector effects. The between-sector component represents our measure of structural change in practice following the common approach in the literature (McMillan et al. 2014). The within-sector effects refer to productivity change related to capital accumulation or improved technology. In addition to these two components, Martins's (2019) broad framework accounts for the impact of demographic changes through labour participation, employment, and working-age population. Such an analytical framework is particularly relevant to the Moroccan context, which has been experiencing a profound modification of the population structure that might also affect the income growth path. Since the 2000s, evidence suggests that the country has been undergoing a demographic transition (Elmorchid 2018). Indeed, the fertility rate has significantly fallen while life expectancy has substantially increased during the last five decades (Sajoux and Nowik 2010). Hence, our paper documents the potential gains commonly referred to as demographic dividends, which may arise from fertility rate changes and, subsequently, the dependency ratio.

[1] Employment and VA shares, labour productivity.

[2] de Vries et al. (2015) decompose further the between-sector component into static and dynamic effects.

Third, within this broad framework, we explore further the role of the flagship National Initiative for Human Development (NIHD[3]) programme on labour productivity growth and its distribution through both of its components, namely the within-sector and between-sector (hereafter structural change). We leverage on the regional variation in productivity growth and the NIHD funding share collected from administrative data. Our empirical strategy consists of estimating the impact of NIHD funding share on labour productivity growth and on both of its components. Our baseline specification is a fixed effects regression model that accounts for time-invariant unobserved heterogeneity. Our main concern is that the baseline estimates may be confounded with time-variant unobserved factors. For instance, NIHD funding includes the contribution of local partners, which may reflect improvement in leadership and unobserved managerial skills of local actors. We adopt an instrumental variable (IV) strategy to address this potential endogeneity issue. We instrument the total NIHD funding with the government share, arguably exogenous to local partners' unobservables. Our core identifying assumption exploits the NIHD governance and institutional architecture following the literature on aid-project impacts on economic performance (Andersen et al. 2022; Kraay 2012, 2014). We rely on two arguments to support that the government share is predetermined and therefore uncorrelated with unobserved local partners' characteristics (see more discussion in Section 4.2). First, there is a time lag between the decision to allocate government funds to regions and the signature of the financial agreement to fund projects. Second, the decision-making regarding resource allocation is centralized at a higher institutional level.

Our paper also contributes to the growing literature connecting structural change and economic development policy in developing countries. Recent literature is interested in policy reforms embedded in programmes, such as the structural adjustment programmes, to explain structural change pace and patterns in these economies. For instance, Konte et al. (2022) investigate how the effects of structural reforms on labour productivity are distributed between the structural change and within components. These reforms mostly consist of modifying laws regulating trade, product markets, and financial sectors. Their results suggest that most of these structural reforms operate mainly through the intrasectoral component, validating the underlying assumption that these structural reforms reduce rigidities mostly within sectors. Hence, our results complement the literature as we find evidence of a human-based strategy positively affecting productivity growth through the structural change component. Our findings show that a 10 percentage point (pp) increase in NIHD funding share results in a 2.3 pp impact on structural change.

The NIHD programme was launched during a period of accelerated productivity growth (from 2005). It also entails major reforms which are of a different kind from structural reforms analysed by Konte et al. (2022) in two aspects. Contrary to the law-based structural reform programmes in Konte et al. (2022), the NIHD is a direct intervention consisting of funding projects across several sectors (income-generating activities, infrastructure, social, etc.) that are designed to meet the needs of poor and vulnerable people living nationwide. The NIHD is a central pillar of the Moroccan development strategies launched in 2005, which feature the human dimension prominently at the core of the programmes, with interventions comprehensively addressing multiple social areas. In addition to projects on health or education sectors, this programme encompasses economic projects designed to support income-generating activities across diverse sectors, including agriculture, tourism, trade, small industry, and handcrafts (ONDH 2016). These projects can be categorized as belonging to one of four groups or components during the first phase of the NIHD programme.[4] Such projects may contribute to boosting productivity by releasing

[3] Initiative Nationale du Developpement Humain (INDH) in French.

[4] The programme is presented in detail in Section 2.

financial and capital constraints, which are also part of distortions. Subsequently, they may contribute to the economic structural change of the beneficiary locations.[5]

Moreover, the NIHD programme has been accompanied by major reforms in governance, with the adoption of a bottom-up approach that relies on consultative and community-driven projects, as opposed to a traditional top-down approach. The top-down approach, in which the project management is centred at the government level, arguably generates cumbersome bureaucracy that may prevent the efficient allocation of resources within and across sectors. The bottom-up approach contrasts this type of approach and has been operationalized through shared management of the NIHD between the government and local actors. Local actors, such as communes or even associations and cooperatives, are involved in the management of the projects. They also contribute to the overall funding programme. Looking at the mechanisms of the NIHD programme, our results add to the literature by providing evidence of the differential effects of the programme regarding the type of location (rural/urban), the components, and the project manager.

The regional perspective is particularly relevant for the case of Morocco as the regions are at the core of the paradigm of development strategies. In 2011 the country launched the advanced regionalization programme to make the most of each region's potentialities and strengths to ensure balanced economic development across the territories. Even in the New Development Model launched in 2019 the territories are central to the policy-making process. This will shed light on the contribution of a major dimension of development strategies in structural change so far. The database produced at the end will provide a basis for monitoring and evaluation of the New Development Model in terms of economic transformation which may serve to inform policy decision-making.

The rest of the paper is organized into five sections. Section 2 provides the background of the NIHD programme. Section 3 presents in detail the METD. Section 4 presents the methodology used to investigate the role of the NIHD programme in labour productivity growth. The results are presented in Section 5, and Section 6 concludes.

2 Background: the NIHD

Launched on 18 May 2005, the NIHD is a programme designed to fight poverty, exclusion, and precariousness, with the goal to provide the country with a high human development level in the long term (CESE 2013). The programme adopts an approach articulated in three axes. First, a political process that reinforces a modern state respectful of democracy and justice and which promotes women's and children's rights. Second, the programme enacts several reforms and projects generating and boosting economic development. Finally, the programme aims to strengthen human development in its economic, social, and cultural dimensions, with the principles of good governance being at the core of the programme (Figure A14).

The NIHD distinguishes itself from previous programmes in its approach, which relies on a bottom-up planning policy to stimulate development from below. It is a national programme that aims to be a mobilizing and unifying action framework for development actors around integrated projects with strong social impacts. This framework leverages the complementarity of the abilities and resources of the various actors, including private partners and central government. It relies on partnerships between these actors to ensure coordination and synergy between the interventions. Indeed, the projects implemented

[5] A preliminary assessment of the first phase of the NIHD programme provides suggestive evidence of a change in economic structure in beneficiary communes (ONDH 2013). For instance, non-agricultural income increases by 29 per cent in beneficiary communes while it falls by 6.7 per cent for non-beneficiary ones.

as part of the NIHD are proposed by the population based on a participatory process and formulated in multi-annual development plans, named Local Initiatives for Human Development. The targeted population get involved in the implementation and monitoring/evaluation of projects through the participation of multiple local partners. Local authorities (municipalities), cooperatives, the beneficiaries themselves, and other private partners[6] are notably involved in the management of the diverse projects.[7] While the government still manages the majority of the funding of the programme (57.5 per cent), a sizeable part is managed by associations (25.5 per cent) and Communes (16.7 per cent) (Figure A15(a)). Private partners also contribute to the funding—up to 30.5 per cent of the total funding of phase I (ONDH 2012). The contribution of private partners is particularly significant in Casablanca-Settat region (Figure A15(b)).

The programme has been rolled out in three phases nationwide (Figure A16). The first phase of the NIHD (2005–10), which is of particular relevance to this study, comprised four components that specifically targeted various social categories (Figure A17(a)). Two components are labelled the Fight Against Poverty in Rural Areas Programme and the Fight Against Social Exclusion in Urban Areas Programme. These two components target poor and vulnerable people and represent around 48 per cent of the funding over 2005–10. They typically encompass actions and projects relating to income-generating activities as well as supporting access to social services, infrastructure, basic health and education services, etc. A third component, labelled Anti-precariousness (21.2 per cent of the funding over 2005–10), aims to improve precarious people's standard of living and to support people in difficult situations such as homeless youth and street children, destitute elderly people, etc. The actions and projects of this programme relate more to the support for family and social reintegration, support for socioeconomic integration (training in basic trades, support of a professional integration person), services specific to the different categories in the appropriate reception centres (accommodation, care protocol, etc.), and capacity building of associations (management and the support for the operation of the centre). Finally, this phase includes a component called the Transversal Programme, which benefits from the highest share of funding (30.6 per cent) on the basis of calls for high-impact projects for human development. It concerns municipalities nationwide that are not targeted by the three previous programmes. The intervention areas of the Transversal Programme include sociocultural and sport activities, support for projects (advice, guidance, and supervision), income-generating activities, and capacity building and good governance of local actors.[8]

3 The METD: content, measures, and consistency

To address the objective of this paper, we mainly rely on the METD, which is framed as a subnational-level extension of the GGDC/UNU-WIDER ETD (Kruse et al. 2023). Our METD dataset is built using relevant information from sources of official institutions (reports, websites) while paying attention to the coverage and consistency of concepts and definitions. These institutions are mainly the Ministry of Economy and Finance[9] (MEF) and the High Commission of planning[10] (HCP), which is the national institute of statistics. Table 1 presents the content of the METD, including the variables of interest and their descriptions. Each variable is measured at the regional level over the period 2001–18.

[6] Such as associations, NGOs, private operators.

[7] https://www.diplomatie.ma/fr/initiative-nationale-de-dÃl'veloppement-humain.

[8] https://indh-ainsebaa.gov.ma/wp-content/uploads/2018/02/Note-dorientations-Fr-2011-2015-1.pdf.

[9] Ministère de l'économie et des finances.

[10] Le Haut-commissariat au Plan.

Table 1: Content of the METD

Variables	Description	Time period
Value added (VA)	Gross value added at constant (2015) prices in local currency aggregated in three broad sectors: – Agriculture (ISIC sections A, B) – Industry (ISIC sections C, D, E, F) – Services (ISIC sections G, H, I, J–P)	2001–18 (annual data)
Persons employed	– All persons aged 15 years old and over and engaged in the production of goods and services during a specified short reference period and all persons normally employed but absent from work due to a temporary impediment – They are grouped into three broad sectors similarly to the VA	
Labour force	All persons aged 15 year old and over who participate in the labour market	
Working-age population	All persons aged 15 years old and over	
Total population	Population living in each region	

Source: authors' elaborations

3.1 Value added and employment

We construct the VA and employment series in the METD by primarily exploiting the information available in MEF documents (reports and websites) for two reasons. First, the MEF sources have the advantage, over the HCP ones, of being consistent regarding both the System of National Accounts (SNA) change in 2011 and the regional administrative division reform (hereafter regional reform) in 2014. Second, the MEF provides yearly sectoral data for 2001–16. The HCP data includes sectoral VA only in 2004 and 2007, and yearly for 2009–18 without harmonizing the regional administrative division. Before 2013 the regional data follow the pre-reform 16-regions division.

The MEF data have some disadvantages that we handle by exploiting information available in the HCP data while preserving consistency with the ETD (Table 2). For instance, we extend the MEF VA data set up to 2018 following de Vries et al. (2021). The MEF VA data are forward-interpolated from the 2016 levels as a benchmark using sectoral VA trends provided by HCP statistical yearbooks. For the MEF sectoral VA, being originally in current prices, we get the sectoral VA in 2015 constant prices by taking advantage of the ETD.[11] The ETD includes sectoral VA at the national level in both current and constant 2015 prices, which we use to compute three deflators at the national level over the period 2001-–18, corresponding to the three broad sectors classification: agriculture, industry, and services (Tables A1 and A5). While these deflators ensure the comparability of the METD with the ETD, spatial differences in the prices by region are not accounted for.

Table 2: Data sources exploited for collecting the sectoral VA

Period	Sources
2004, 2007, 2009–18	Statistical yearbooks from HCP
2001–16	MEF database
2017, 2018	Authors' calculations using forward interpolations consistently with de Vries et al.'s (2021) approach.

Source: authors' elaborations

The METD mostly builds on the MEF employment data at hand, which covers the period 2001–12 (Table 3). However, the MEF employment includes child labour, namely workers younger than 15 years, which is different from the ETD definition. We subtract from the MEF sectoral employment the share of child labour in each sector based on national-level estimates provided in the HCP annual statistical yearbooks (Table A6). The ideal would be to use the sectoral child labour shares at the regional level. Given

[11] The ETD provides sectoral VA and employment data for 51 countries from 1990 to 2018, distinguishing 12 sectors of the economy following ISIC revision 4.

the data constraints, we assume that the national structure of child labour remains the same within the regions.

Table 3: Data sources exploited for collecting the sectoral employment

Period	Sectoral employment data sources
1999–2013	Employment report from HCP
2001–12	MEF database
2013–14	Authors' calculations using interpolation method
2015–18	– Regional statistical yearbook
	– Authors' calculations using the interpolation method

Source: authors' elaborations.

We complete the employment data up to 2018 based on the statistical yearbooks at the regional level provided by the HCP (Table 3). Employment figures are not systematically reported in the yearbooks for some regions and years. Table A2 reports in column 1 the data we were able to collect for each region from the available sources (MEF and HCP yearbooks). Except for the years 2013 and 2014 we were able to collect 66–85 per cent of the employment data over the period 2015–18, depending on the sector and the year (Table A3). Regarding the years when the employment statistics are unavailable, we use imputation methods while preserving the comparability with the ETD database. We keep in mind that the employment data are mostly driven by collected data (more than 81 per cent collected data; Table A3). Specifically, we proceed in two ways to fill in the data, depending on the data at hand to reasonably impute the missing values. First, we use the interpolation method for non-agricultural sectors similarly to de Vries et al. (2021), who use the same procedure to fill in gap years. More specifically, this approach is based on the average trends in labour productivity between two benchmark years to estimate the employment at time t (EMP^t) as follows:

$$EMP_r^t = \frac{VA_r^t}{LP_r^{t-1}} / \exp\left[\frac{\log\left(\frac{LP_r^{b2}}{LP_r^{b1}}\right)}{b2-b1}\right], \text{ with } b_1 < t < b_2 \quad (1)$$

where EMP_r^t represents the employment estimates in region r at time t, VA_r^t is the VA in 2015 constant prices, $LP_r^t = \frac{VA_r^t}{EMP_r^t}$ is the labour productivity, b_1 and b_2 denote the first and second benchmark years. $\exp(.)$ is the exponential function, and $\log(.)$ is the logarithm function.

Second, we use the yearly average growth rate for agricultural employment between the benchmark years instead of Equation (1). Indeed, Equation (1) assumes harmonized movements between the VA and employment. As a result, we ended up with estimates of agricultural employment that are quite volatile as a result of the agricultural production depending on weather conditions in Morocco. Hence, our estimates of agricultural employment are likely to be smoother than if we followed de Vries et al. (2021).

3.2 Total population, working-age population, and labour force

We mostly exploit HCP sources to construct the labour force and population-related variables (Table 4). Population figures over the period 2001–18 are available in the annual statistical yearbooks provided by the HCP. As the population statistics by province are available over the period 2001–13, we aggregate them according to the post-reform region division. Then, we complete the regional data for the period 2014–18 that are consistent with the current administrative division. We exploit mainly the same source to build the working-age population and labour force series. However, statistics at the province level are not provided for both variables so we were unable to construct harmonized series consistent in terms of administrative division.

Table 4: Data sources exploited for collecting regional figures on labour force and population-related variables

Period	Variable	Sectoral data source
2001–18	Population	Annual statistical yearbooks from HCP
2001–14, 2017–18	Working-age population	Annual statistical yearbooks from HCP
2015–16	Working-age population	– Regional statistical yearbooks – Authors' calculations using growth rates
2001–13	Labour force	MEF database
2014–18	Labour force	Calculated using labour force rates provided by the annual statistical yearbooks of the HCP

Source: authors' elaborations

We encounter additional challenges that we handle by using complementary information such as the MEF database or regional statistical yearbooks (Table 4). First, regional working-age population statistics are missing in the annual statistical yearbooks for 2015. We were able to collect roughly 63 per cent of the working-age population in 2015 from the HCP regional statistical yearbooks (Table A4). For the missing 37 per cent we use the average yearly growth rate by region between 2014 and 2016 to estimate the working-age population in 2015. Second, we collect the labour force from the MEF database that provides yearly data for 2001–13 following the 16 administrative divisions. We extend our series to 2018 using regional labour force rates from the HCP statistical yearbooks and the regional working-age population data collected previously. Hence, the labour force data is inconsistent for the administrative division because the extension of the series from 2014 to 2018 is based on the 12 regional administrative divisions. More specifically, we apply the following formula to estimate the labour force over the period 2014–18:

$$Labour\ force_r^t = working-age\ population_r^t \times labour\ force\ rates_r^t \quad (2)$$

where r denotes the region and t the year.

3.3 Consistency: external and internal validity

Consistency issues may arise given the different sources used to build the METD and the assumptions made to handle data challenges. We further proceed to some validity checks at two levels to ensure the quality of the METD. First, we analyse to what extent the sectoral dataset we build is comparable with the ETD national aggregates. Second, we conduct a thorough discussion of the regional VA measure according to the two sources of information—the MEF and the HCP—to account for their differences in the analysis.

External validity: consistency of METD and ETD aggregates

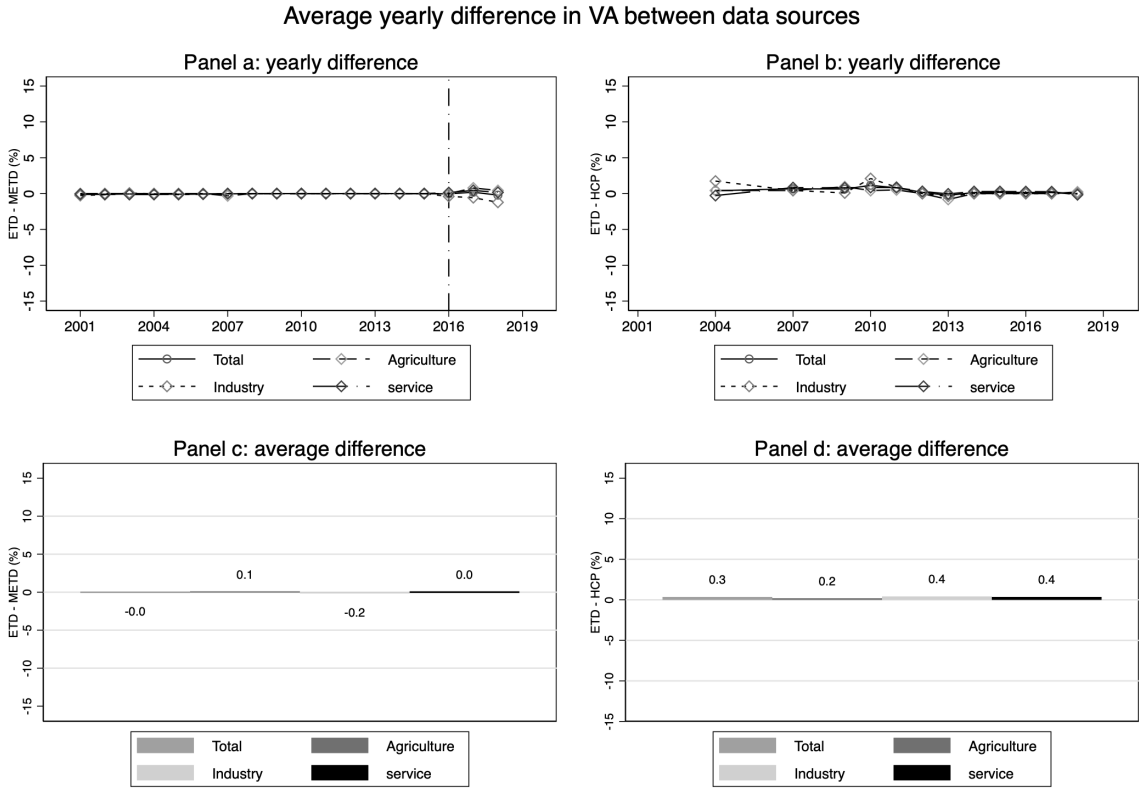
Overall, the METD VA seem consistent with the ETD VA at the economy-wide level (Figure A9). The consistency is confirmed in Figure 1, which shows the difference in percentage between the ETD, on one hand, and both HCP and METD VAs, on the other. The differences in the aggregates between the METD and HCP are insignificant, especially before 2016 (Figure 1(a,b)). We observe, however, some discrepancies between the METD VA and the ETD VA in 2017 and 2018. This period corresponds to the years the data are interpolated using regional yearly growth rate from the HCP VA. Yet the gap between our estimates and the EDT VA remains almost null in average over the period (Figure 1(c,d))

The convergence of the ETD and both METD and HCP VA series at the economy-wide level is expected considering that we exploit the same primary data sources as the ETD, except that our database focuses on the regional level. To build the ETD, de Vries et al. (2021) exploit primarily the HCP statistical yearbooks that provide national VA computed from the regional HCP VA. Regional MEF VA, which we mostly rely on, is computed based on a combination of regionalization methods[12] of the nationwide

[12] The MEF regionalization method of the VA is presented in detail in Appendix B.

HCP VA. Using a calibration-revision approach, the MEF ends up with a regional VA dataset that is calibrated with the nationwide HCP VA. As a result, the coherence between the METD VA and the ETD is unsurprising.

Figure 1: Difference in percentage of the VA between data sources



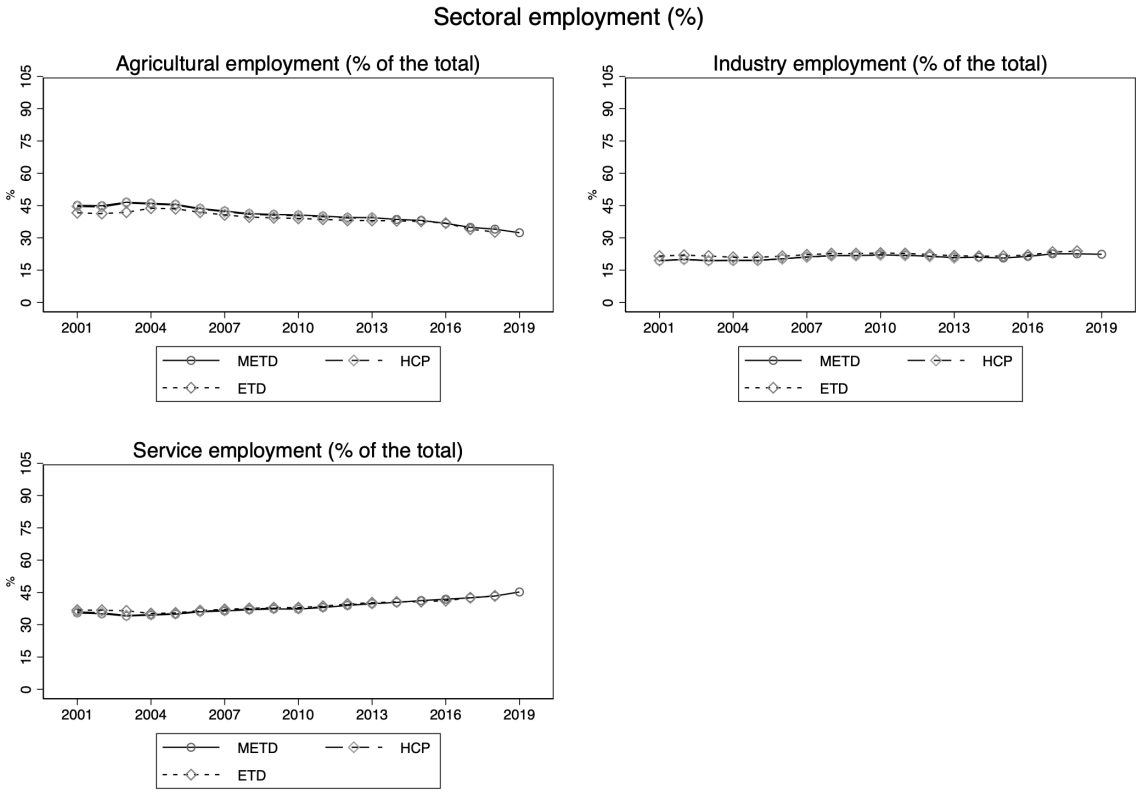
*METD: Moroccan Economic Transformation Database; HCP: Haut Commissariat au Plan; ETD: Economic Transformation Database

Source: authors' elaboration based on the METD.

Figure 2 shows that the METD employment is also consistent with the ETD employment, suggesting that the scope of the employment collected and estimated in the METD remains reasonable. The employment structure is similar according to the three sources (METD, HCP, and ETD). Yet, there are small discrepancies before 2005, especially in the agriculture and industry sectors, which is quite surprising. We expect the ETD and particularly the HCP to provide exactly the same employment statistics. Indeed, the ETD exploits the HCP statistical yearbooks to compute the employment, which is based on the National Employment Surveys. We collect the regional HCP employment statistics from the report series[13], also computed by the HCP based on the same surveys. There are no reasons that the two documents provide different employment aggregates as both of them are produced by the same institution using similar data. One may point out a difference in the concept of employment adopted in each document to explain these differences. Nonetheless, the definition presented in the methodological part of both documents is the same. In spite of the discrepancies, it is reassuring to observe the convergence between the METD and HCP employment data computed by two different institutions using the same surveys.

[13] HCP, Le rapport activité, emploi et chômage, résultats détaillés, report

Figure 2: Sectoral employment share over time



*METD: Moroccan Economic Transformation Database; HCP: Haut Commissariat au Plan; ETD: Economic Transformation Database

Source: authors' elaboration based on the METD.

Internal validity: comparison of HCP and MEF series collected in the METD

As mentioned earlier, the METD exploits the sectoral VA dataset at the regional level, computed by two institutions: the HCP and the MEF. These two series of VA are not necessarily the same as the methodologies used are different. The HCP is the official institution providing national accounts, including the regional VA that subsequently adds up to the economy-wide VA. They have access to detailed primary sources that they exploit to compute the regional VA. The main downside of the HCP regional data is that they are not necessarily harmonized over time in relation to the SNA, but in relation to the administrative division. The MEF regional VA addresses this issue as the data are consistent over time. Nonetheless, they use different approaches as they do not have access to the same data as the HCP. This approach consists of decomposing the economy-wide HCP VA by region. A combination of decomposition methods is used according to the sector, as presented in detail in Appendix B.

While both METD and HCP regional VA converge at the economy-wide level, as highlighted previously, the difference in the methodology between MEF and HCP gives rise to a concern in terms of comparability at the regional level. We compare the contributions of regions to the economy-wide VA between these two institutions over 2014–16[14] (Figure A6). Gaps between the two series reveal discrepancies in a couple of regions that are worth mentioning. The most striking gap is observed in Casablanca-Settat and, to a lesser extent, in Marrakech-Safi. The MEF data underestimate the contribution of Casablanca-Settat by roughly 5 pp yearly on average, relatively to the HCP data. In contrast, the MEF data overestimate the contribution of Marrakech-Safi in the nationwide VA by around 2 pp. The two sources provide roughly the same contribution regarding the other regions.

[14] MEF and HCP provide VA data that are consistent with the administrative divisions over this period.

Comparing the VA structure between the two data sources provides some insights regarding the origin of these discrepancies (Figure A11). In 2014 it appears that the MEF data tends to underestimate the service sector VA in Casablanca-Settat (42.9 per cent by the MEF against 54.9 per cent by the HCP) and conversely overestimate that sector in Marrakech-Safi (62.9 per cent by the MEF against 56.2 per cent by the HCP). The MEF regionalization method may explain part of these discrepancies as it relies on some assumptions, such as economy-wide productivity labour in the service sector being constant across regions. For instance, based on that assumption, the national VA in service (excluding hotels and restaurants) is distributed at the regional level using regional service employment share. As a result, estimates of the VA may be downward (upward) biased in the regions where the labour productivity is above (below) the nationwide average. This explanation seems plausible as the service labour productivity in Casablanca-Settat (Marrakech-Safi) is above (below) the nationwide labour productivity (Table 5).

Table 5: Employment and VA, labour productivity in the service sector in 2014

Regions	Service employment (millions)	Service VA (billion DH)	Labour productivity (DH per worker)
Casablanca-Settat	1.0613	157.351	148 252.02
Marrakech-Safi	0.5065	47.354	93 492.56
Nationwide	4.2953	531.242	123 679.151

Source: authors' elaboration. Employment figures are authors' estimations based on the 2014 census. VA is from the HCP national accounts.

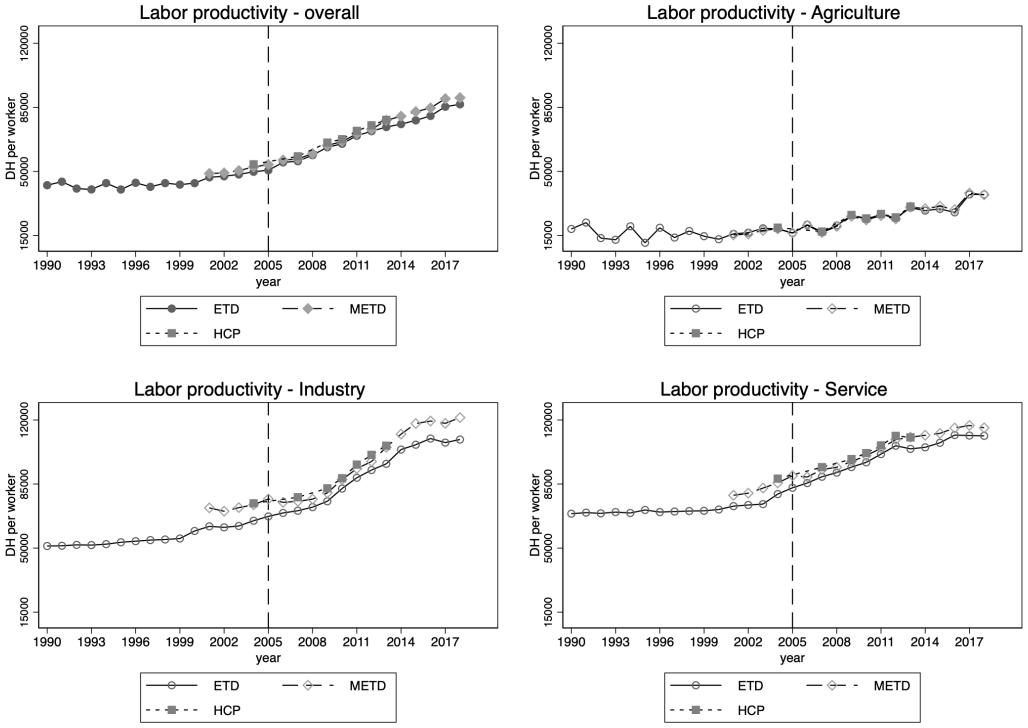
While keeping these discrepancies in mind, the regional MEF VA data are still reasonably relevant to the analysis of structural change. Indeed, both series rank similarly the regions regarding their contributions to the economy-wide VA (Figure A6). As expected, MEF and HCP data show that Casablanca-Settat and Rabat-Salé-Kénitra regions, which are respectively the economic and political capitals, contribute the most to the VA. Furthermore, both MEF and HCP series evolve in the same direction, with the gap between them remaining roughly constant over time (Figure A11). Therefore, we expect the results to remain unchanged as the bias is systematic over time and the analysis ultimately focuses on productivity growth. The sensitivity of the findings to this bias is discussed below.

3.4 Labour productivity: patterns and drivers

Figure 3 presents labour productivity trends in Morocco by data sources. While remaining constant between 1990 and 2000, labour productivity has steadily increased from 45,000 DH per worker in 2000 to achieve 85,000 DH per worker in 2018. In the case of Morocco this upward trend of labour productivity since the 2000s is explained by an increase in the VA (Figure A9) while overall employment remains roughly constant over the whole period (Figure A10). Non-agricultural sectors contribute the most to the rise in overall labour productivity. The contribution of the service sector is particularly striking as the productivity of that sector has grown quickly and at a constant pace since the 2000s. Over this period the industry sector has also contributed, but to a lesser extent between 2000 and 2009 than the service sector. Interestingly, the industry sector labour productivity growth has accelerated from 2009 to achieve the same level as the service sector labour productivity. The literature highlights a significant increase in the overall labour productivity of African countries since 2000, driven by productivity in the non-agricultural sectors (de Vries et al. 2015; McMillan et al. 2014; Mensah et al. 2022).

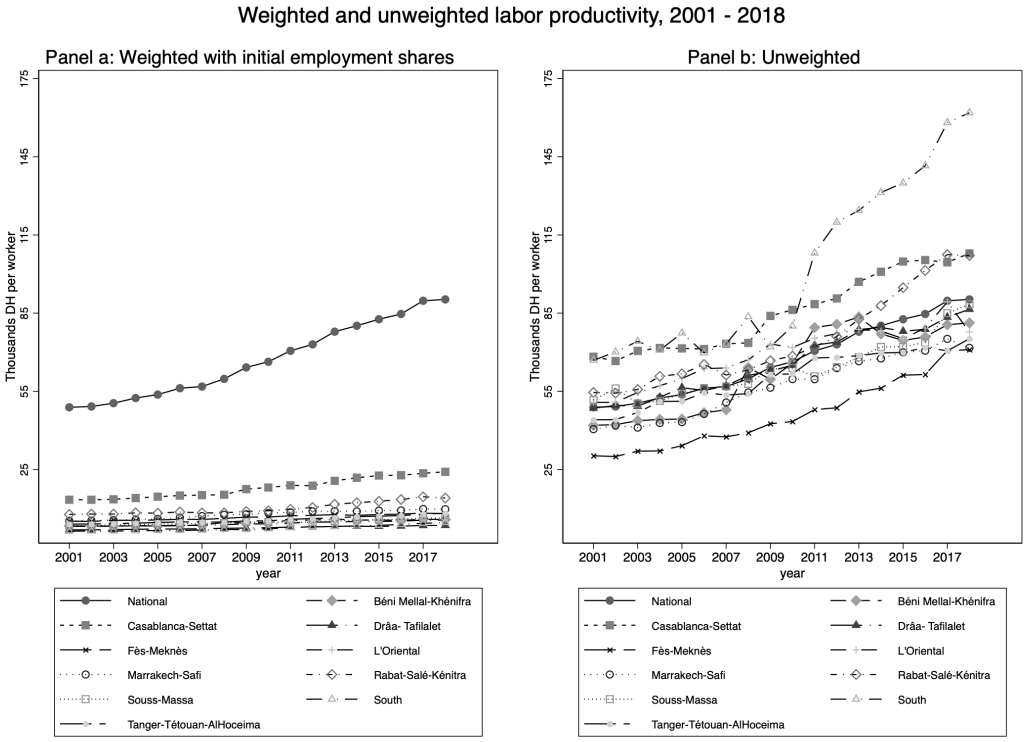
The METD enables a subnational analysis throughout the 2000s corresponding to a period of significant improvement in labour productivity, complementing the previous broad perspective (Figure 4). The regions of Morocco have heterogeneous labour productivity levels, which means different contributions to the economy-wide labour productivity. Casablanca-Settat, which includes the economic capital, is the region that contributes the most in terms of labour productivity (Figure 4(a)). Rabat-Salé-Kénitra and Marrakech-Safi follow in terms of contribution. Figure 4(b) shows also that the South seems to have high labour productivity, even outgrowing Casablanca-Settat since 2010, though with little contribution to the overall productivity figure. The region with the lowest labour productivity is Fès-Meknès.

Figure 3: Economy-wide labour productivity by data source



Source: authors' elaboration based on the METD and GGDC/UNU-WIDER ETD.

Figure 4: Labour productivity by region of Morocco



Source: authors' elaboration based on the METD.

A look into the sectoral labour productivity at the regional level sheds light on the heterogeneity in the regional dynamics of the labour productivity that differ from the national pattern in some regions (Figure A5). The labour productivity in the service sector is the highest in each region except Casablanca-Settat, as expected. Nonetheless, the difference in the dynamics of sectoral labour productivity across regions is worth highlighting. On the one hand, the gap in labour productivity between the service sector and the others remains constant or even widens over time in some regions, including Rabat-Salé-Kénitra, Fès-Meknès, and Marrakech-Safi (Figure A3). On the other hand, the industry sector labour productivity tends to catch up or even outgrows the level of productivity in the service sector in other regions. This is the case in Casablanca-Settat, where labour productivity levels for both service and industry sectors are quite similar until 2013, when the industry labour productivity becomes higher. The South, which includes Lâayoune or Dakhla, also sees their labour productivity in the industry sector increasing rapidly from 2010, to achieve the same level as the service sector in 2018.

To summarize, the growth acceleration in industry labour productivity observed since 2009 seems to be driven by the Casablanca-Settat region and to a lesser extent the South. A concern that immediately arises is whether the downward bias of MEF service VA estimates mentioned previously drives this result (see Figure A6). A triangulation of other data sources allows us to ensure the validity of the results in spite of this bias. We compute the sectoral labour productivity in Casablanca-Settat and Marrakech-Safi using HCP VA over 2014–18 (Figure A4). The results remain consistent; the industry labour productivity in Casablanca-Settat is the highest followed by the service sector, and the other way around in Marrakech-Safi. Furthermore, the significant rise in production in the manufacturing sectors in Casablanca-Settat based on HCP data corroborates the growth acceleration in industry sector labour productivity using MEF data (Figure A13).

Although industry labour productivity rises, the reallocation of employment to that sector appears quite limited (Figure A12). In most regions the employment share of the industry sector seems stable across regions over 2001–18. Hence, the increase in labour productivity is mainly driven by the VA instead of employment. In contrast, the employment share of the service sector steadily increases in many regions while it falls in the agricultural sector. The decline in agricultural employment share is particularly steep in some regions, including Marrakech-Safi, Rabat-Salé-Kénitra, and Fès-Meknès. This result suggests that there is a reallocation of labour, going from the agricultural to the service sector. Overall, the within-region dynamic of sectoral employment share follows the same patterns as the national level.

4 Methodology

In this section we outline our formal methodology for breaking down national productivity growth into its components: within and between (structural change). Our approach involves conducting this decomposition at the regional level, allowing us to examine the influence of regional productivity differences on overall productivity growth in the economy. Then we exploit the regional variation observed during the initial phase of the NIHD programme to evaluate its impact on the trajectory of productivity growth since 2005.

4.1 Measuring the structural change and within components

We begin with the Shapley decomposition framework that accounts for a broader view of structural transformation similar to Martins (2019). The starting point is to express the national output per capita as a function of labour productivity, employment rate, participation rate, and working-age population ratio

(Equation (3)).[15] Such a broad framework allows for measuring the contribution of labour productivity growth to the income per capita path relative to other demographic factors. Therefore, we intend to provide an overview of the importance of labour productivity growth in the economic development trajectory compared to changes in population structure.

$$y = w \times e \times p \times a \tag{3}$$

where y represents the national VA per capita, w is the labour productivity measured as VA per worker, e is the employment rate, p is the participation rate, and a is the working-age population ratio. We use the Shapley decomposition rule to derive the contribution of each component to the output per capita growth between two years t_1 and t_0 (Shorrocks 2013):

$$\frac{\Delta y}{y} = \bar{w} + \bar{e} + \bar{p} + \bar{a} \tag{4}$$

The marginal contribution of labour productivity $\bar{w}$ is the Shapley value specified as follows:[16]

$$\bar{w} = \frac{\Delta w}{4}[e_{t_0}p_{t_0}a_{t_0} + e_{t_1}p_{t_1}a_{t_1} + \frac{1}{3}(e_{t_1}p_{t_0}a_{t_0} + e_{t_0}p_{t_1}a_{t_0} + e_{t_0}p_{t_0}a_{t_1} + e_{t_1}p_{t_1}a_{t_0} + e_{t_1}p_{t_0}a_{t_1} + e_{t_0}p_{t_1}a_{t_1})] \tag{5}$$

Once the labour productivity growth contribution is measured, we can apply the shift-share method to measure the within and the between (structural change) components (de Vries et al. 2015; McMillan et al. 2014). As we are interested in within-country analysis, we decompose the change in VA per worker Δw, updating the shift-share method at the regional level:

$$\Delta w = \sum_r \Delta w_r^t = \sum_r \sum_i \Delta w_{r_i} s_{r_i}^{t_0} + \sum_r \sum_i \Delta s_{r_i} w_{r_i}^{t_1} \tag{6}$$

where r represents a region of Morocco, i the sector, w_{r_i} is output per capita in region r for sector i, and s_{r_i} is the ratio of sectoral employment in region r to the total. The two parts of the right-hand side of Equation (6) sum up respectively to the economy-wide within and between effects similarly to the traditional shift-share approach (de Vries et al. 2015; McMillan et al. 2014). Our decomposition is slightly different since we introduce the regional dimension, which allows us to assess the sectoral contribution at the subnational level.

4.2 Role of NIHD programme in the structural change

We further investigate the effects of the NIHD programme on labour productivity growth, focusing on the period 2001–10, for which data on NIHD funding per region is available. In practice, our baseline regression model follows a fixed effects specification:

$$\Delta w_r^t = \alpha + \beta_0 NIHD_{rt} + \gamma X_{rt} + \delta_r + \mu_t + \varepsilon_{rt} \tag{7}$$

where Δw_r^t represents the annual growth rate of labour productivity for region r at year t. Taking advantage of the amount of funding transferred to each province available during the first phase of the programme (2005–10) (ONDH 2012), we compute the share of programme funding allocated to each region, denoted $NIHD_{rt}$. Precisely, $NIHD_{rt}$ is the ratio between the amount of the NIHD funding that benefits region r over the total disbursed at year t. It takes the value 0 before the launch of the programme (i.e. 2001–04). β_0 is our parameter of interest capturing the effect of the NIHD programme on labour productivity growth. δ_r represents the region fixed effects that control for time-invariant unobservables

[15] The expression is derived from $Y/N = Y/E \times E/L \times L/A \times A/N$ where Y is the total VA, E is total employment, L is labour force, A is the working-age population, and N is the total population.

[16] Analogously, we can derive the Shapley values of the other components; see Shorrocks (2013) for more details.

that are potentially correlated with the NIHD programme. For instance, the inclusion of fixed effects allows controlling for systematic differences coming from selection criteria of beneficiary locations which are mainly based on poverty, unemployment, vulnerability (disability, homeless, elderly, street children), and lack of basic infrastructure. The eligibility criteria suggest a negative selection which implies that the baseline estimates would be downward-biased. Because these criteria were set before the launch of the programme in 2004, the region fixed effects account for this potential bias assuming that the criteria remain unchanged over the period. μ_t represents time fixed effects that allow controlling for common time-variant covariates, including inflation, that affect all regions. Additional variables, denoted X_{rt}, including rainfall shock,[17] population growth, and urbanization growth, are also considered to take into account potential confounding factors related to changes in demography, such as births, mortality, or internal migration.

Furthermore, we decompose the effects of the NIHD programme on labour productivity in terms of within and between components. The idea is to investigate whether the NIHD programme affects labour productivity through an efficient intrasectoral allocation (within) or intersectoral allocation (between or structural change). Therefore, we estimate the same specification as Equation (7), except that the dependant variables are now within and between subcomponents:

$$B_{rt} = \alpha_1 + \beta_{01} NIHD_{rt} + \gamma_1 X_{rt} + \delta_{1r} + \mu_{1t} + \varepsilon_{1rt} \tag{8}$$

$$W_{rt} = \alpha_2 + \beta_{02} NIHD_{rt} + \gamma_2 X_{rt} + \delta_{2r} + \mu_{2t} + \varepsilon_{2rt} \tag{9}$$

where $B_r^t = \sum_i \Delta s_{r_i} w_{r_i}^t$ is the between effects in region r, and $W_{rt} = \sum_i \Delta w_r^t s_{r_i}^{t-1}$ is the within effects. The linear OLS model has the advantage of allowing the disaggregation of the effect of the NIHD programme on the regional labour productivity growth into both intrasectoral and intersectoral effects. Indeed, the coefficient β_0 is the sum of the effects of the NIHD programme on between (β_{01}) and within (β_{02}) components. Given that B_{rt} and W_{rt} sum up to ω_{rt}, the error terms of Equations (8) and (9) are potentially correlated, yielding inefficient estimates in the case the system of equations is estimated separately. We also estimate the equation system using the 'seemingly unrelated regression' (SUR) method that allows for correlation between the error terms of both equations, following Zellner (1962). The results remain unchanged using the SUR method.[18]

One may be concerned about the possibility of overlooking time-varying, unobservable factors that could affect both the allocation of NIHD and productivity growth. Our variable of interest is the total NIHD funding allocated to a given region, which also varies with the contribution of local actors (associations, cooperatives, communities, etc.). Some components in the NIHD programme grant projects are based on a competitive basis (Nguyen and Rieger 2017). Hence, regions better at mobilizing complementary funding tend to receive more NIHD funding and be more productive. The sense of initiative and the project management skills of people are examples of unobserved characteristics, also correlated with productivity, that explain the total amount given to a region. Moreover, those characteristics are potentially time-varying as several associations have been created in response to the NIHD programme (Berriane 2013) and received capacity-building support, with the help of NGOs or international institutions (Bergh 2012; Bono 2010, 2013). The baseline model fails to account for such time-varying unobserved heterogeneity positively correlated with productivity growth. Hence, our baseline estimates are potentially upward-biased.

We adopt an IV strategy to address this endogeneity issue. We instrument the NIHD funding with its predetermined component, which is the share of the government in the total funding, following the literature on aid-project effects on economic performance (Andersen et al. 2022; Kraay 2012, 2014). The exclusion restriction requires the predetermined component of the NIHD funding, namely the share

[17] Rainfall shock is measured as standard deviation of rainfall from the historical average (1960–2018).

[18] Regression tables are available upon request.

financed by the government, to be uncorrelated with the unobserved region's capacity for mobilizing resources conditional on controls. We exploit the governance structure of the NIHD and the lag time between the allocation of government financial resources by the Regional Human Development Committee (CRDH) and the actual disbursement of the NIHD funds by the Provincial Human Development Committee (CPDH). Our core identifying assumption is that the allocation of government resources is uncorrelated with the subsequent contributions of local actors, which result from their capacity to mobilize complementary financial resources.

Some institutional background is helpful to better understand our argument for the plausibility of the exclusion restriction. The government financial resources are allocated to regions based on a document (ILDH) identifying the priorities for human development.[19] Resource allocation falls within the role of the CRDH, whose decisions are subject to the validation of the strategic committee. The alignment of NIHD projects with the national development strategy primarily drives this high-level institutional committee, which is chaired by the prime minister. At this stage the capacity of private partners to mobilize resources is not yet verified. Their financial contribution is accounted for subsequently at the signature of the financial convention between NIHD representatives and the projects. This signature happens during the implementation phase at the province level (CPDH) once the regional committee (CRDH) has already granted funds to each region. The lag time between resource allocation and the signature of financial conventions reinforces the plausibility of the exclusion restriction.

Another argument to consider is that decision-making regarding resource allocation is particularly centralized at a high institutional level. Nguyen and Rieger (2017) also point out the prevalence of such a top-down dimension at that level of programme governance. The strategic committee and the CRDH are mostly composed of government representatives or appointed civil servants. Their main role is to ensure NIHD projects align with the king's long-term development vision in addressing human development national priorities. Therefore, the government resources allocated to regions reflect a long-term vision that is unlikely to be correlated with local actors' unobserved characteristics.

Specifically, the IV strategy proceeds in two steps following the two-stage-least squares (2SLS) method. First, we regress the $NIHD_{rt}$ variable on the share of government funding granted to region r, denoted $GovNIHD_{rt}$, to get the predicted value $\widehat{NIHD}_{rt}$ (Equation (10)). $\widehat{NIHD}_{rt}$ captures the predetermined component of the NIHD funding, which reflects the resource allocation decisions at the CRDH level before implementation. Second, we regress the structural change between (B_{rt}) and within (W_{rt}) components on the predetermined component $\widehat{NIHD}_{rt}$ to estimate the coefficients $\tilde{\beta}_{01}$ and $\tilde{\beta}_{02}$, capturing the impact of the NIHD programme (Equations (11) and (12)). The amount is allocated conditionally to eligible areas identified in 2004. The main criteria are poverty, human development, and lack of basic infrastructure. To ensure that identification comes from variations in the government allocation choices, we control for the NIHD selection to priority areas and time fixed effects to rule out trend-correlated factors $\tilde{\mu_{.t}}, \mu_t$:

$$NIHD_{rt} = \alpha + \beta_0 GovNIHD_{rt} + \gamma X_{r,2004} + \mu_t + \varepsilon_{rt} \tag{10}$$

$$B_{rt} = \tilde{\alpha_1} + \tilde{\beta}_{01}\widehat{NIHD}_{rt} + \tilde{\gamma_1} X_{r,2004} + \tilde{\mu_{1t}} + \varepsilon_{rt} \tag{11}$$

$$W_{rt} = \tilde{\alpha_2} + \tilde{\beta}_{02}\widehat{NIHD}_{rt} + \tilde{\gamma_2} X_{r,2004} + \tilde{\mu_{2t}} + \varepsilon_{rt} \tag{12}$$

$X_{r,2004}$ includes the criteria for selecting eligible areas. We exploit the same 2004 poverty map as the policy-makers, including poverty and the UNDP Human Development Index, to identify the priority areas. We use the 2004 census to get the population variable. While the Human Development Index captures the demand side of basic infrastructure access (education and health), we also account for the offer side using a proxy of infrastructures available in rural areas. We measure this proxy using an index computed from a principal component analysis (PCA) based on a rural communal inventory

[19] https://indh-tangerassilah.ma/crdh/.

conducted in 2000. This index assumes that there were no significant changes in infrastructure until 2004. We run the PCA on 12 dummies indicating the availability of infrastructure in the location, such as a health centre, a primary or high school, electricity and water facilities, a pharmacy, an agricultural credit agency, etc.

One may worry about the effect of the aforementioned bias of the measure of VA on our findings, mentioned in the internal validity discussion.[20] We notice that the bias seems roughly systematic across regions over the years (Figure A18) and expect our results to remain unchanged even though this bias is ruled out. To test the sensitivity of our results regarding this concern, we run the same regressions using an adjusted VA dataset that accounts for this bias. We compute the adjusted METD VA by calibrating our METD VA with the HCP VA. The parameters of calibration are derived from a coefficient matrix[21] based on the yearly average gap in VA between the HCP and MEF in 2014, 2015, and 2016 (Figure A6).

5 Results

5.1 Productivity growth decomposition

Figure 5 presents the Shapley decomposition of the VA per capita growth in Morocco from 2001 to 2018. Labour productivity accounts for most of the VA per capita growth over the whole period. In 2005–10, for instance, the labour productivity component contribution amounts to 4.0 pp on average out of 4.3 per cent[22] of VA per capita growth (Figure 5(a)). The other components are also slightly growth-enhancing and even growth-reducing sometimes (Figure 5(b)). Demographic components positively contributed to most of the years, except for 2014. Both employment and participation components seem to negatively impact the VA per capita growth, especially in 2011–15. Martins (2019) also finds that the VA per capita growth is mainly driven by the labour productivity in Africa globally, and even in the North Africa region specifically.

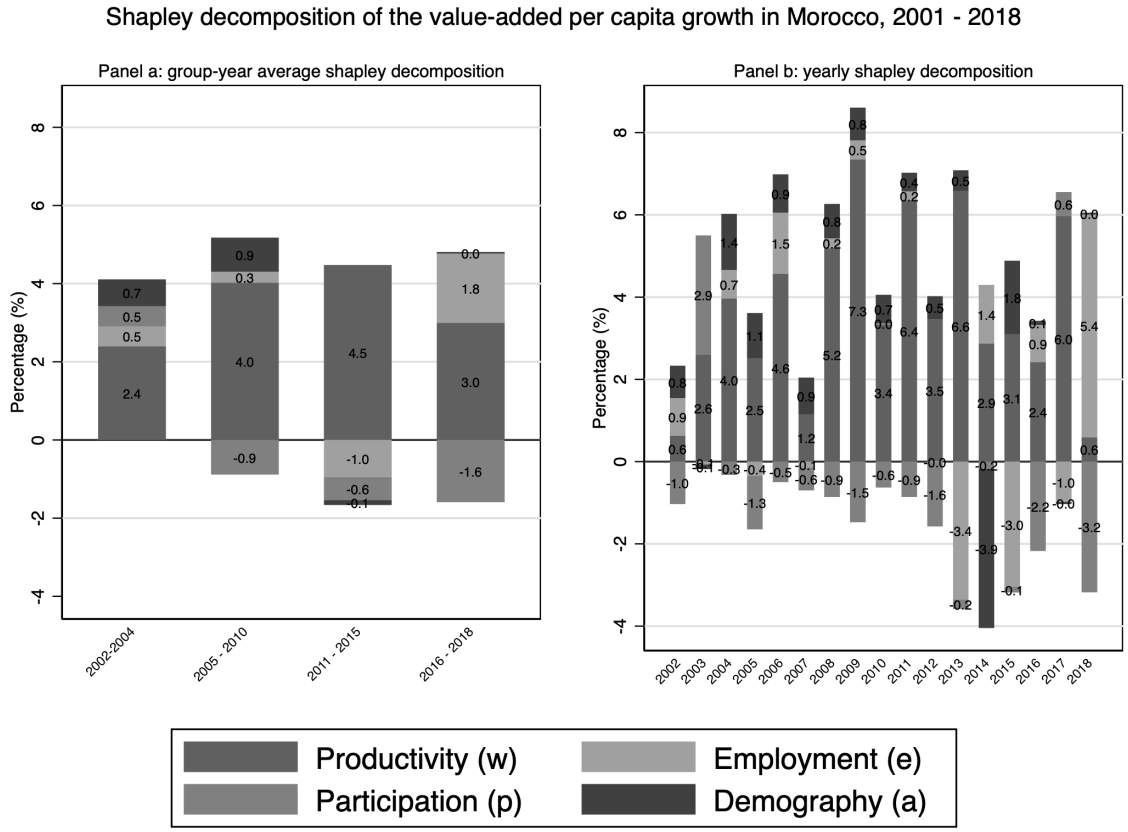
The decomposition results of labour productivity growth into within and between (structural change) components are reported in Figure 6. Structural change was growth-reducing before 2004 but became growth-enhancing since 2005. Interestingly, the structural change contribution has significantly gone up from –0.4 pp in 2002–04 to achieve 1.1 pp in 2005–10, coinciding with the launch of the NIHD programme (Figure 6(b)). The contribution of structural change is particularly considerable in 2006, 2007, 2008, 2016, and 2017 (Figure 6(d)). However, the productivity growth is mainly driven by the within subcomponent. Throughout the years we constantly find a strong contribution of the within subcomponent compared to the structural change (between) subcomponent. To gauge the robustness of our findings, we compute the same decomposition using ETD and also HCP data (left-hand side panels of Figures 6 and A7). The results remain unchanged as structural change is growth-enhancing but still contributes less than the within subcomponent.

[20] Recall the discrepancies between the MEF VA and the HCP VA as illustrated in Figure A18.

[21] The calibrating parameters for all regions are reported in Table A7.

[22] $-0.9 + 4.0 + 0.3 + 0.9 = 4.3$.

Figure 5: Shapley decomposition of the VA per capita growth in Morocco, 2001–18

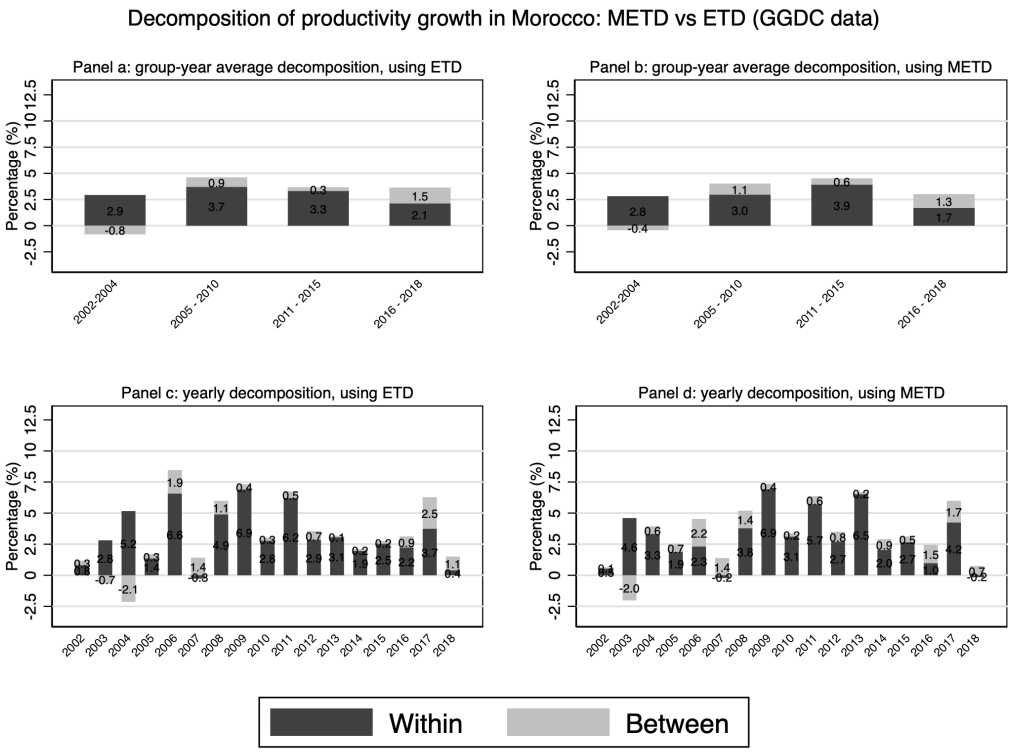


Source: authors' elaboration based on the METD.

The weak growth-enhancing effect of the between subcomponent is expected regarding the previous insights on the patterns and drivers of labour productivity. Indeed, industry and service sectors see their labour productivity increase considerably, which might explain the significant contribution of the within subcomponent. Nonetheless, the reallocation of employment to the industry sector seems quite limited. The industry sector appears to absorb little employment, while the employment share in the service sector significantly increases. Hence, the reallocation of employment from agriculture to services seems to be the key driver of the structural change subcomponent. These patterns are consistent with the literature that finds the labour productivity growth is driven by the within component, especially in Morocco and even in Africa more widely (de Vries et al. 2015; McMillan et al. 2014; Mensah et al. 2022; Moussir and Chatri 2020). The sizeable employment shift towards non-tradable services with high levels of informality may explain the low contribution of structural change to the labour productivity growth (Mensah et al. 2022).

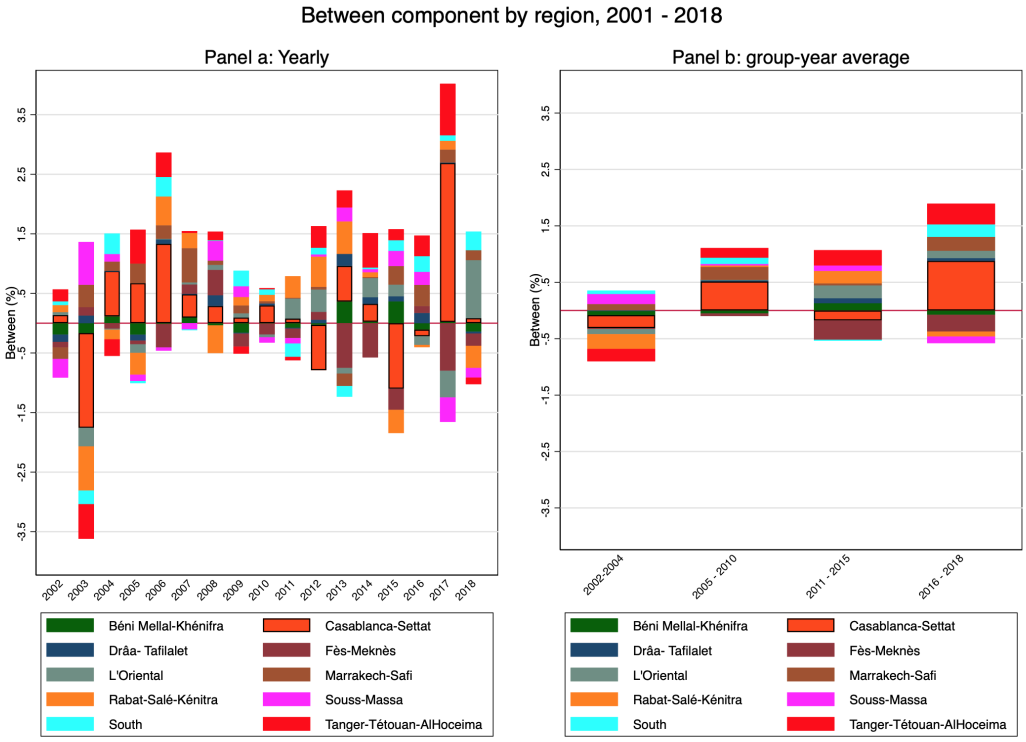
Moving beyond the nationwide perspective, the novelty of this paper is to allow a further decomposition of the labour productivity growth into within and structural change subcomponents at the regional level (Figures 7 and A8). During the periods when the structural change is significantly growth-enhancing, the strong contribution comes from Casablanca-Settat followed by Tanger-Tétouan-Alhoceima, Marrakech-Safi, and the South (Figure 7(b)). In 2005–10 and 2016–18 the growth-enhancing structural change is mainly generated from these four regions. In contrast, other regions contribute negatively to structural change. The most striking is Fès-Meknès, where the structural change appears on average growth-reducing, particularly since 2011. Regarding the within subcomponent, the contribution of Casablanca-Settat has also been strong (Figure A8). Regions with insignificant or even growth-reducing structural change generate most of the within effect. The contributions of Fès-Meknès and Rabat-Salé-Kénitra in the within effect are quite significant.

Figure 6: Decomposition of productivity growth in Morocco: METD vs ETD (GGDC data)



Source: authors' elaboration based on the METD and GGDC/UNU-WIDER ETD.

Figure 7: Contribution of the regions into the between component of the labour productivity growth



Source: authors' elaboration based on the METD.

5.2 The role of NIHD programme in the structural change in Morocco

Baseline results

We proceed further by investigating the role of the NIHD programme in the labour productivity patterns (Table 6). The results suggest that the NIHD programme positively affects the labour productivity growth rate. An increase by 10 pp of the NIHD funding share is associated with a 1.8 pp increase in the labour productivity growth (columns 1 and 2). Furthermore, the positive effects of the NIHD programme are driven by the intersectoral reallocation channel instead of the intrasectoral channel. The NIHD funding share has positive and significant effects on the structural change (columns 3 and 4). However, the effect of the NIHD programme on the within component is insignificant. Overall, the findings seem robust when adding control variables (columns 2, 4, and 6). The magnitude of the effect associated to the NIHD funding share remains unchanged after controlling for rainfall shock, and population and urban growth rates). Though insignificant, the control variables have the expected signs. A positive rainfall shock has a negative effect on structural change. The Moroccan agricultural sector being dependent on weather conditions, a positive rainfall shock might result in a good harvest campaign, which may limit employment reallocation from the agricultural sector towards non-agricultural sectors.

Table 6: The NIHD programme, labour productivity growth, structural change, and the within component

	Labour productivity growth rate (%)	Labour productivity growth rate (%)	Structural change (%)	Structural change (%)	Within (%)	Within (%)
	(1)	(2)	(3)	(4)	(5)	(6)
NIHD funding share (%)	0.018*	0.018**	0.024**	0.023**	–0.006	–0.005
	(0.008)	(0.008)	(0.008)	(0.008)	(0.012)	(0.013)
Rainfall shock		–0.025		–0.034		0.010
		(0.086)		(0.058)		(0.110)
Population growth (%)		0.940		–0.079		1.019
		(1.305)		(0.985)		(1.784)
Urban population growth (%)		–1.361		1.189		–2.550*
		(1.060)		(0.795)		(1.288)
Region fixed effects	Yes	Yes	Yes	Yes	Yes	Yes
Year fixed effects	Yes	Yes	Yes	Yes	Yes	Yes
Constant	0.063	0.116	–0.035	–0.069	0.097	0.185
	(0.088)	(0.138)	(0.071)	(0.074)	(0.102)	(0.138)
Observations	90	90	90	90	90	90
R^2	0.186	0.188	0.195	0.202	0.148	0.154
Economy-wide average						
2001–04		1.8		–0.4		2.2
2005–10		4.0		1.0		3.0

Note: robust standard errors in parentheses; * $p < 0.1$, ** $p < 0.05$, *** $p < 0.01$.

Source: authors' calculations.

To dig deeper into the mechanisms of the NIHD programme effect on structural change, we exploit the disaggregation of the programme by type of location, according to the four components of the programme, and the project manager (Tables 7 and A8). While there is no evidence of the contribution of the four programme components, the results suggest that the area of intervention and the project manager matter for the structural change. We find that the higher is the NIHD funding share allocated to urban areas, the higher is the contribution into the structural change (columns 1 and 2). These findings might be explained by the nature and the goals of the projects embedded in the different types of locations of the programme. The interventions are more diverse in urban areas relative to rural areas. In urban areas the programme funded more projects carried out by specialized centres. Those projects aim to support employability in sectors with a handcraft dimension, such as textiles and carpentry, as well as the processing of agricultural products.

Turning to the contribution of the project manager dimension, our findings show a significant contribution of associations, cooperatives, or private operators. The NIHD funding share allocated to this

Table 7: Effects of the NIHD programme on structural change: a disaggregated analysis

	(1)	(2)	(3)	(4)	(5)	(6)
NIHD funding share by type of location (% yearly total)						
Intercommunal	0.032	0.021				
	(0.202)	(0.205)				
Rural	–0.033	–0.035				
	(0.024)	(0.025)				
Urban	0.033***	0.033***				
	(0.009)	(0.009)				
NIHD funding share by programme component (% yearly total)						
Fight against exclusion in urban areas			0.200	0.185		
			(0.164)	(0.177)		
Fight against poverty in rural areas			–0.062	–0.061		
			(0.159)	(0.165)		
Fight against precariousness			0.324	0.340		
			(0.248)	(0.268)		
Transversal			–0.015	–0.021		
			(0.120)	(0.128)		
NIHD funding share by project manager (% 2005–10 total)						
Government					0.003	0.003
					(0.010)	(0.011)
Commune					–0.123*	–0.130*
					(0.055)	(0.059)
Association, cooperative, private operator					0.106***	0.106***
					(0.009)	(0.010)
Rainfall shock		Yes		Yes		Yes
Population growth (%)		Yes		Yes		Yes
Urban population growth (%)		Yes		Yes		Yes
Regions fixed effects	Yes	Yes	Yes	Yes	Yes	Yes
Year fixed effects	Yes	Yes	Yes	Yes	Yes	Yes
Constant	–0.035	–0.073	–0.035	–0.062	–0.035	-0.038
	(0.087)	(0.098)	(0.083)	(0.094)	(0.095)	(0.114)
Observations	90	90	90	90	90	90
R^2	0.229	0.237	0.201	0.209	0.247	0.256

Note: robust standard errors in parentheses, * $p < 0.1$, ** $p < 0.05$, *** $p < 0.01$. The NIHD funding share is calculated for the yearly total except for the funding share by the project manager. This latter is the total funding in as a percentage over the period 2005–10, given the data available.

Source: authors' calculations.

category of managers generates significantly more structural change. A 10 pp increase in the NIHD funding allocated to this category of manager results in a 10.6 pp contribution in the structural change component. In contrast, the effect of the funding share to the government is insignificant and becomes even more significantly negative when the manager is the commune. The funding share managed by the communes is negatively associated with the structural change, while it positively affects the within component (Table A8). This result consolidates the bottom-up approach that lets more local actors manage the projects. The management of associations contributes more to the intersectoral allocative channel while the management of communes effects positively the intrasectoral allocative channel.

IV - 2SLS results

Table 8 reports the results for the IV specification. As expected, the first-stage regression signals that the instrument is relevant. The coefficient associated with the instrument, the government funding share, and the NIHD funding share is positive and statistically significant (column 1). Moreover, the Cragg–Donald Wald F-statistic reaches a value of 117.06 larger than the rule of thumb of 10 and the Stock–Yogo critical value (16.38). Overall, the estimates obtained from the second-stage regressions closely align with our baseline results (columns 2, 3, and 4). The NIHD programme positively impacts the labour productivity growth rate. The effect of the programme on the within component is insignificant. In contrast, the point

estimate on structural change is significantly positive and remarkably close to the previous results (0.26 against 0.23). The results regarding the disaggregation of the programme by location and the project manager also remain robust to the correction for potential endogeneity (Table A9).

Table 8: Impact of the NIHD programme using the IV-2SLS method

	First-stage	Second-stage		
	NIHD funding share (%)	Labour productivity growth rate (%)	Structural change (%)	Within (%)
	(1)	(2)	(3)	(4)
Government funding share (%)	0.923***	_	_	_
	(0.112)			
NIHD funding share (%)	_	0.039*	0.026**	0.014
		(0.024)	(0.011)	(0.022)
Rainfall shock	–0.240	–0.031	–0.037	0.006
	(0.377)	(0.071)	(0.055)	(0.090)
Population growth (%)	0.137	–0.005	–0.004	–0.002
	(0.094)	(0.018)	(0.015)	(0.022)
Urban population growth (%)	–0.067	–0.020**	0.008	–0.028*
	(0.074)	(0.010)	(0.012)	(0.015)
Government selection criteria (2004)				
Poverty	Yes	Yes	Yes	Yes
Human development index	Yes	Yes	Yes	Yes
Infrastructure index	Yes	Yes	Yes	Yes
Year fixed effects	Yes	Yes	Yes	Yes
Constant	4.659*	0.323	–0.042	0.365
	(2.729)	(0.353)	(0.260)	(0.372)
Observations	90	90	90	90
R^2	_	0.246	0.255	0.168
Cragg–Donald Wald F-Stat		117.06		
Stock–Yogo critical value (10%)		16.38		

Note: robust standard errors in parentheses; * $p < 0.1$, ** $p < 0.05$, *** $p < 0.01$.

Source: authors' calculations.

Tables A10 and A11 also report the results of estimates using the METD bias-adjusted VA for robustness check. As anticipated, the estimates are robust to the adjustment VA to the MEF bias. The coefficients are roughly the same, reinforcing previous results. The robustness of the estimates about the adjustment of the VA is unsurprising because the correction of the bias would have a limited incidence on the decomposition, as illustrated in Figures A1 and A2. Despite this bias, these results support the idea that our METD VA is still relevant for the decomposition analysis. Furthermore, it validates the argument that the change in labour productivity matters most in our analysis, instead of its absolute value.

Our results contrast with Konte et al.'s (2022) findings on the effects of liberalization and privatization reforms on productivity growth. They found a significant impact of these reforms on productivity growth through the within channel instead of the structural change. The within component is the main driver of the impacts of these reforms on productivity growth, while it is the structural change channel in the case of the NIHD programme in Morocco. To explain this finding the authors point out that these reforms fail to account for barriers, such as labour market institutional rigidities, preventing workers' reallocation across sectors. In comparison, the NIHD programme addresses other factors that are not necessarily labour market institutional but are particularly relevant for labour reallocation.

Deficiencies in human capital and infrastructure are considered a major constraint for labour reallocation across sectors in developing countries, especially in Africa (Donovan and Schoellman 2021; Lee and Malin 2013; Newman et al. 2016). Projects embedded in the NIHD programme particularly intend to address these deficiencies, which may explain the significant impact of the programme on structural change, contrary to the structural reforms in Konte et al. (2022). A significant portion of the NIHD projects (25 per cent) are focused on the education, training, and health sector (ONDH 2012). Addition-

ally, several other projects involve essential infrastructure such as roads, electricity, water, and sanitation facilities.[23] The NIHD programme also helps to address financial and capital limitations faced by income-generating activities, including those outside of the agricultural sector. This support enables job creation and potentially leads to a reallocation of the workforce across sectors.

6 Concluding remarks

This paper revisits the pace and patterns of structural change in Morocco through the subnational lens. In that perspective, it introduces a new sectoral dataset (the METD) on employment and VA at the subnational level that is consistent with the so-used GGDC/UNU-WIDER ETD at the economy-wide level. Consistent with existing literature on Africa, particularly Martins (2019), the Shapley decomposition of VA per capita growth at the macro level emphasizes the significant contribution of labour productivity growth compared to other factors such as demography and employment. Since 2005 there has been a notable increase in overall labour productivity growth in Morocco, primarily driven by regions that function as economic, political, and tourist hubs, specifically Casablanca-Settat, Rabat-Salé-Kénitra, and Marrakech-Safi. A shift-share decomposition of labour productivity growth reveals episodes of growth-enhancing structural change, especially since 2005, even though the contribution of structural change is quite low in comparison to the within subcomponent. The significant contribution of the within component is generally found in the literature in Morocco and globally in the African region (Mensah et al. 2022; Moussir and Chatri 2020).

We make use of the novelty of the METD to analyse the structural change at the subnational level in Morocco in order to document the macro patterns. We document further the contribution of the regions in the economy-wide structural change. Our findings reveal that the Casablanca-Settat region contributes the most to the growth-enhancing structural change episodes, which are 2005–10 and 2016–18. It is followed by Tanger-Tétouan-Alhoceima, Marrakech-Safi, and the South. In contrast, structural change is growth-reducing in Fès-Meknès. Then, we exploit the subnational dimension of the METD to investigate whether the flagship NIHD programme affects labour productivity growth. Our findings suggest that this programme plays a significant role mainly through the structural change subcomponent.

In other words, the NIHD programme participates in efficient labour reallocation in the economy, contrary to market-based policy reforms, focusing on privatization and liberalization, affecting productivity through the intra-allocation (within) channel (Konte et al. 2022). Looking at the potential mechanisms, the effects of the NIHD programme are mainly driven by urban areas. A potential reason for this finding is the diversification of the projects regarding the sector of intervention in urban areas. A policy implication that arises from these findings is to encourage projects that contribute to the diversification of the economy. Also, our findings shed light on the key role played by local actors, such as associations or cooperatives in the management of the project. Hence, we provide valuable evidence of the contribution of such a bottom-up approach to achieving structural change.

This paper presents evidence of the effects of a human-based development strategy, which has been overlooked until now, on overall labour productivity, primarily through the structural change channel. However, it is important to acknowledge that the NIHD programme encompasses numerous projects across various sectors and intervention areas. Unfortunately, we lack detailed data to examine the heterogeneity of effects pertaining to the specific nature of these projects, which could provide valuable insights into the mechanisms of the NIHD programme. Furthermore, it is crucial to note that our analysis solely focuses on the effects of the initial phase of the NIHD programme, utilizing the available data. The subsequent two phases, which build upon and update the initial phase, warrant further investigation.

[23] http://www.indh-chefchaouen.ma/fr/secteurs-intervention/infrastructures-base.

These limitations underscore the need for future research to delve deeper into these aspects and explore potential areas for improvement.

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Appendix

A Supplemental tables and graphs

Table A1: Correspondence between METD broad sectors and HCP and ETD sector classifications

MEF sectors	HCP sectors	ETD sectors
Agriculture	Agriculture, Hunting, Related services (A00)	Agriculture (A)
	Fishing, Aquaculture (B05)	
Industry	Extraction Industry (C00)	Mining (B)
	Food and Tobacco Industry (D01)	Manufacturing (C)
	Textile and Leather Industry (D02)	Utilities (D+E)
	Chemical and Parachemical Industry (D03)	Construction (F)
	Mechanical and Metallurgical Industry (D04)	
	Other Manufacturing Industries (D05)	
	Oil Refining and Others (D23)	
	Electricity and Water (E00)	
	Construction and Public Works (F45)	
Service	Trade and repair (G00)	Trade Services (G+I)
	Hotels and Restaurants (H55)	Transport Services (H)
	Transport (I01)	Business Services (J+M+N)
	Posts and Telecommunication (I02)	Financial Services (K)
	Financial activities and insurance (J00)	Real Estate (L)
	Real estate, Rental and services Provided to Enterprises (K00)	Government services (O+P+Q)
	Public administration and security (L75)	Other Services (R+S+T+U)
	Education, Health, and Social Action (MNO)	
	Other Non-financial Services (OPO)	

Source: authors' elaborations.

Table A2: Sectoral employment data availability

Regions	Collected data (1)	Own estimates using interpolation method (2)
Tanger-Tétouan-Al Hoceima	2000–12 2015–20	2013, 2014
L'Oriental	2000–12 2015–20	2013, 2014
Fès-Meknès	2000–12 2015–20	2013, 2014
Rabat-Salé-Kénitra	2000–12 2017–20	2013, 2014, 2015, 2016
Béni Mellal-Khénifra	2000–12 2015–19 (except 2018)	2013-2014-2018
Casablanca-Settat	2000–12 2015–19 (except 2018	2013, 2014, 2018
Marrakech-Safi	2000–12 2018–19	2013, 2014, 2015, 2016, 2017
Drâa-Tafilalet	2000–12 2019	2013, 2014, 2015, 2016, 2017, 2018
Souss-Massa	2000–12 2015–19	2013, 2014
South	2000–12 2017	2013, 2014, 2015, 2016

Source: authors' elaborations.

Table A3: The share of regional employment data by sector collected

Year	Agriculture	Industry	Services
2001	100%	100%	100%
2002	100%	100%	100%
2003	100%	100%	100%
2004	100%	100%	100%
2005	100%	100%	100%
2006	100%	100%	100%
2007	100%	100%	100%
2008	100%	100%	100%
2009	100%	100%	100%
2010	100%	100%	100%
2011	100%	100%	100%
2012	100%	100%	100%
2013	0%	0%	0%
2014	0%	0%	0%
2015	66.6%	68.7%	65.5%
2016	66.7%	69.2%	65.0%
2017	79.2%	84.1%	84.7%
2018	65.7%	61.6%	62.8%
2019	97.2%	97.2%	96.5%
Total (excluding 2019)	83.9%	82.5%	81.1%
Total (including 2019)	84.4%	83.3%	82.1%

Source: authors' elaborations.

Table A4: The share of working age population data collected

Year	Share of regional data collected
2001	100%
2002	100%
2003	100%
2004	100%
2005	100%
2006	100%
2007	100%
2008	100%
2009	100%
2010	100%
2011	100%
2012	100%
2013	100%
2014	100%
2015	62.90%
2016	100%
2017	100%
2018	100%
Total	97.84%

Source: authors' elaborations.

Table A5: Annual deflators calculated using ETD

Year	Agriculture	Industry	Services
2001	0.93	0.88	0.88
2002	0.92	0.89	0.90
2003	0.86	0.95	0.91
2004	0.82	0.99	0.92
2005	0.88	0.97	0.93
2006	0.90	0.98	0.95
2007	0.96	0.96	0.99
2008	0.99	1.09	1.00
2009	0.88	0.98	1.00
2010	0.99	0.97	1.00
2011	0.96	0.99	1.00
2012	1.02	0.99	0.98
2013	0.94	1.01	0.99
2014	0.89	0.98	1.00
2015	1.00	1.00	1.00
2016	1.07	0.98	1.00
2017	0.92	0.99	1.00
2018	0.97	0.96	1.00

Source: authors' elaborations.

Table A6: Share of child labour by sector

Year	Agriculture	Industry	Services
2000	9.0%	1.7%	1.0%
2001	7.3%	1.5%	0.8%
2002	6.0%	1.4%	0.6%
2003	6.3%	1.2%	0.7%
2004	6.3%	1.0%	0.6%
2005	5.7%	1.0%	0.5%
2006	5.4%	0.7%	0.5%
2007	4.6%	0.8%	0.4%
2008	3.7%	0.7%	0.4%
2009	3.3%	0.5%	0.3%
2010	2.9%	0.4%	0.3%
2011	2.5%	0.3%	0.2%
2012	1.9%	0.2%	0.1%
2013	1.7%	0.2%	0.2%
2014	1.3%	0.3%	0.1%
2015	1.2%	0.1%	0.1%
2016	1.1%	0.1%	0.1%
2017	1.1%	0.1%	0.1%
2018	0.9%	0.1%	0.1%

Source: authors' elaborations using HCP statistical yearbooks.

Table A7: Calibration matrix to get the METD bias-adjusted VA

Regions	Agriculture	Industry	Service
Béni Mellal-Khénifra	–0.13	0.05	–0.24
Casablanca-Settat	0.17	–0.08	0.49
Drâa-Tafilalet	–0.39	–0.28	–0.36
Fès-Meknès	0.03	0.62	–0.20
L'Oriental	–0.17	0.10	–0.35
Marrakech-Safi	0.01	–0.14	–0.30
Rabat-Salé-Kénitra	0.33	0.00	0.00
Souss-Massa	–0.22	0.37	–0.09
South	–0.02	–0.49	0.31
Tanger-Tétouan-Al Hoceima	0.11	0.30	0.07

Note: the METD VA in the service is increased by 49 per cent in Casablanca-Setta to get the bias-adjusted VA that is calibrated with HCP data.

Source: authors' elaborations using HCP and METD data.

Table A8: Effects of the NIHD programme on the within subcomponent: a disaggregated analysis

	(1)	(2)	(3)	(4)	(5)	(6)
NIHD funding share by type of location (%)						
—- Intercommunal	0.495	0.512				
	(0.422)	(0.438)				
—- Rural	0.050	0.051				
	(0.036)	(0.037)				
—- Urban	–0.021	–0.020				
	(0.012)	(0.011)				
NIHD funding share by programme component (%)						
—- Fight against exclusion in urban areas			0.200	0.226		
			(0.449)	(0.475)		
—- Fight against poverty in rural areas			0.237	0.232		
			(0.318)	(0.341)		
—- Fight against precariousness			–0.356	–0.364		
			(0.419)	(0.471)		
—- Transversal			–0.165	–0.178		
			(0.655)	(0.656)		
NIHD funding share by project manager (%)						
—- Government					0.018	0.017
					(0.027)	(0.031)
—- Commune					0.195*	0.195*
					(0.092)	(0.096)
—- Association, cooperative, private operator					–0.050	–0.046
					(0.030)	(0.028)
Positive rainfall shock		Yes		Yes		Yes
Population growth (%)		Yes		Yes		Yes
Urban population growth (%)		Yes		Yes		Yes
Regions fixed effects	Yes	Yes	Yes	Yes	Yes	Yes
Year fixed effects	Yes	Yes	Yes	Yes	Yes	Yes
Constant	0.097	0.189	0.097	0.178	0.097	0.165
	(0.114)	(0.149)	(0.116)	(0.149)	(0.120)	(0.148)
Observations	90	90	90	90	90	90
R^2	0.189	0.197	0.164	0.172	0.162	0.167

Note: robust standard errors in parentheses. * $p < 0.1$, ** $p < 0.05$, *** $p < 0.01$.

Source: authors' calculations.

Table A9: Impact of the NIHD programme on structural change using IV-2SLS: a disaggregated analysis

	(1)	(2)	(3)
NIHD funding share by type of location (% yearly total)			
—— Inter-communal	0.141		
	(0.148)		
—— Rural	–0.032		
	(0.044)		
—— Urban	0.045*		
	(0.024)		
NIHD funding share by program component (% yearly total)			
—— Fight against exclusion in urban areas		0.024	
		(0.019)	
—— Fight against poverty in rural areas		–0.040	
		(0.059)	
—— Fight against precariousness		0.017	
		(0.056)	
—— Transversal		0.086	
		(0.060)	
NIHD funding share by project manager (% 2005–10 total)			
—— Government			0.004
			(0.019)
—— Commune			–0.071
			(0.083)
—— Association, cooperative, private operator			0.097**
			(0.044)
Rainfall shock	Yes	Yes	Yes
Population growth (%)	Yes	Yes	Yes
Urban population growth (%)	Yes	Yes	Yes
Government selection criteria (2004)			
Poverty	Yes	Yes	Yes
Human development index	Yes	Yes	Yes
Infrastructure index	Yes	Yes	Yes
Regions fixed effects	Yes	Yes	Yes
Year fixed effects	Yes	Yes	Yes
Constant	–0.314	–0.215	0.014
	(0.318)	(0.305)	(0.277)
Observations	90	90	90
R^2	0.267	0.261	0.309
Cragg–Donald Wald F-Stat	28.17	11.96	136.44
Stock–Yogo critical value (10%)	13.91	16.85	13.91

Note: robust standard errors in parentheses, * $p < 0.1$, ** $p < 0.05$, *** $p < 0.01$. The NIHD funding share is calculated using the yearly total except for the funding share by the project manager. This latter is the total funding as a percentage over the period 2005–10, given the data available.

Source: authors' calculations.

Table A10: Impact of the NIHD programme using IV-2SLS method: METD bias-adjusted VA

	First-stage	Second-stage		
	NIHD funding share (%)	Labour productivity growth rate (%)	Structural change (%)	Within (%)
	(1)	(2)	(3)	(4)
Government funding share (%)	0.923***	_	_	_
	(0.112)			
NIHD funding share (%)	_	0.043*	0.026**	0.017
		(0.024)	(0.012)	(0.023)
Rainfall shock	–0.240	–0.020	–0.053	0.032
	(0.377)	(0.075)	(0.056)	(0.093)
Population growth (%)	–0.137	–0.010	0.001	–0.011
	(0.094)	(0.020)	(0.016)	(0.023)
Urban population growth (%)	0.067	–0.019	0.006	–0.025
	(0.074)	(0.011)	(0.012)	(0.017)
Government selection criteria (2004)				
Poverty	Yes	Yes	Yes	Yes
Social inclusion index	Yes	Yes	Yes	Yes
Infrastructure index	Yes	Yes	Yes	Yes
Year fixed effects	Yes	Yes	Yes	Yes
Constant	4.659*	0.372	0.008	0.364
Observations	90	90	90	90
R^2	_	0.280	0.252	0.204
Cragg–Donald Wald F-Stat		116.07		
Stock–Yogo critical value (10%)		16.38		

Note: robust standard errors in parentheses, * $p < 0.1$, ** $p < 0.05$, *** $p < 0.01$.

Source: authors' calculations.

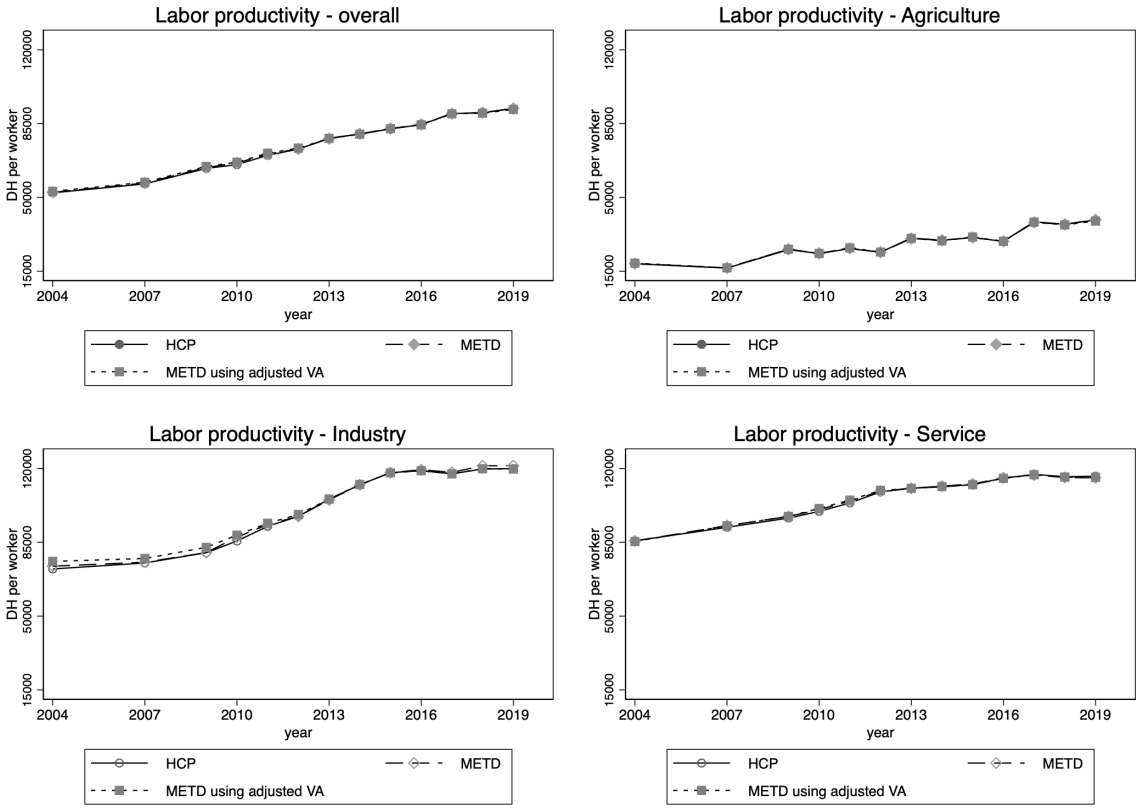
Table A11: Impact of the NIHD programme on structural change using IV-2SLS with the METD bias-adjusted VA: a disaggregated analysis

	(1)	(2)	(3)
NIHD funding share by type of location (% yearly total)			
—— Intercommunal	0.046		
	(0.140)		
—— Rural	–0.039		
	(0.051)		
—— Urban	0.050*		
	(0.028)		
NIHD funding share by programme component (% yearly total)			
—— Fight against exclusion in urban areas		0.034	
		(0.022)	
—— Fight against poverty in rural areas		–0.053	
		(0.067)	
—— Fight against precariousness		0.016	
		(0.064)	
—— Transversal		0.079	
		(0.066)	
NIHD funding share by project manager (% 2005–10 total)			
—— Government			–0.007
			(0.020)
—— Commune			–0.082
			(0.093)
—— Association, cooperative, private operator			0.117**
			(0.050)
Rainfall shock	Yes	Yes	Yes
Population growth (%)	Yes	Yes	Yes
Urban population growth (%)	Yes	Yes	Yes
Government selection criteria (2004)			
Poverty	Yes	Yes	Yes
Human development index	Yes	Yes	Yes
Infrastructure index	Yes	Yes	Yes
Regions fixed effects	Yes	Yes	Yes
Year fixed effects	Yes	Yes	Yes
Constant	–0.301	–0.254	0.111
	(0.340)	(0.323)	(0.289)
Observations	90	90	90
R^2	0.265	0.271	0.329
Cragg–Donald Wald F-Stat	28.17	11.96	136.44
Stock–Yogo critical value (10%)	13.91	16.85	13.91

Note: robust standard errors in parentheses, * $p < 0.1$, ** $p < 0.05$, *** $p < 0.01$. The NIHD funding share is calculated regarding the yearly total except for the funding share by the project manager. This latter is the total funding as a percentage over the period 2005–10, given the data available.

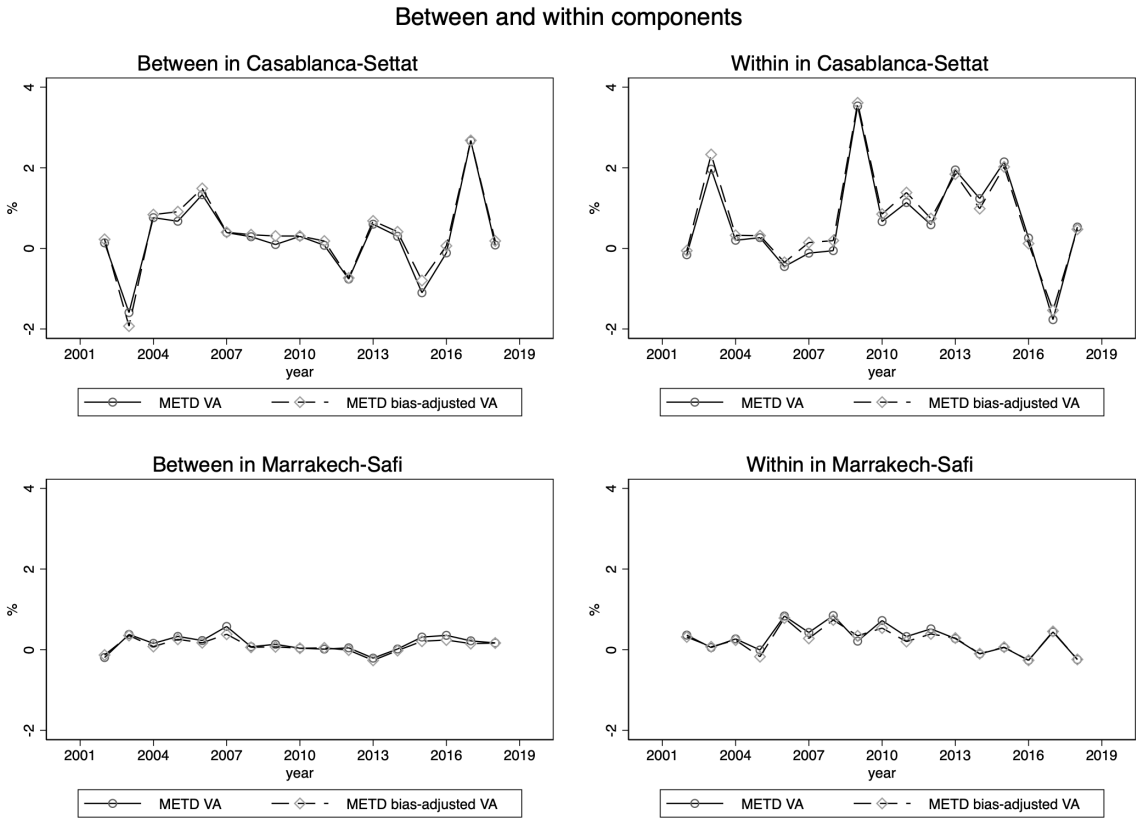
Source: authors' calculations.

Figure A1: Labour productivity using the METD adjusted VA



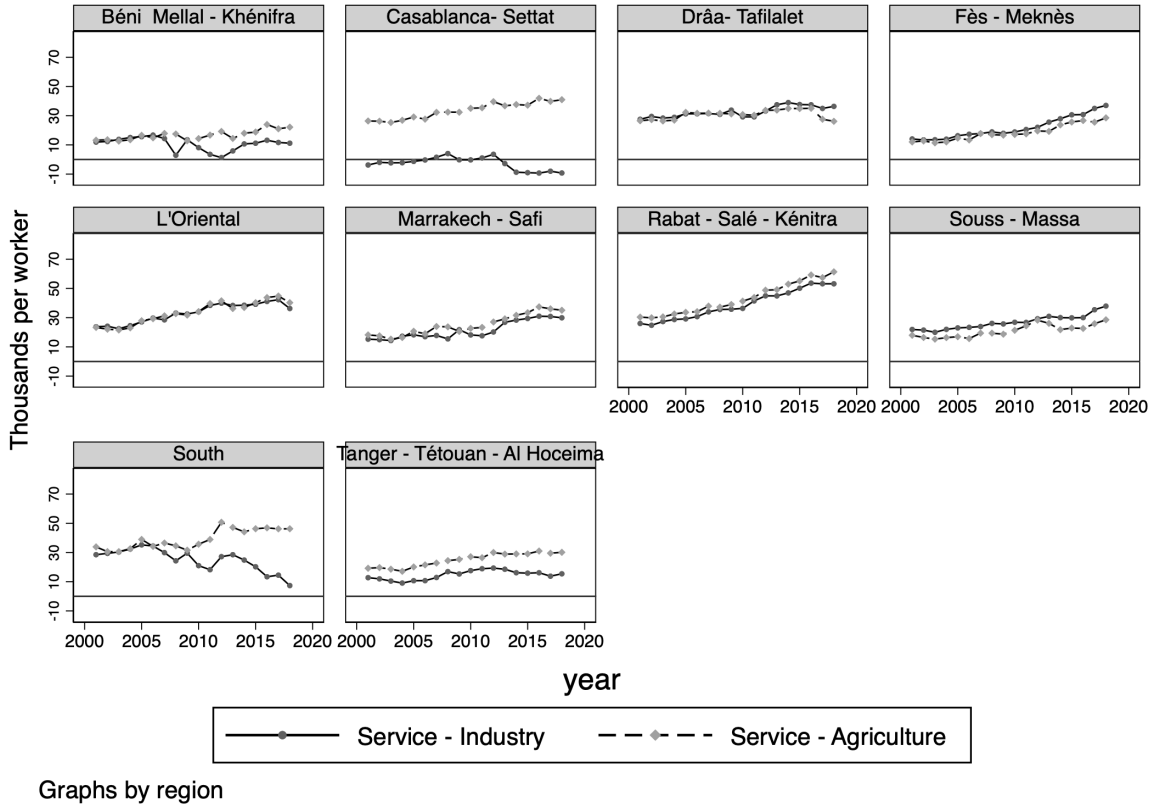
Source: authors' elaboration based on the METD.

Figure A2: Between component in Casablanca-Settat and Marrakech-Safi using the METD adjusted VA



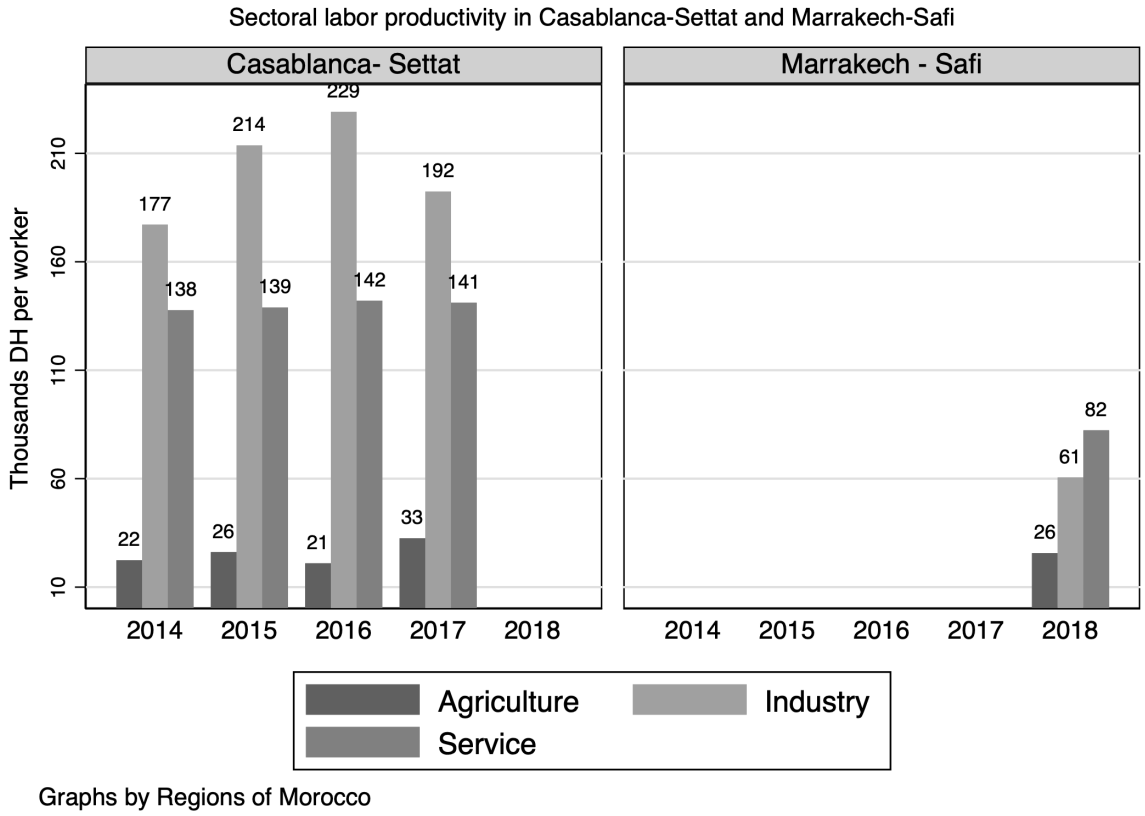
Source: authors' elaboration based on the METD.

Figure A3: Difference in labour productivity between the sectors



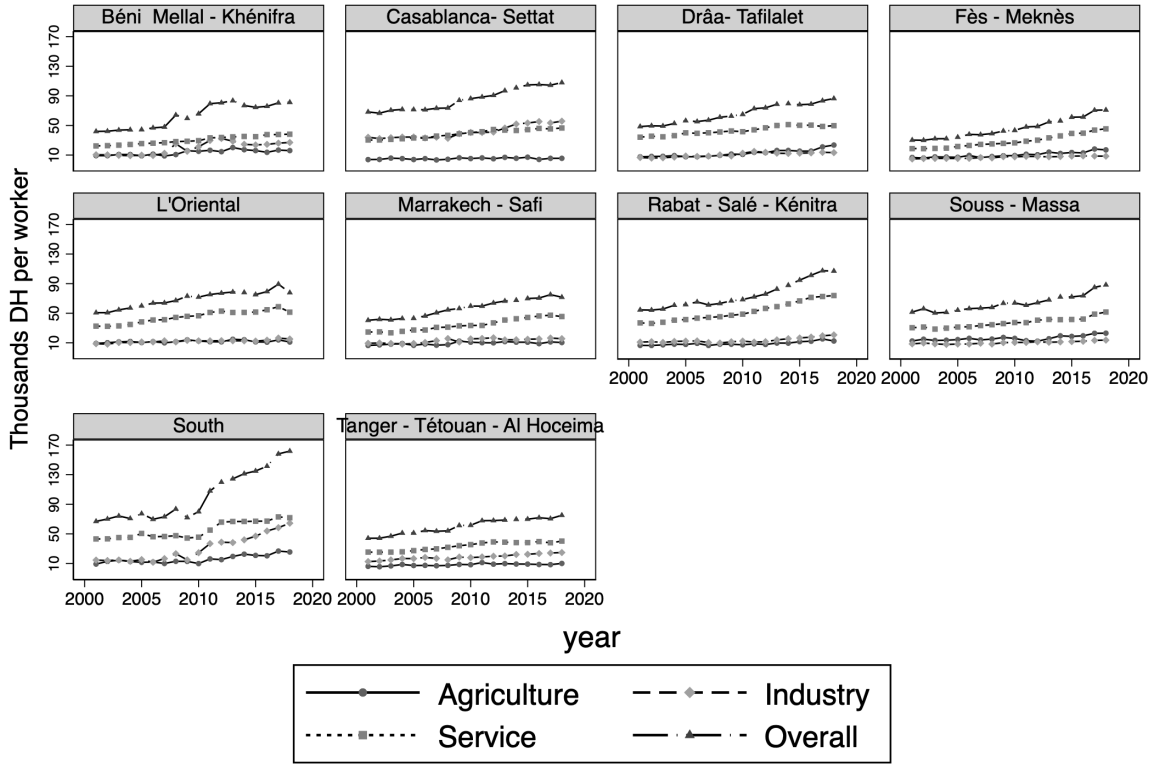
Source: authors' elaboration based on the METD.

Figure A4: Sectoral labour productivity using exclusively HCP data



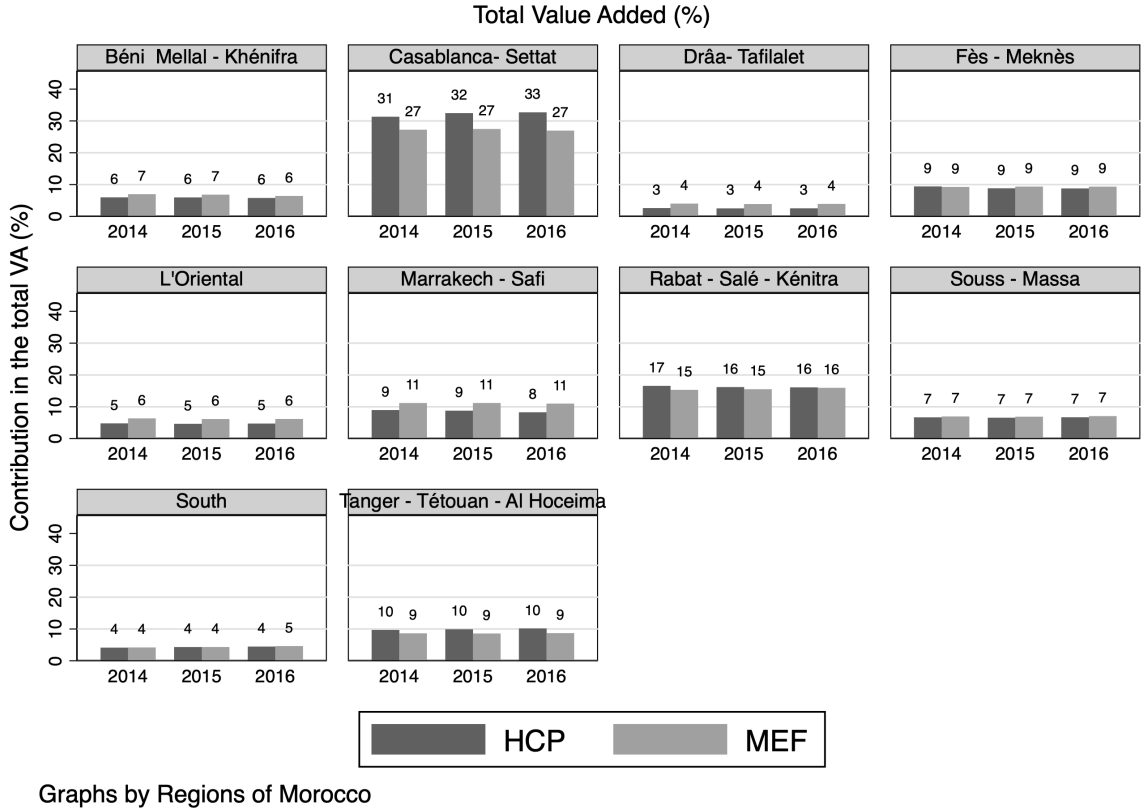
Source: authors' elaboration based on the METD.

Figure A5: Sectoral labour productivity by region: weighted using initial within-region sectoral employment shares



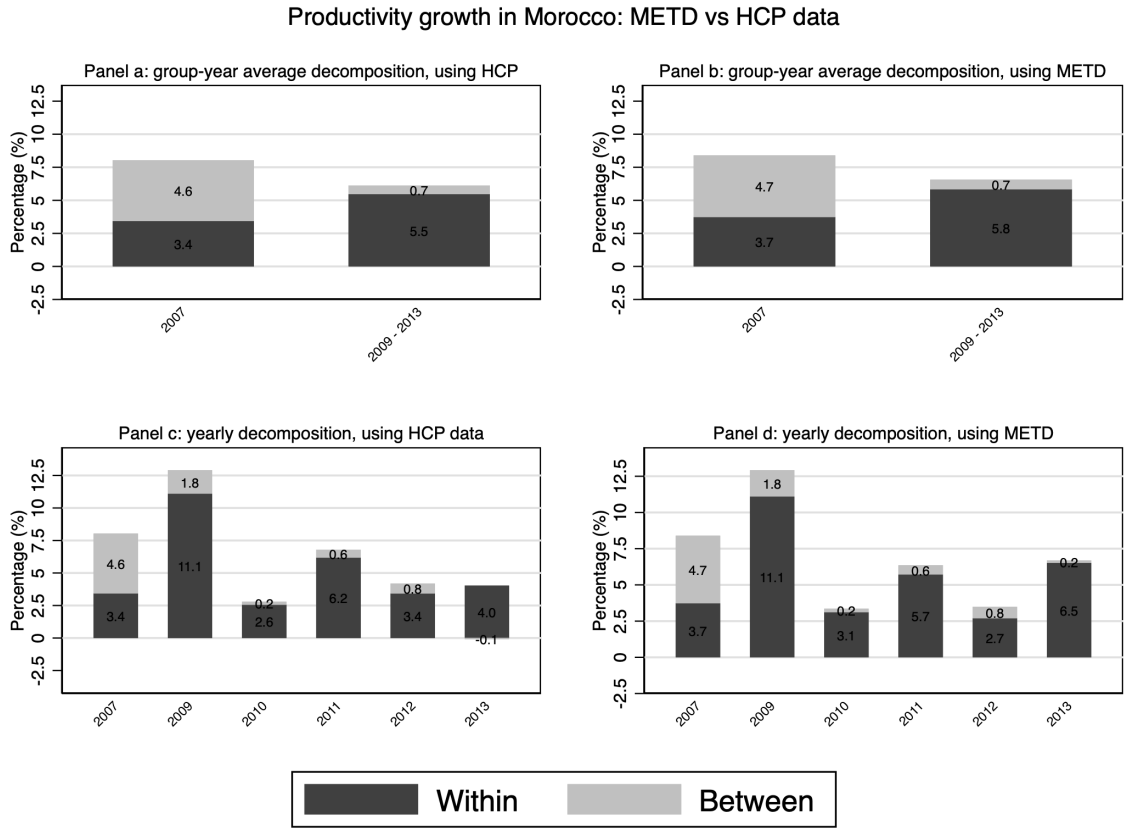
Source: authors' elaboration based on the METD.

Figure A6: Regional contribution in the economy-wide VA (%)



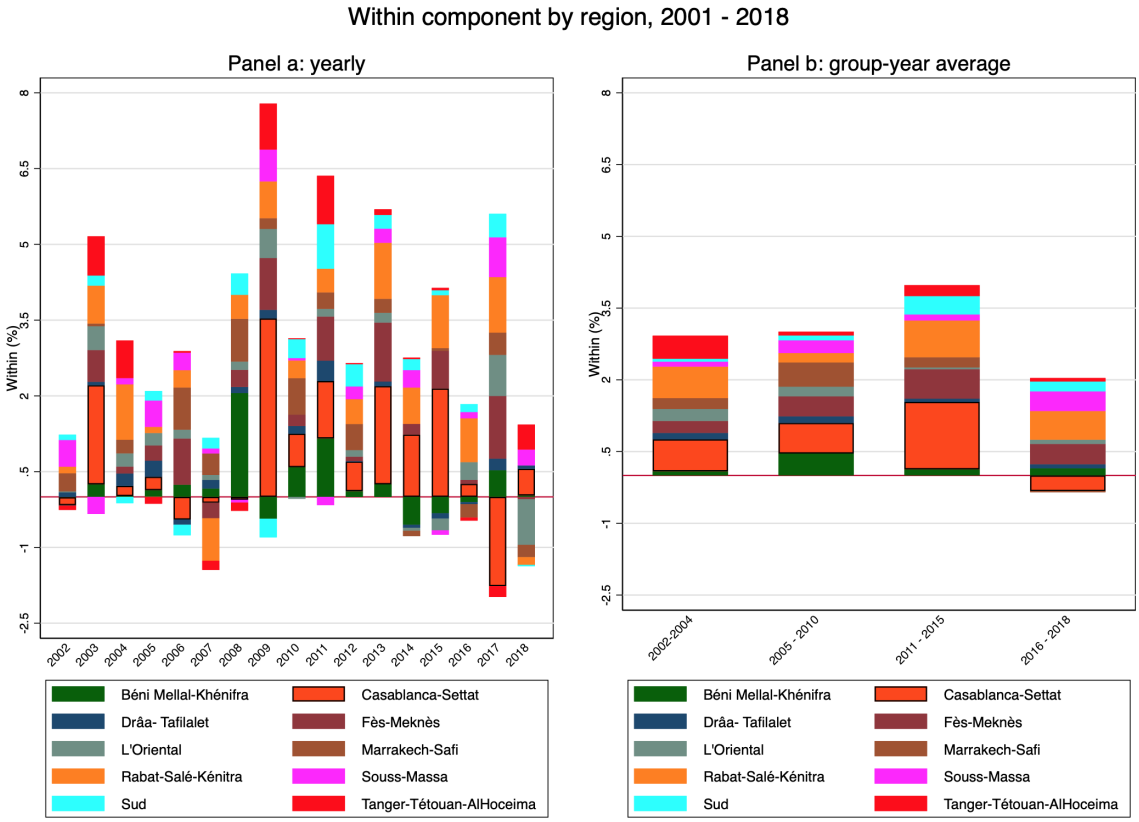
Source: authors' elaboration based on the METD.

Figure A7: Decomposition of productivity growth in Morocco: METD vs HCP data



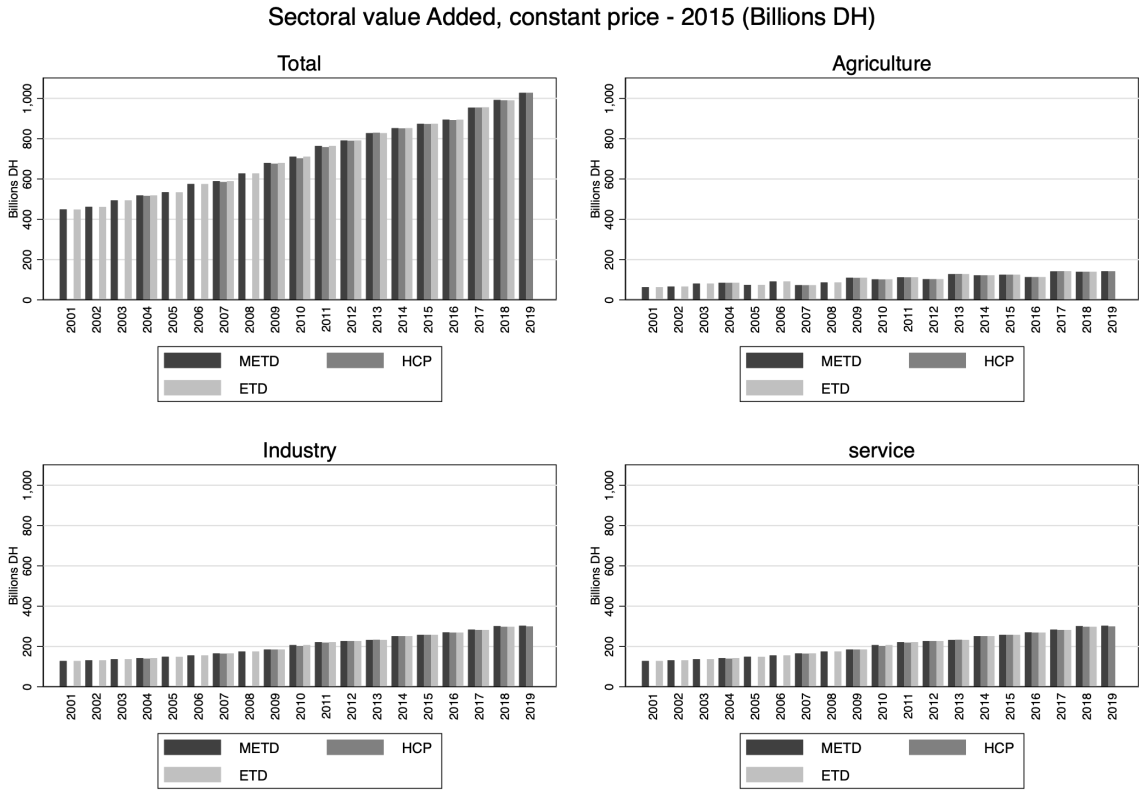
Source: authors' elaboration based on the METD and HCP documents.

Figure A8: Contribution of the regions into the within component of the labour productivity growth



Source: authors' elaboration based on the METD.

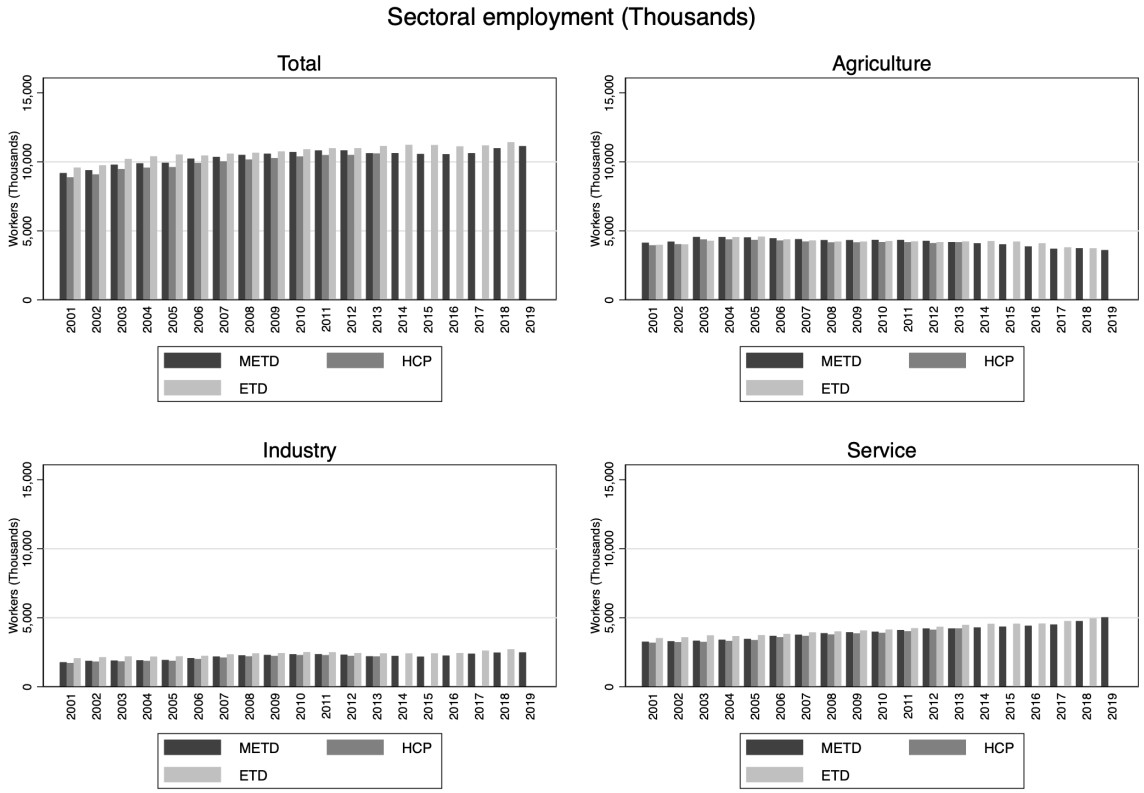
Figure A9: Economy-wide VA, 2001–18



*METD: Moroccan Economic Transformation Database; HCP: Haut Commissariat au Plan; ETD: Economic Transformation Database

Source: authors' elaboration based on the METD and GGDC/UNU-WIDER ETD.

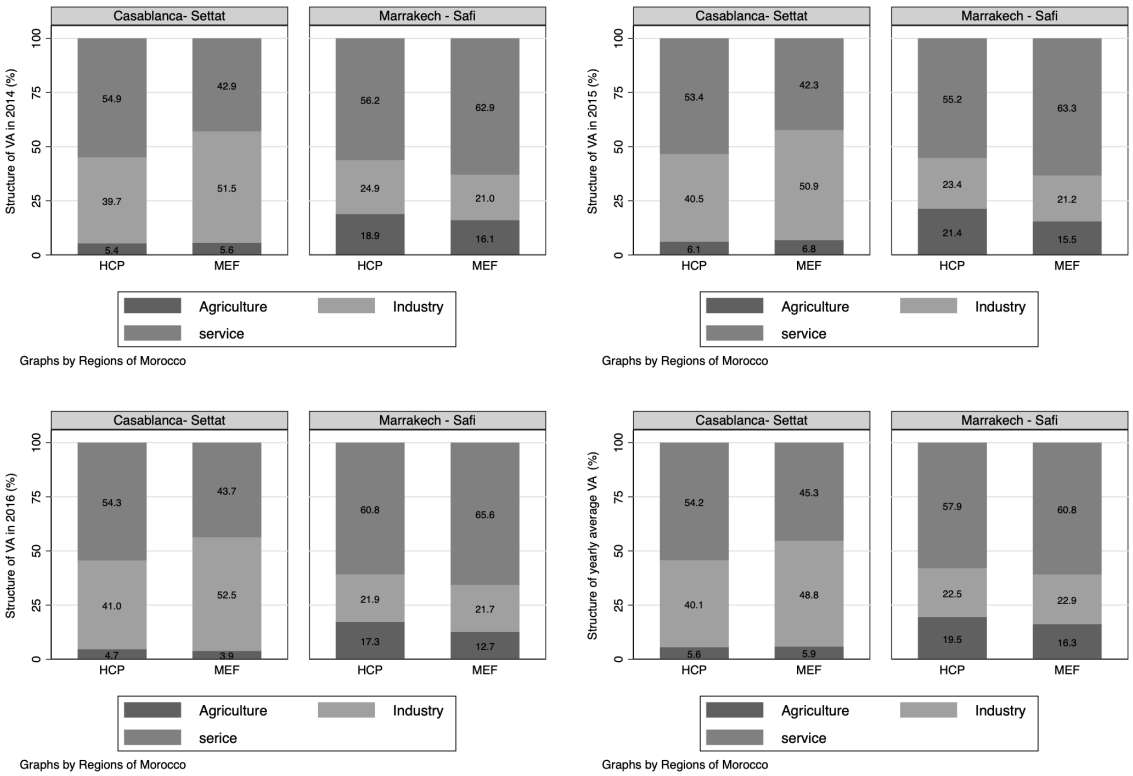
Figure A10: Economy-wide employment, 2001–18



*METD: Moroccan Economic Transformation Database; HCP: Haut Commissariat au Plan; GGDC: Groningen Growth and Development Centre

Source: authors' elaboration based on the METD and GGDC/UNU-WIDER ETD.

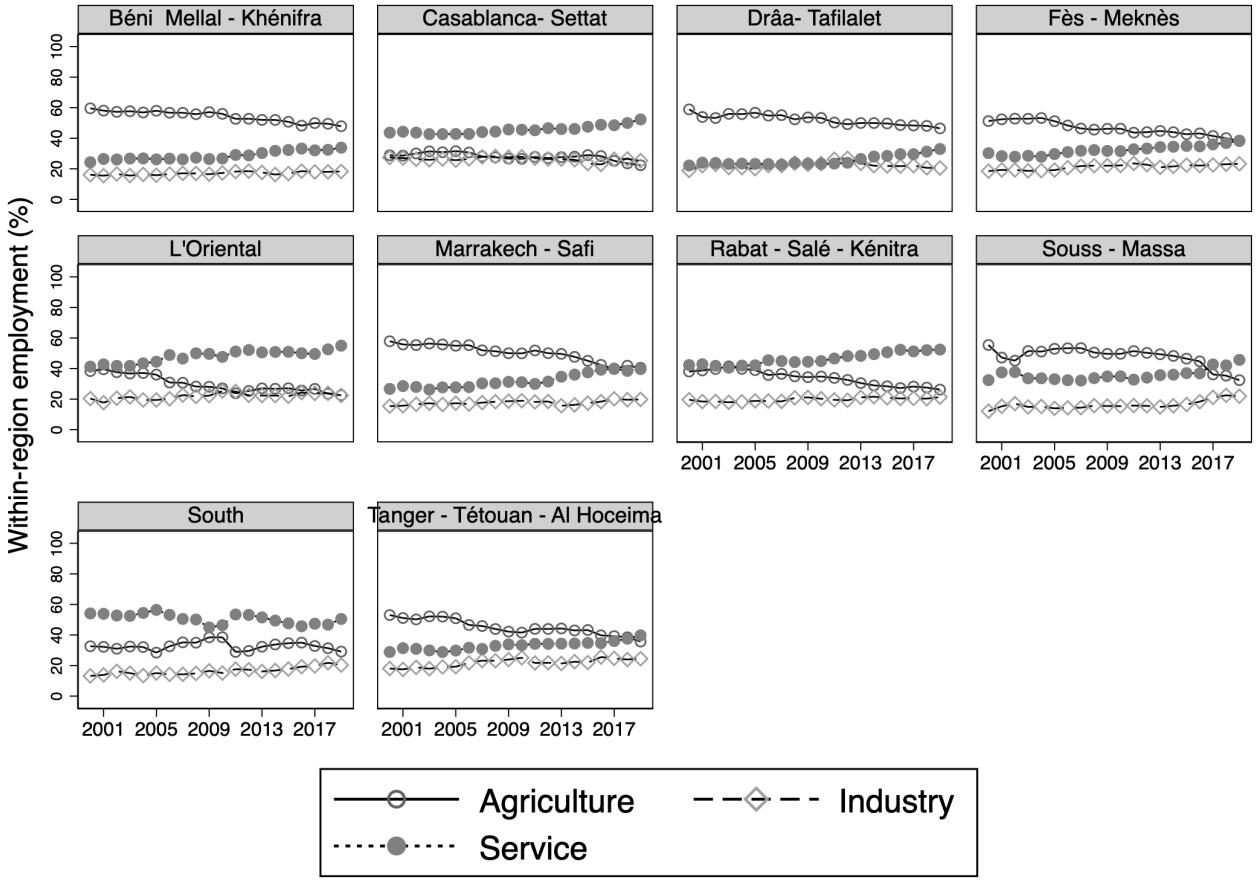
Figure A11: VA structure in Casablanca-Settat and Marrakechi-Safi by data source, 2014–16



*MEF: Ministère de l'Economie et des Finances; HCP: Haut Commissariat au Plan

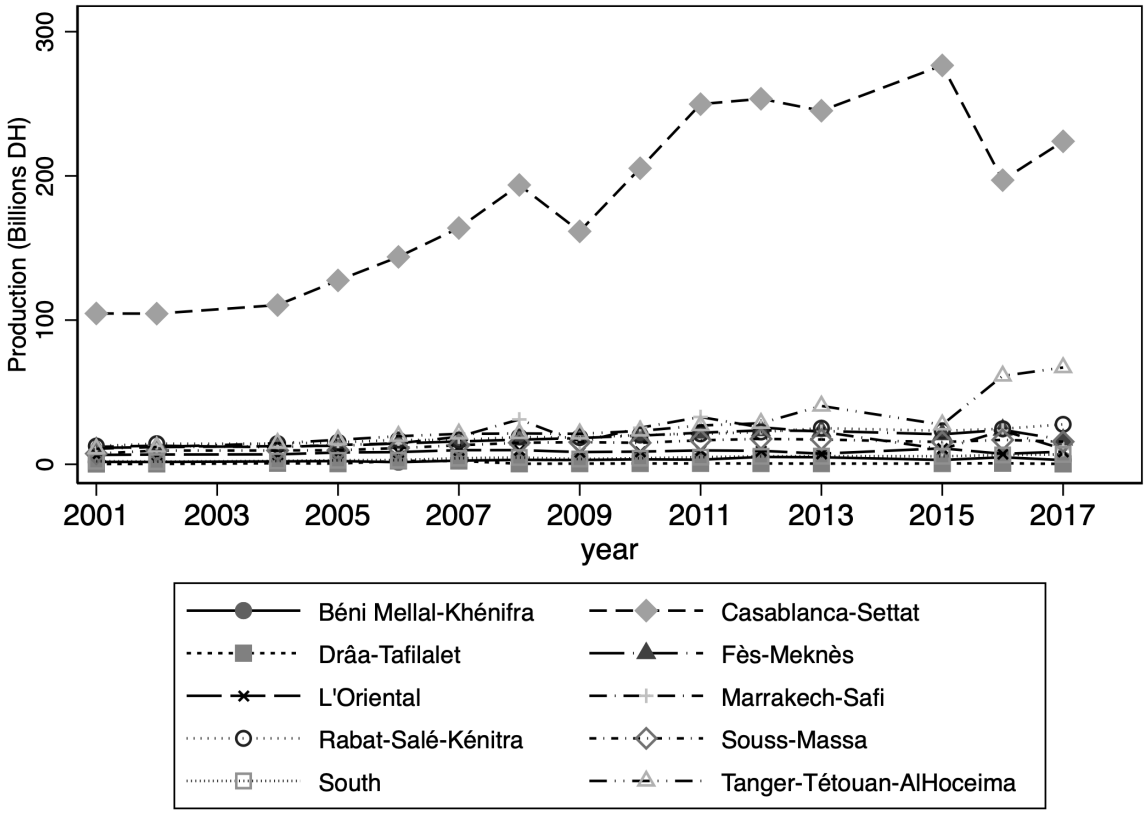
Source: authors' elaboration based on the METD.

Figure A12: Within-region sectoral employment, 2001–18



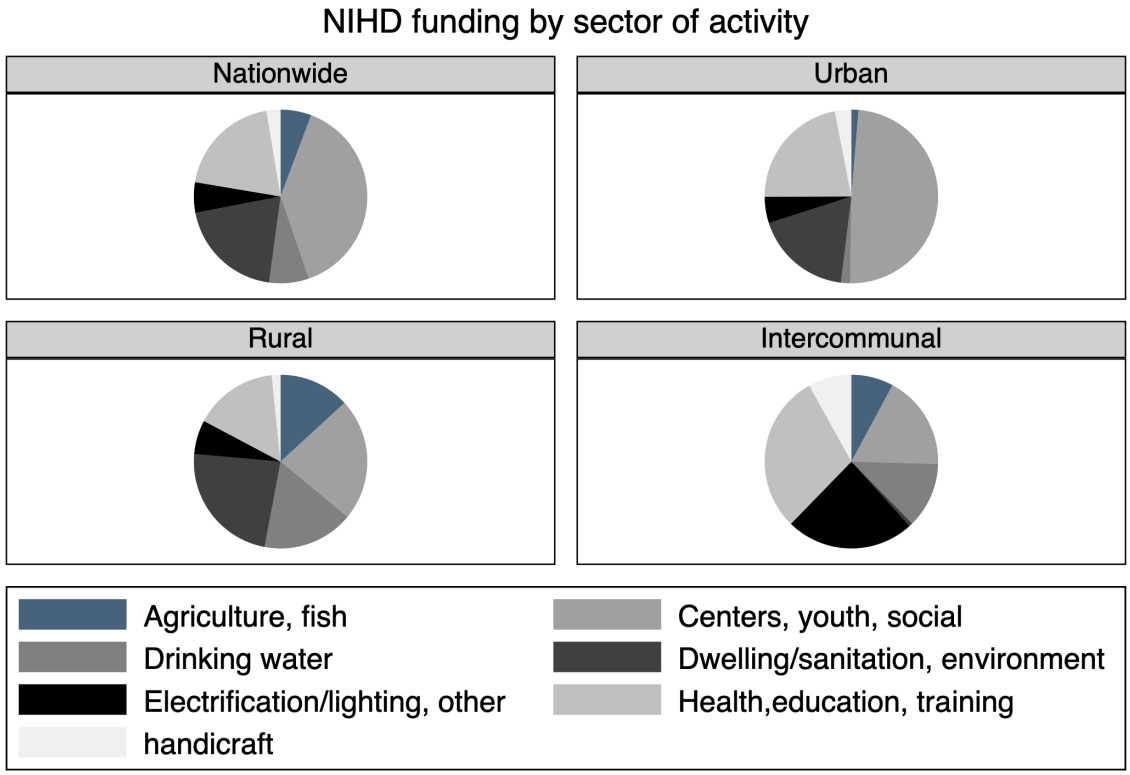
Source: authors' elaboration based on data collected from the Ministry of Economy, HCP.

Figure A13: Production in manufacturing sector (excl. mining, utilities)



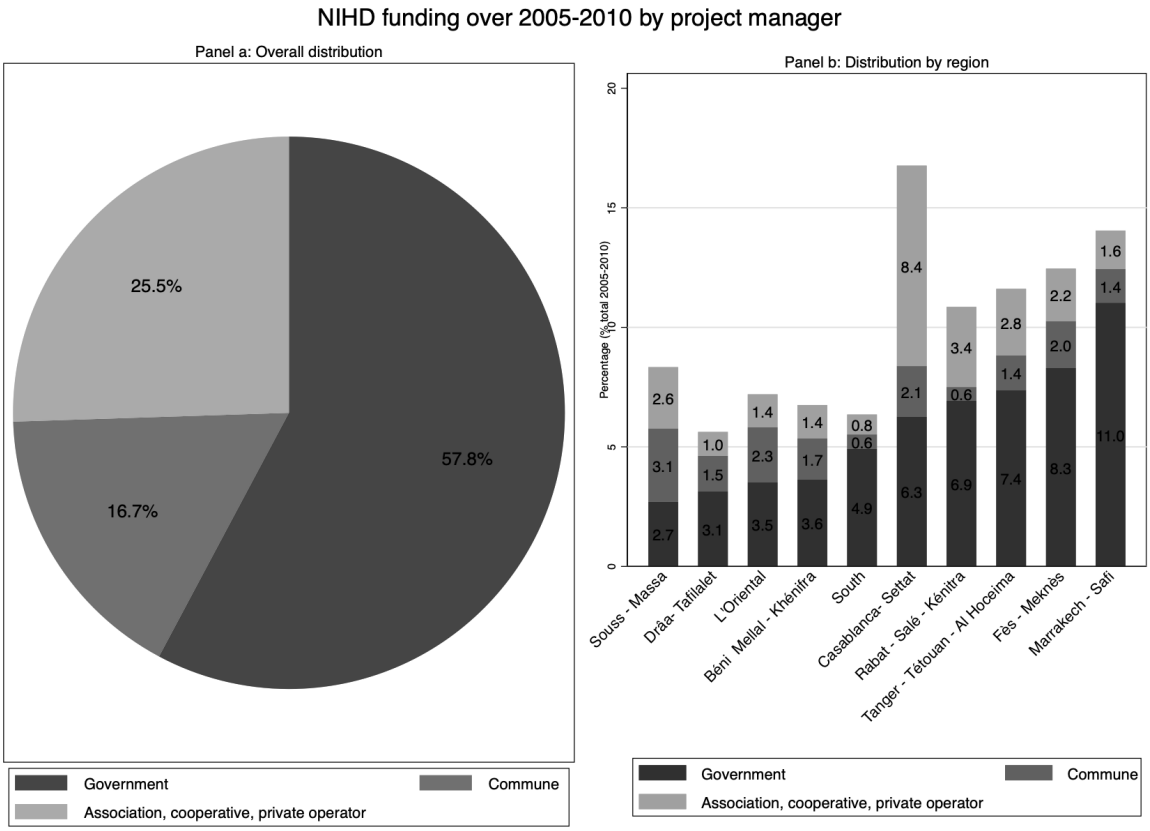
Source: authors' elaboration based on HCP statistical yearbooks.

Figure A14: Distribution of the NIHD funding by sector of activity



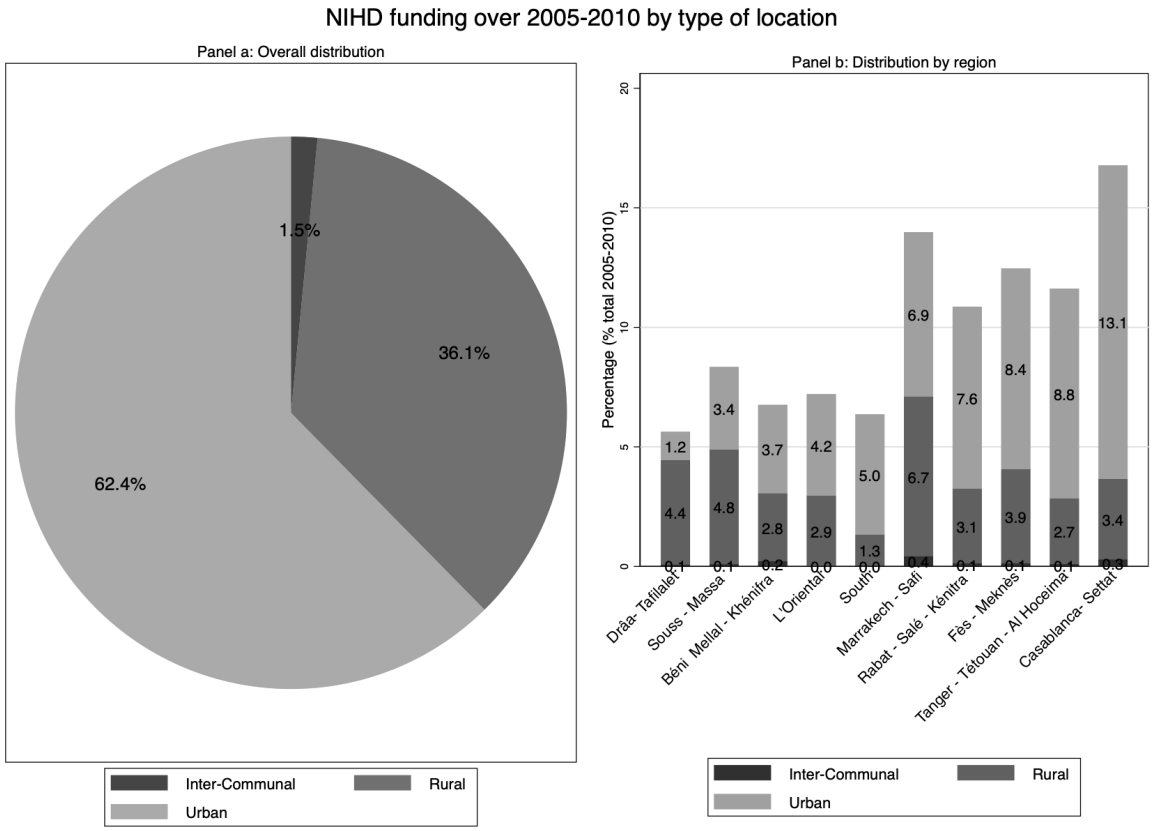
Source: authors' elaboration based on ONDH (2012).

Figure A15: NIHD funding over 2005–10 by project manager



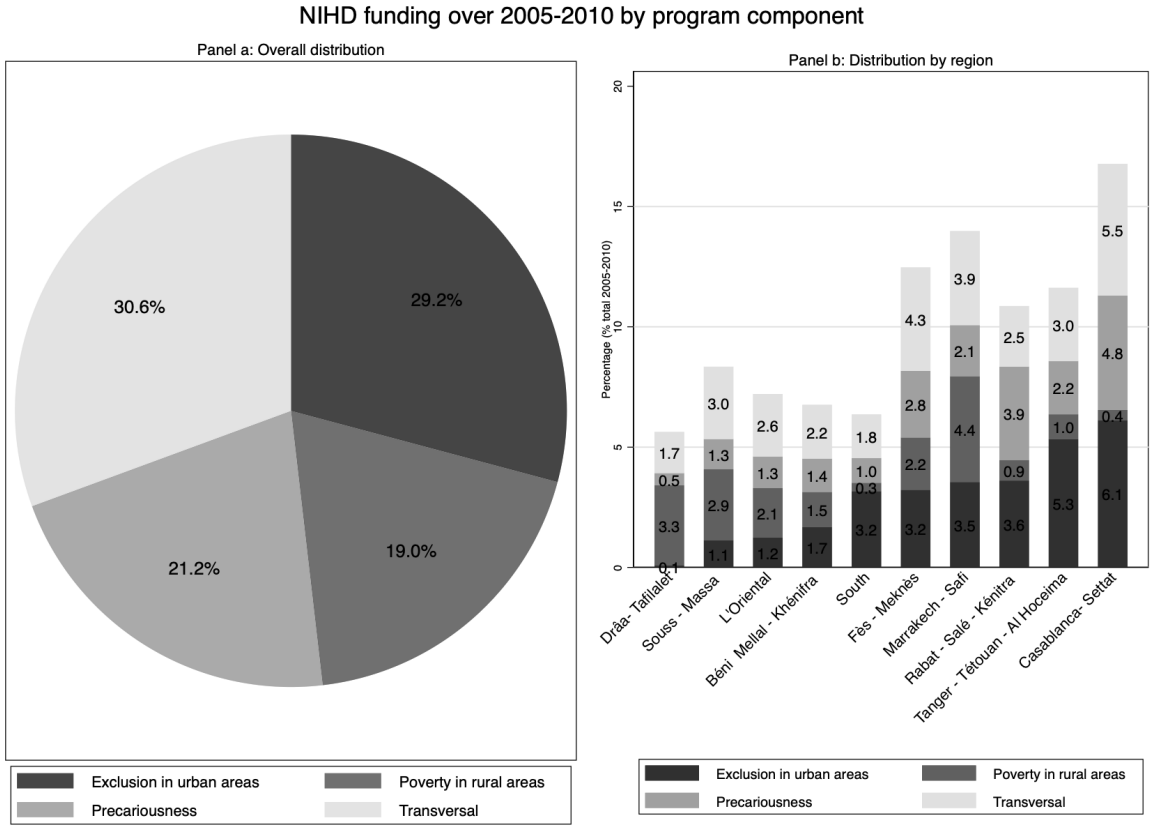
Source: authors' elaboration based on ONDH (2012).

Figure A16: NIHD funding over 2005—10 by type of location



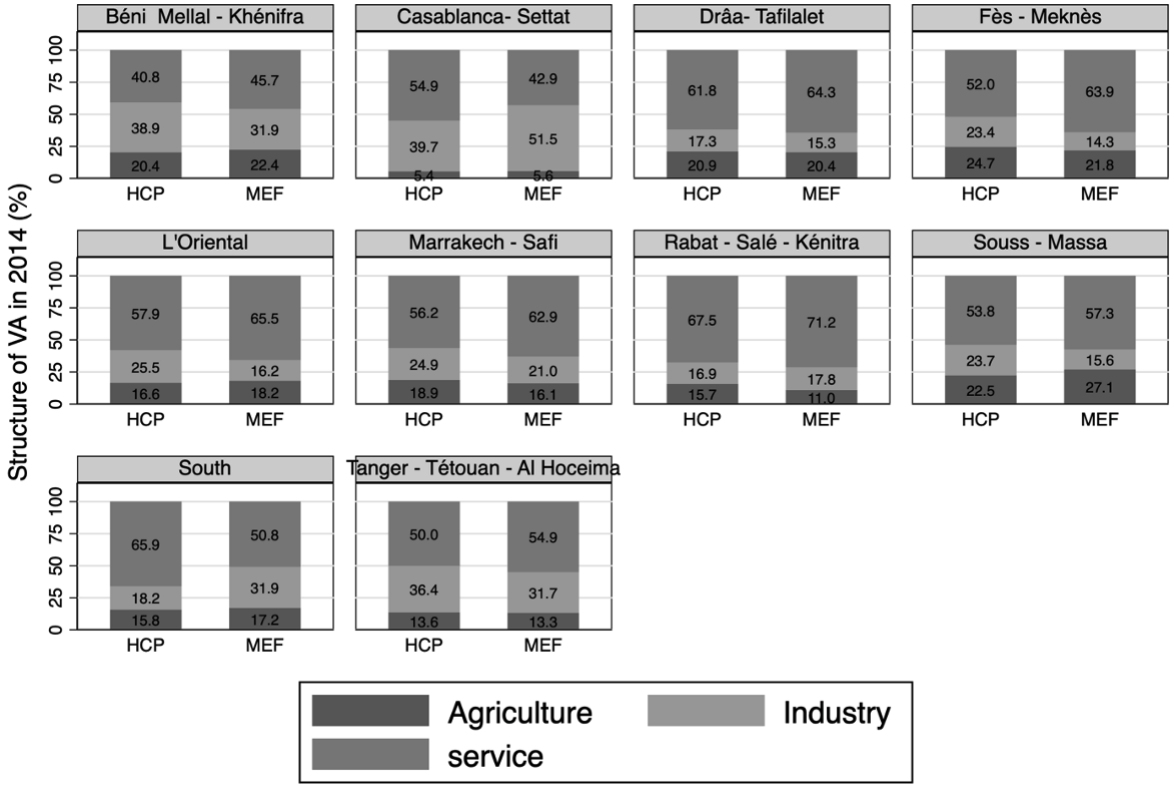
Source: authors' elaboration based on ONDH (2012).

Figure A17: NIHD funding over 2005–10 by programme component



Source: authors' elaboration based on ONDH (2012).

Figure A18: Structure of VA by data sources: 2014–16



Source: authors' elaboration based on HCP and MEF data.

B The MEF methodology: a summary

This appendix explains the methodology used by the MEF for disaggregating national VA data by region since our analysis is based mainly on regional data from the MANAR database. In fact, understanding these methods will allow us to apprehend the differences between the MEF estimations and the HCP database (it is necessary to inquire about the methodology used by the HCP beforehand) and to duplicate them in the event of obtaining the data used in the process, and to develop them and use them in subsequent problems.

The method of the disaggregation of national VA carried out by the MEF combines two methods: the bottom-up and the top-down methods. The choice of method is guided by the availability of data. In practice, the MEF begins by regionalizing the sector's production. Then it deducts the VA by subtracting intermediate consumption from production on the assumption that technical coefficients do not differ between regions:

$$VA_j = P_j - IC_j = P_j * (1 - TC) \tag{13}$$

where VA_j is the VA of region j, P_j is the regionalized production of region j, IC_j is the intermediate consumption of region j, and TC is the technical coefficients obtained from the input–output matrix.

Table B1: Methods used for the regionalization of the VA of sectors

Bottom-up	Top-down
The starting point is the aggregation of basic data on resident units in the region to obtain the regional total of the sectoral production concerned.	The starting point is the national sectoral production, which is broken down among the regions without regard to the resident units.
The sum of regional production is consistent with the national production.	From then on, consistency between national and regional production is immediately assured.

Source: authors' elaboration.

The top-down method

The top-down method of national production P proceeds in two steps following an approach called calibration–revision. The first step, calibration, consists in regressing P on a set of explanatory variables X_i for which regional information X_{ij} is available:

$$P = \beta_0 * S_j + \beta_1 * X_{1j} + \cdots + \beta_n * X_n + \varepsilon \tag{14}$$

where ε refers to the error term.

In the case of DEPF, the variables X_{1j} used according to sectors are presented in Table B2. The coefficients β_j are then recovered to calculate the regional production P_j using the following model:

$$P_j = \beta_0 * S_j + \beta_1 * X_{1j} + \cdots + \beta_n * X_{nj} \tag{15}$$

S_j is a distribution key that is often taken as a structure reflecting the weight of each region. The breakdown in this study was based on an average of the explanatory variables balanced by the model coefficient as follows:

$$S_j = (\beta_1 * X_{1j}/X_1 + \cdots + \beta_n * X_{nj})/(\beta_1 + \cdots + \beta_n) \tag{16}$$

The sum of regional production P_j obtained at the end of step 1 is not necessarily consistent with the national production P because of the error term. The second step of the top-down method, called revision, consists therefore in reconciling the regional productions with the national production. The principle of revision is to distribute the residuals ε of Equation (14) among the regions according to a distribution key so as to find the national production. The calibration adopted by the DEPF follows the following equation:

$$P_j = P_{j-} + r * S_j \tag{17}$$

with P_j the balanced regional production, P_{j-} the unbalanced regional production, and r the residual (difference between the observed value and the modelling value).

The bottom-up method

The bottom-up regionalization method is based on data collected at the lowest level (resident units in the region), which are then aggregated to the regional level. The nature of the data used and their sources are presented in Table B2. To ensure consistency between these regional data and national production, the structure of regional production P_j^* is applied to national production P as follows:

$$P_j = P * \frac{P_j^+}{\sum P_j^+} \tag{18}$$

with P_j^+ the regional production provided by an organization other than HCP (office, ministry, etc.), and r the residual (difference between the observed value and the modelling value).

Table B2: MEF method applied to each sector

Sector	Method	Variable or information
	Primary sector	
Agriculture	Top-down (calibration-revision)	Arable land area Production of grain Production of grain legumes Production of oil crop Production of foodstuffs industries, livestock Citrus arable land area Citrus production
Fishing	Bottom-up (making it consistent)	The information provided by the National Fisheries Office on the production of marine fisheries by region.
	Secondary sector	
Extractive industry	Bottom-up (evaluation of the information and ensuring consistency)	Information provided by the Exchange office and the Ministry of Energy on production volumes by product and by region in addition to local sales, as well as exports in value and volume for certain products.
Manufacturing sector	Making it consistent	The annual survey conducted by the Department of Trade and Industry provides VA decomposed by region and by business sector.
Oil refining and other energy products	Distribution between two regions	The production of this branch as provided by the national accounting will be distributed between the regions of Casablanca and Gharb-Chrarda- Béni Hssen regions up to 80% and 20% respectively
Electricity and water sector	Top-down (calibration–revision)	The production of thermal and hydraulic electricity Sales of electricity The production of water by the National Office for Drinking Water Overall sales of water
Construction and public works per region	Top-down (calibration–revision)	Consumption of cement Floor areas Estimated value of building
	Tertiary sector	
Hotels and restaurants	Top-down (calibration–revision)	Hotel capacity in number of beds occupancy rate for star-rated hotels Number of nights in star-rated hotels
Commercial services off hotels and restaurants	Bottom-up (based on the breakdown using a distribution key)	The active population involved is used as an allocation key assuming that labour productivity remains constant across regions
Non-traded services	Based on the breakdown using a distribution key	The distribution key was chosen based on the number of government employees provided by the Centre National des Traitements

Source: authors' elaborations.