Diversification and exporters performance: evidence from Mali

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Abstract: By expanding trade and reducing export concentration, export diversification is widely recognized as an important driver of economic growth. Diversification remains a challenge especially for African countries as exporting itself is a difficult, risky and complex activity. A country's capacity to diversify indeed depends on the ability of its exporters to introduce new products, serve new markets and survive. Relying on a novel dataset from Mali that contains the universe of export firm-level data for the period 2005-2008, this paper investigates the effect of supply-side and demand-side determinants on the probability of exporters to (i) introduce new products (ii) serve new markets and (iii) survive. Our results suggest first that market experience is a critical driver of product diversification, while transport costs constitute a major obstacle. Second, product experience and the existence of a support program have a positive effect on the probability to break into a new market. However, we cannot establish the directionality of the effect of the support program due to its potential endogeneity. Third, we find that market and product experience, as well as the existence of a support program have a positive effect on the survival of young exporters. Finally, our findings show that distance from the market has a negative effect on the probability of surviving. These results suggest that policies aiming at reducing transport costs and information asymmetries (e.g. export promotion activities) may be especially helpful in promoting export diversification in African countries such as Mali.

Keywords: Export diversification, firm performance, diversification

JEL classifications: F19, L25

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1. Introduction

By expanding trade and reducing export concentration, export diversification is widely recognized as an important driver of economic growth (see *inter alia* Cadot, Carrère and Strauss-Kahn, 2010; Lederman and Maloney, 2003; Al-Marhubi, 2000). Despite drawing a lot of attention, export diversification remains a major challenge for policy makers in developing countries, especially in Africa. Most studies addressing the issue have looked at the diversification process (and determinants) from a country perspective (see *inter alia* Shepherd, 2010; Amurgo and Pierola, 2008; Gómez and Volpe, 2008), but disregarded the firm-level dynamics underpinning such process.

Mali is a fascinating example of a country struggling to diversify its export activities. It is one of the countries with the highest export concentration in Sub-Saharan Africa. In 2008, about 85 percent of Mali's export revenues came from just two products: gold (75 percent) and cotton (10 per cent). Using a new dataset, that contains the universe of export firm-level data for the period 2005-2008 for Mali, we investigate the effect of supply-side (i.e. firm characteristics) and demand-side (i.e. product and market characteristics) determinants on the probability of exporters to (i) introduce a new product (ii) serve a new market and (iii) survive.

By introducing new products (product diversification), breaking into new markets (geographic diversification) or raising the share of existing low-value exports in total trade (consolidation)[1], a country can neutralize the negative effects that concentration can have on its growth prospects (for a detailed survey see Frankel, 2010). Such effects were first highlighted by Singer (1950) and Prebisch (1950), who argued that diversification into manufacturing products, could thwart the deterioration of the terms of trade in commodity-dependent countries.[2] It is also widely admitted that export concentration can lead to income volatility, macroeconomic uncertainty and low level of investments (Ghosh and Ostry, 1994), limited knowledge and technology spillovers (Hausmann and Rodrik, 2003),[3] rent-seeking behavior (Lane and Tornell, 1996) and political tensions (Collier and Hoeffler, 2004). In recent empirical studies, export diversification is also associated with high levels of development (Lederman and Maloney, 2003; Cadot *et al.*, 2010). At the same time, as the world becomes increasingly interdependent, the importance of diversification as a risk management strategy is also enhanced (Haddad et al., 2010).[4]

Despite the benefits of diversification, how to achieve it, remains unclear, but exporters undoubtedly are the engine of such process. Behind the process of product or (and) market diversification, there is a new or incumbent exporter that has introduced a product, or broken into a new market (or both). The consolidation of a product-market line also implies that a new or incumbent exporter began to sell a product-market line, already exported by others; or that an incumbent expanded the sales of a product-market line he was already exporting. By incorporating firms' heterogeneity into trade models, recent

[1] In order to raise the share of non-traditional exports (i.e. existing low-value exports), these have to grow faster than traditional exports.

[2] According to Singer and Prebisch (1950), export concentration in commodity-dependent countries can hamper development because of the price of commodities relative to manufactures would follow a (inherent) negative trend. Such downward trend in the relative price of commodities deteriorates the terms of trade of these countries, and results in a decline in exporters and producers earnings.

[3] According to Hausmann and Rodrik (2003), export concentration can limit the creation of knowledge and technology spillovers for the entire economy. Indeed, the absence of firms (i.e. first-movers) trying new product or market opportunities limits the diffusion of information and knowledge (e.g. information on foreign demand and quality specifications, competition and production processes) to the whole export community.

[4] In their paper, Haddad et al. (2010) show that the effects of trade openness on growth volatility are likely to be amplified when the export basket of a country is heavily concentrated

trade theory provides valuable insights on exporters' behavior. These models study firms' decision to export, introduce a product or serve an additional market; and highlight the relationship between firms' productivity and the number of exporters, exported products, and markets. In Melitz (2003)'s baseline model with symmetric countries, fixed market entry costs and a fixed export costs, a decline in trade costs (i.e. fixed or variable) lead to the entry into the export market of firms, which before could not afford to be exporters. The model implies that only the most productive firms will export but has no predictions as to the introduction of additional products or markets. Bernard, Redding and Schott (2010) refine Melitz's framework to account for multi-product and multi-market firms. Their model looks at the decision of whether to enter the export market, what products to produce, and which markets to serve. They introduce market-specific and product-specific fixed costs, interacting them not only with firm productivity but with product attributes. In their model, a reduction in variable trade costs induces surviving exporters to start selling abroad products, thus increasing the number of goods exported by each firm, as well as the number of markets. Other studies have focused on firm's market expansion and the factors that may affect exporters' decision of whether to break into new markets. In Melitz and Ottaviano (2008), larger markets are more difficult to break in as they exhibit a higher level of competition and feature lower mark-ups and higher aggregate productivity. Lawless (2009) extends Melitz' model by adding a market-specific fixed and variable costs, which generates a market-specific entry threshold. As a consequence, firms export only to those markets that are profitable giving their own productivity. This body of literature reveals that the introduction a product or/and a market depends positively on firms' productivity and negatively on fixed/variable trade costs associated with the export activity, a given product and market.

Based on these findings, recent studies have analyzed the effect of certain factors on the introduction of new products. They found that the number of products is positively affected by firms' experience (Alvarez et al. 2007), network effects (Cadot et al. 2010), export promotion programs (Volpe and Carballo, 2010) and to a certain extent by tariff reductions (Molina, et al. 2010). As for the determinants of market diversification, the evidence remains scant. Studies in this area have mainly focused on the process of market expansion and found that conditional on survival, exporters add markets in a gradual manner (Albornoz et al., 2009; Lawless 2009 and Eaton et al., 2007). This paper contributes to this growing literature by analyzing the determinants of both product and market diversification at the firm level; and trying to shed some light on the relationship between firm-level and aggregate diversification patterns, so far overlooked.

Using Mali's firm- and product-level data, we analyze Mali's diversification patterns and the underlying firm-level dynamics. We find that the majority of exports in each year are generated by a narrow group of exporters whose export portfolio is highly diversified; and that the failure rate among Malian exporters is significant. One in two exporters exits the market after one year. The data further shows that there is a lot of churning (i.e. exits and entries) at the exporter, product and market level, which could explain the patterns observed at the aggregate level (i.e. net effects), and in particular the lack of improvements in terms of diversification. Indeed, Mali's export structure is highly concentrated in terms of both products and markets, and this situation has not changed during the last ten years.

In order to get a more complete understanding of the diversification process, we decompose Mali's trade into an intensive and extensive margin for the period 1996-2008. The intensive margin refers to exports of an existing product to an existing market (i.e. expansion of existing trade relationships) while the extensive margin refers to new exports (i.e. expansion due to new trade relationships)

resulting from the introduction of a new product[5], new markets, or both. Such decomposition has the advantage of reflecting the possible forms of diversification and therefore allows us to assess their importance in Malian's trade.[6] The results suggest that export diversification has been mainly driven by the exports to new markets. The bulk of these exports have been generated by incumbent exporters which serve new markets with a product, they were already exporting or with a product they started to ship but that other firms were exporting. Along the intensive margin, diversification was driven by the expansion of non-traditional exports and by incumbent exporters.

Finally, we analyze the potential factors affecting exporters' decision to introduce a new product, serve a new market, as well as their survival. Our results suggest first that market experience is a critical driver of product diversification, while transport costs constitute a major obstacle. Second, product experience and the existence of a support program have a positive effect on the probability to break into a new market. However, we cannot establish the directionality of the effect of the support program due to its potential endogeneity. Third, we find that market and product experience, as well as the existence of a support program have a positive effect on the survival of young exporters. Finally, our findings show that distance from the market has a negative effect on the probability of surviving. These results suggest that policies aiming at reducing transport costs and information asymmetries (e.g. export promotion activities) may be especially helpful in promoting export diversification in African countries such as Mali.

The paper is organized as follows. Next section presents Mali's export structure. Section 3 looks at the exporters dynamics. Section 4 analyzes the sources of diversification at the country level and exporters contribution. Section 5 presents the results of the econometric analysis. The last section concludes and discusses policy recommendations.

2. Mali's export structure

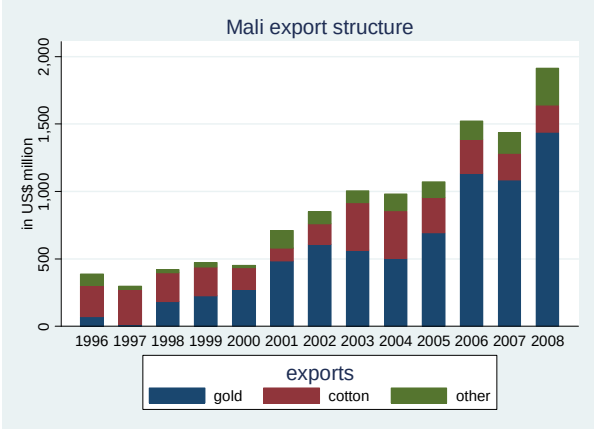
Malian exports have been growing since 2000, increasing from just US$ 0.5 billion to almost US$ 1.9 billion in 2008.[7] However, this trend mainly reflects the increase in the export value of one single commodity, namely gold (Figure 1).[8]

Gold is by far Mali's main source of export revenue accounting for US$ 1.45 billion and about 75% of total exports in 2008,[9] up from 60% in 2000. This increase in both absolute and relative terms has been mainly driven by the boom in gold prices, which more than tripled between 2000 and 2008 and went from about US$ 9,000/kg to 28,000/kg.[10] Cotton represents Mali's second largest export. It accounted

[5] Product diversification can further be decomposed into horizontal (new product – discoveries) and vertical diversification (i.e. quality upgrading, processing upgrading).
[6] Both margins can contribute to reduce export concentration. On the intensive margin side, the expansion of existing non-traditional exports (i.e. trade relationships with a small export share) could rebalance Mali's export portfolio. On the extensive margin side, trade growth through the introduction of new products or/and markets will have a direct effect on export diversification.
[7] The data used in this section come from COMTRADE and cover the period 1996-2008. There is no data available for Mali before 1996. The level of disaggregation is HS-6 digit.
[8] Gold in this chapter includes unwrought and semi-processed gold. The HS-6 digit code for unwrought gold and semi processed gold is "710812" and "710813" respectively.
[9] In 2008, Mali was the third African exporter of gold after South Africa and Ghana, and the 7th cotton exporter in the world (Source: Comtrade).
[10] By the end of 2010, the gold price reached US$ 44,043/kg (Source: UNCTAD Statistics). Gold volumes (unwrought gold) also rose during this period but were very volatile with peaks in 2002 (i.e. 71 tons) and 2006 (i.e. 62 tons).

for 10% of exports in 2008 or US$ 203 million, against US$ 162 million in 2000.[11] As for non-gold and non-cotton exports, they have slowly expanded since 2002 and reached almost US$ 274 million in 2008, up from US$ 89 million in 2002.

Figure 1



Geographically, Malian exports are also highly concentrated. South Africa was Mali's main trade partner during most of 1996-2008 period. In 2008 exports to South Africa accounted for 73% of total exports but these consisted mainly of gold. It was followed by Senegal (7.0%) and Ivory Coast (2.5%). If we exclude gold, Mali's main partner becomes Senegal and South Africa only ranks 27th (as of 2008).

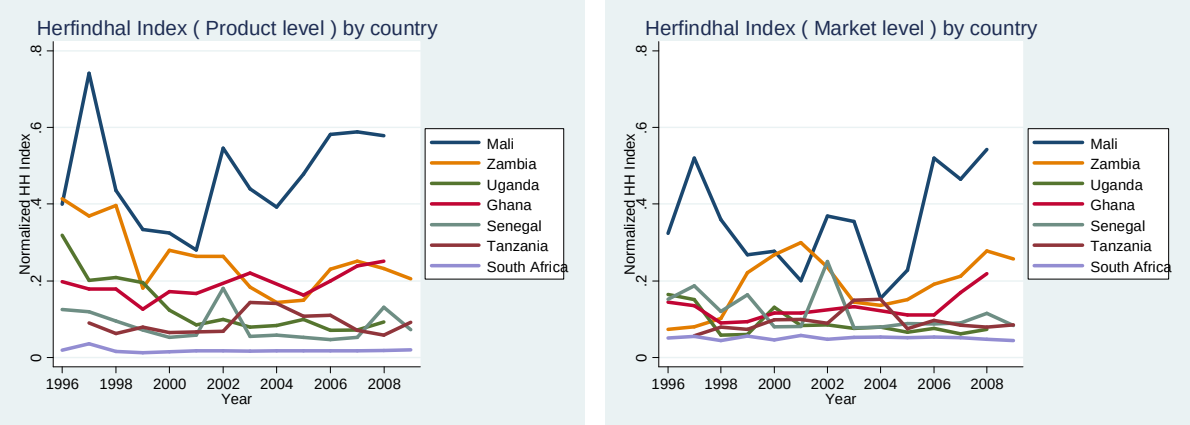
To evaluate more formally Mali's export structure and its evolution, we compute the Normalized Herfindahl-Hirschman (NHH) index which measures the degree of product concentration of a country's export portfolio.[12] It ranges between 0 and 1 with a value close to 0 indicating high diversification. An index close to 1 suggests high concentration. The NHH Index is computed for each year of the period under review for Mali and six other Sub-Saharan countries.[13] We also compute the NHH Index at the market level. Results are exhibited in Figures 2a and 2b.

[11] Cotton exports have exhibited large fluctuations between 2000 and 2008 due to the extreme volatility of prices and volumes, which both returned in 2008 to their 2000 levels

[12] For a given year, the NNH index is computed according to NNH$= \frac{\sum_k s_k^2 - 1/n}{1-1/n}$, where s_k is the share in total exports of good *k* and *n* the total number of exported goods (at the HS-6 digit of disaggregation).

[13] According to the latest World Bank data (i.e. latest year is 2006), among the 50 Sub-Saharan African countries, Mali is the 11th country with the highest degree of export concentration. Angola's export portfolio is the least diversified, followed by Equatorial Guinea and Sudan. Other countries with a more concentrated portfolio than Mali include Nigeria, Gabon, Libya, Guinea Bissau and Mauritania. Source: World Bank Database's African Development Indicators. Figures are for 2006, the latest year available.

Figures 2a and 2b



In both cases, Mali displays the highest export concentration among the comparator countries, while South Africa exhibits the highest level of diversification.

In conclusion, the data confirm that Mali is heavily dependent on a very narrow base of products and markets, and that this situation has not changed during the last ten years.

3. Malian exporters: firm-level dynamics

Diversification is a challenge as exporting itself is a difficult, risky and complex activity. A country's capacity to diversify depends on the ability of its exporters to introduce new products, serve new markets and survive. To understand Mali's diversification process, it is thus crucial to understand exporters' performance. With this objective, we analyze the dynamics among Malian exporters using a very detailed export firm-level dataset provided by Mali's Custom Agency.[14] The dataset contains the value and quantity of all transactions by destination and by product at the HS 6-digit level for all exporters[15] for the period 2005-2008. Thanks to its granularity, the dataset provides valuable insight into exporters' product and market diversification strategies, as well as on their survival. None of which have been documented in previous studies.

Exporters, products and markets

Table 1 reports the number of exporting firms, products and markets between 2005 and 2008.

[14] It is worth noticing that there is a significant difference in 2006 between the data published by Comtrade and the data collected by the Customs Authorities. In that year total exports from the firm-level dataset were 23% higher than the total exports by Comtrade. Such difference comes from recording differences in the cotton and golden category. For the other years, the difference is on average less than 4%.

[15] Exporters are identified through their names.

Table 1: Summary statistics of Malian exporters

	2005	2006	2007	2008
products by firm:				
mean	3.8	3.9	3.5	4.3
median	2.0	2.0	2.0	2.0
top 10% percentile	9.0	9.0	8.0	10.0
markets by firm:				
mean	2.2	2.4	2.3	2.2
median	1	2	1	1
top 10% percentile	5.0	5.0	4.0	4.0
number of firms excluding gold companies	267	276	313	328
number of firms	273	280	322	337
number of products	578	575	629	741
number of markets	71	77	74	69

The data[16] reveal that the number of exporters and products has increased in the last four years to 2008. In that year, Mali exported 741 different products, 22% more products than in 2005 and the number of exporters rose from 269 to 328. Meanwhile, the number of served markets remained basically constant – 69 in 2008 against 71 in 2005.[17] Compared to other countries in the region, Mali displays the lowest number of export markets and of exported products. On average, countries in the comparison group exported 2,287 products to 144 destinations during 2008.[18]

Exporters' portfolio

The data also shows that multi-product and multi-market exporters, who represent on average less than half of exporters (i.e. 40% or 118 exporters), account for almost (i.e. 92.0%) all Malian exports (Figures 3a and 3b). Within this group, exporters shipping more than five products generate 68.6% of total exports, with one third coming from exporters that serve two to four markets and the rest coming from exporters that serve more than five markets (see Appendix 1). In contrast, the rest of exporters who represent about 60% of Malian exporters generate only 8.0% of total exports. The majority of these exporters sell only one product to only one market (i.e. 57%), while 30% export one product but to various markets and 13% export various products but only to one market. These figures show that at the firm-level exports are also very concentrated within a narrow group of exporters. Most exports come from firms whose export portfolio is well diversified in terms of both products and markets, which is in line with evidence found for other developing and developed countries (see *inter alia* Amador and Opromolla, 2010; Molina et al., 2010; Bernard et al., 2007).[19] This also reflects the

[16] The firms' universe during this period consists of 1,212 firms, among which not all export in every year (i.e. 103 firms exported in every year). For accuracy purposes, we exclude embassies and couriers. For a more detailed description of the dataset refer to Cadot et al. (2010).

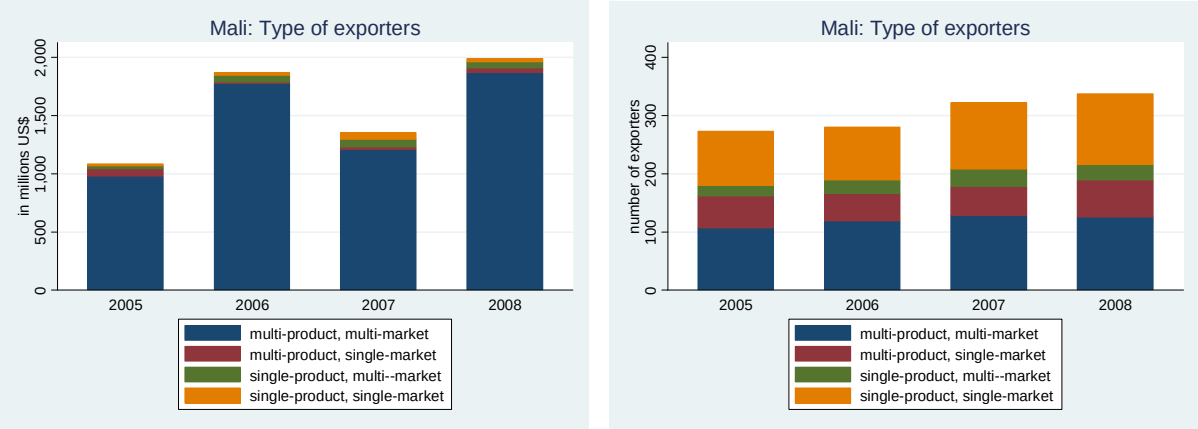
[17] However, this does necessarily mean that the set of export destinations between 2005 and 2008 was the same. The data show that there is churning. The number of markets that were the same in 2005 and 2008 was 51 or around 73% of the total number of markets in these years. The rest reflect exporters' dynamics of market entry and exit. More precisely, there were 18 markets that were served in 2008 but not in 2005 (i.e. market entries) and 20 markets that were not served in 2008 but were in 2005 (i.e. market exits).

[18] The set of comparator countries is the same than the one used in Section 2, namely Ghana, Senegal, South Africa, Tanzania, Uganda and Zambia. These figures seemed to suggest that diversity in the number of products and markets is a necessary but not sufficient condition to achieve export diversification.

[19] We also compute these figures but excluding firms exporting gold. Results are not shown due to space consideration and are available under request. The patterns and percentages remain almost the same: multi-product and multi-market exporters account on average 40.7% of non-gold exporters and for 83% of non-gold exports. The patterns regarding the number of products and markets are also very similar. Such results also show that gold exporters are also multi-product (e.g. export other minerals or gold under different forms) and/or multi-market firms.

heterogeneity among exporters in terms of productivity and their weight in Mali's trade structure. Indeed, according to recent trade models, the number of exported products and markets is positively correlated with firms' productivity (Bernard et al., 2010).

Figures 3a and 3b



Exporters' survival

As previously mentioned an important dimension for export diversification is the capacity of exporters to enter new markets, introduce new products and survive. Survival is a key indicator of export performance as high failure rates (i.e. low survival) prevent exports from expanding and thus hamper diversification efforts. In Besedes and Prusa (2007), the authors show that in order to have a significant impact on export growth, trade relationships must survive and expand. The authors characterize export performance along three dimensions: the survival, deepening (i.e. expansion) and entry of trade relationships. Using South Korea and Spain as reference countries,[20] they show that developing countries would have exhibited much higher export growth if they had enjoyed the rates of survival and expansion of South Korea or Spain. Having the same entry rates would have also affected export growth but by less, thus suggesting that the largest effect on export growth can be achieved by improving survival and deepening of trade relationships. In order to characterize the survival patterns of Malian exporters, we distinguish among existing exporters, new exporters and exporters that exit the market. We defined existing exporters as those that exported in *t-1* and in *t*. New exporters are firms that exported in *t* but not in *t-1*, while exiting exporters are those that exported in *t-1*, but not in *t*.

[20] They pick these countries as they exhibited strong export growth between 1975 and 2003.

Figure 4

For the period 2006-2008, existing exporters accounted for some 60% of the total number of exporters and generate almost all exports in each year (see Appendix 2). The data (Figure 4) also show that between 2005 and 2008, there were on average 134 new exporters each year (i.e. firms that export in period *t*, but that did not in *t-1*), although about half of them stopped exporting after one year (i.e. failure rate was 54.2%).[21] Moreover among the 121 new exporters in 2006, only 33 (27%) exported for at least three consecutive years. These figures show that there is lot of trial and churning (i.e. entry and exit) among exporters but that their survival is very limited.[22] Low survival among exporters has been well documented for developed and developing countries (see *inter alia* Eaton et al., 2007, Cadot et al., 2010); and Malian exporters are no exception. According to donors' officials and Malian exporters, reasons for failure in Mali, especially in the agricultural sector, include poor knowledge of the exporting activity, lack of professionalism, strong competition and payment default.[23]

We also characterized exporter-product, exporter-market and exporter-product-market combinations (i.e. relationships) in a similar way and found that the churning is amplified (see Appendix 3). In each case, new relationships (i.e. new exporter-product, new exporter-market and new exporter-product-market combinations) accounted for the majority of the total number of trade relationships in each year. As for the number of exits, it was almost as high as the number of new entries in almost all years. For instance, there were on average 1'234 new firm-product-market combinations in each year: among which 82% failed after one year and only 9% lasted for three years. Due to the high degree of churning, the effect of products and markets' exits is likely to offset the effect of new products and markets on diversification.

To summarize, we found that (i) despite an increase in the number of products and exporters, Mali remains highly concentrated; (ii) the majority of exports in each year are generated by a narrow group of exporters (i.e. about 40% of total exporters) whose export portfolio is highly diversified; (iii) failure rate among Malian exporters is high: one in two exporters exits the market after one year; and (iv) that churning is important at all levels (i.e. exporter, exporter-product, exporter-market, exporter-product-

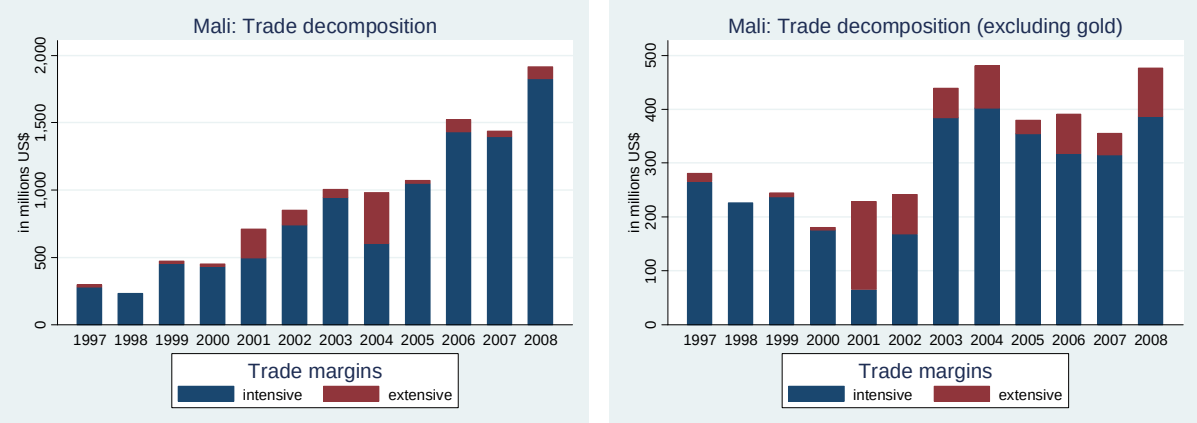
[21] The probability of failure or probability of exiting the market after one year is given by the number of exporters that exit the market in *t* given that they entered in *t-1* relative to the number of new exporters in *t-1*.
[22] Overall between 100 and 120 firms stopped exporting in any given year.
[23] Interviews (i.e. in total 18) were conducted in November 2010 with exporters, donors and government officials in Mali. Exporters were selected from the exporters' directory and according to their experience (i.e. experienced, young and non regular exporters). Some of the exporters were also identified with the help of the API (Agence pour la Promotion des Investissement). With the help of exporters' associations, we also identified and interviewed exporters that exit the market in previous years. Most exporters operate in the agribusiness.

market level). This last point is crucial as the high number of new entries but also of exits at the exporter, exporter-product and exporter-market level, could in part explain the net effects observed at the aggregate-level. By improving survival rates, new products and markets could have a greater effect on diversification. Indeed, conditional on their survival, exporters can develop, grow and ultimately contribute to rebalance Mali's export portfolio by operating in new markets, new products or in non-traditional exporting sectors.

4. Export diversification: aggregate-level dynamics

To get a better understanding of the linkages between firm- and aggregate-level dynamics, we analyze Mali's patterns and channels of diversification. We start by decomposing trade for any given year into two components: an intensive margin and an extensive margin. We then examine each margin. Such decomposition can bring valuable insights as both margins can be important sources of export growth and diversification. The intensive margin refers to the set of existing trade relationships – (i.e. existing product- market combinations), which are defined as relationships that existed in *t* and *t-1*. As for the extensive margin, it refers to the set of new trade relationships (i.e. new product-market combinations). New relationships are those that existed in *t* but not in *t-1* and consist of the exports of new products (i.e. product diversification), to new markets (i.e. market diversification), or both (i.e. product and market diversification). [24] Growth through the extensive margin (i.e. growth through new exports) constitutes a direct channel of diversification as it increases the number of products and markets. On the other hand, growth along the intensive margin (i.e. increase in exports of an existing product to an existing market) can contribute to rebalancing Mali's export portfolio if it occurs in those non-traditional exports such that the share of these exports increases relative to traditional exports.

Figure 5a and 5b



In Mali, the intensive margin has been the main component of exports (i.e. 95% of total exports, except in 2001 and 2004) and in most years the main driver of growth (Figure 5a). Yet, this situation reflects mainly the growth in gold exports. Figure 5b, which reports the decomposition analysis when excluding gold, shows that the intensive margin remains the main trade component (with an average share of 86%) but that growth along both margins has been weak and erratic.

[24] The same definition of *new* and *existing* applied to trade relationships (i.e. product-market combinations) is applied to products and markets. For instance, a new product is a product that is exported in *t*, but not in *t-1*. An existing product is a product exported in *t* and *t-1*. It is worth noticing that since new trade relationship refers to a new product-market combination, it can also result from the combination of an existing product and an existing partner. In this study, we consider this component a source of market diversification.

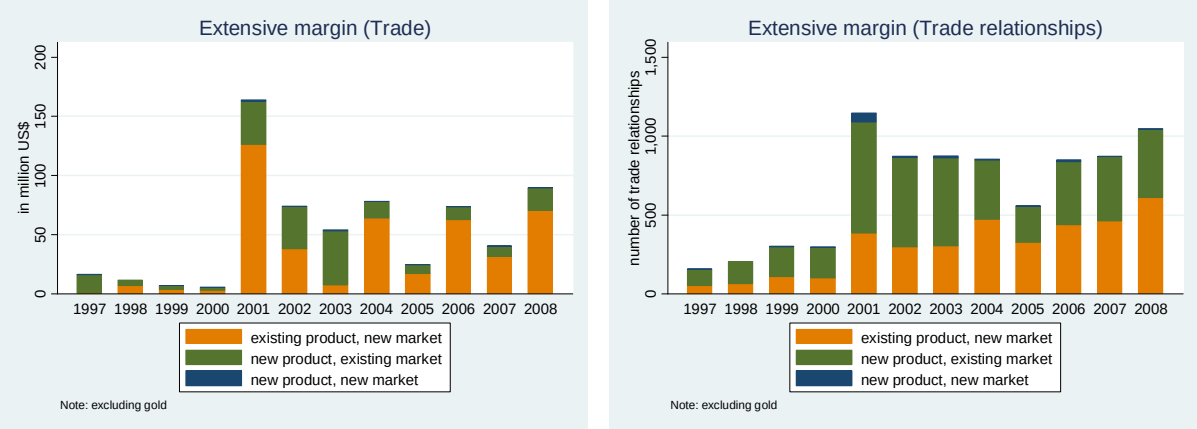
4.1. Sources of diversification at the extensive margin

The extensive margin consists of:

- Exports of a new product to an existing market (product diversification)
- Exports of an existing product to a new market (market diversification)
- Exports of a new product to a new market (product and market diversification)

Such decomposition can bring valuable insights as each component can be associated with a different type of diversification. In Figures 6a and 6b, we sketch the contribution of each component in terms of exports and trade relationships in 1997-2008.

Figures 6a and 6b



For accuracy purposes, we exclude gold exports. The data shows that in recent years Mali's extensive margin in terms of exports and trade relationships has been driven mainly by exporters' expansion into new markets rather than by the introduction of new products. Indeed, exports to a new destination of an existing product accounted on average for 67% of the exports at the extensive margin during the surveyed period, while exports of new products (i.e. product diversification) remain very limited (i.e. on average 32%) and exports of new products to unexplored markets (i.e. product and market diversification) are almost inexistent (i.e. 1%).[25] At the same time, the number of new trade relationships based on the exports of an existing product to a new market has increased since 2004 to reach 58% of the total number of relationships in 2008.

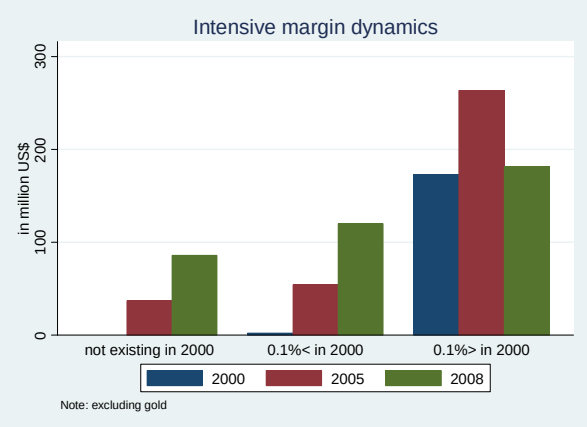
4.2. Sources of diversification at the intensive margin

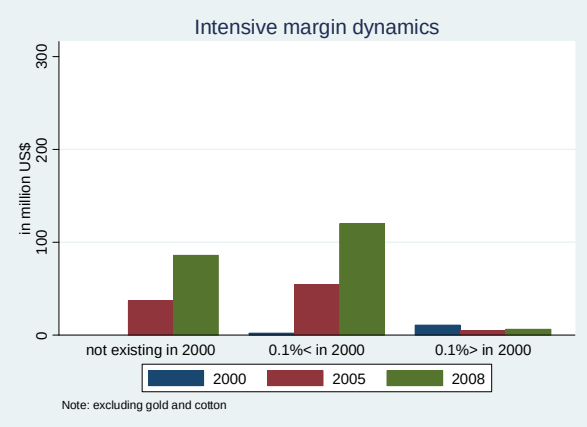
Looking at the export dynamics within the intensive margin -existing trade relationships- is also essential to understand the diversification process. Indeed the expansion of non-traditional products that are currently being exported in limited quantities could help to reduce a country's export concentration. By reasing non-traditional exports, their share in total exports could increase if they grow faster than traditional ones. To analyze this possibility, we identified those relationships that accounted for less than 0.1% of non-gold exports in 2000, and compute their contribution in 2005 and

[25] It is worth mentioning that the surge on the exports of an existing product to a new market observed in 2001 in Figure 4a reflects the exports of cotton (existing product) to new markets. In that year, their value amounted to US$ 97 million or 59% of the extensive margin. Cotton was notably exported to 26 new destinations in 2001 including Thailand (US$24 million) and Taiwan (US$ 12 million) compared to only two destinations (i.e. Senegal and Cote d'Ivoire) in previous years (Source: Comtrade).

2008.[26] We do the same for the relationships that account for more than 0.1% of non-gold exports in 2000 as well as for those that did not existed yet in 2000. Figures 7a and 7b show the results.

Figures 7a and 7b





Products that were not exported in 2000 or that accounted for less than 0.1% of non-gold exports within the intensive margin reached $US 206 million in 2008 (against $US 2 million in 2000). In contrast, exports with a share greater than 0.1% in 2000 went from $US 172 million to $US 181 million in 2008, that is 5% more than in 2000. If we exclude cotton, non-gold exports with an export share larger than 0.1% in 2000 were about $US 5 million and remained almost at same value (i.e. $US 6 million) in 2008. These figures show that it is non-traditional exports (i.e. exports that did not exist in 2000 or that had small export shares) which have expanded the most and have driven the growth along the intensive margin in the last decade. Among non-gold exports, products that did not exist in 2000 or accounted for less than 0.1% and that greatly expand (i.e. more than 400% cumulated growth) were livestock (especially live sheep), minerals, sesame, cereals, seeds, footwear, and mechanical appliances. Products showing the greatest performance in 2008 (i.e. more than 400% cumulated growth) among products with an export share larger than 0.1% in 2000 were plain weave cotton and fruits (including mangoes and guavas).[27] Yet, such progression has proved to be insufficient to reduce the inequality within Mali's export portfolio given that cotton still accounts for 45% of non-gold exports at the intensive margin.

4.3. Behind the extensive and intensive margins

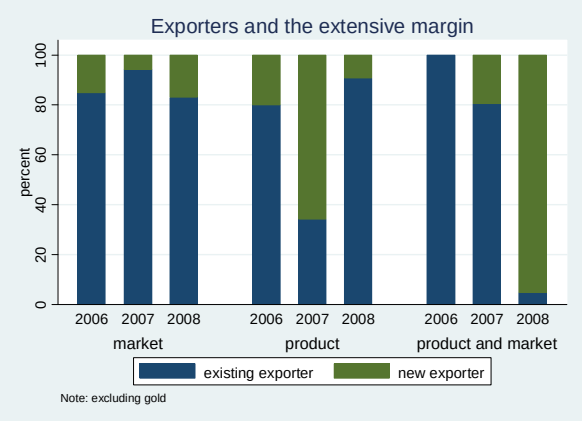
The data shows that Mali's main source of diversification has been the expansion i) into new markets and ii) of non-traditional exports along the extensive and intensive margin respectively. This means that along the extensive margin, growth has been driven by new or incumbent exporters that start serving a new market, either with a product they were already exporting or with a product other firms were already exporting. In addition, this could indicate that breaking into new markets is relatively easier than introducing a new product. Indeed, once a product has been successful in a given market, it is very likely that the cost to start selling it to another market is lower than starting exporting an entirely new product. As for the intensive margin, its main driver has been non-traditional exports,

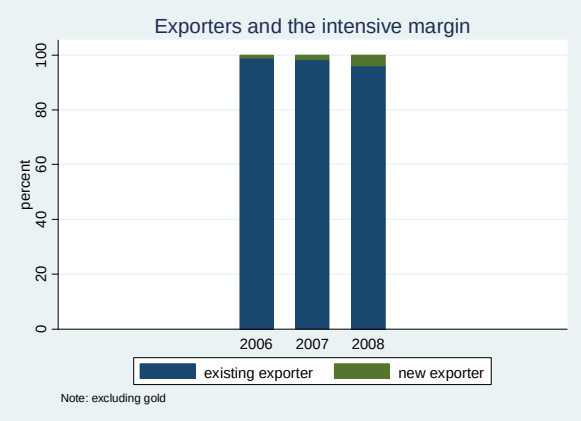
[26] We choose 0.1% as a threshold which in terms of value represents around $US 175 thousands in 2000. The majority of the export lines in 2000 had a value lower than 0.1% and by using this threshold we can at look the evolution of a larger number of trade relationships than if we use a more restrictive threshold. We also apply two other thresholds 0.05% and 1% (includes all products except cotton). The results remain very similar.

[27] In the case of mangoes, their exports have experienced an important increase only in recent years, although they have been traded since the 70's. In fact, their share in non-gold exports was larger than 0.1% in 2000.

thus implying that the intensive margin has been driven by new or incumbent exporters that expand the sales of a product-market line they were already exporting or that they start exporting a product-market line, others were already exporting. In order to assess the role played by existing and new exporters in trade diversification, we compute their share on each of the components of the extensive and intensive margin. Figures 8a and 8b present the results in 2006-2008.[28]

Figures 8a and 8b





The data suggest that most of exports at the extensive margin came from incumbent exporters and this regardless of the component in consideration. There were two exceptions. In 2007 and 2008, it was new exporters who drove the exports of new products and of new products to new markets respectively.[29] As for the dynamics within the intensive margin, experienced (i.e. existing) exporters were also the main players behind the expansion of the intensive margin (Figures 8b). These results are not necessarily surprising given the high failure rates among new exporters, which could explain their scant contribution to the extensive and intensive margin. In addition, there may be barriers to entry which could be preventing new exporters from exploring new product and market opportunities.

In both cases, incumbent exporters appear as the main players behind the two margins. Yet, the factors affecting exporters' survival, as well as their decision to introduce a product or break into a new market remain unclear. In the next section, we tried to shed some light on this issue.

5. What drives firm export diversification?

Using the firm-level data provided by Malian Customs Authorities for the 2005-2008 period, we assess the role of supply and demand-side factors, as well as of product characteristics and information spillovers on the ability of firms to (i) introduce new products; (ii) serve new markets; (iii) and survive. Supply-side factors are captured by exporters' characteristics, while demand-side factors are proxied by market characteristics.

5.1. Product diversification

In order to better understand how product diversification occurs, we analyze the effect of firm and market characteristics on the probability of an existing exporter to introduce a new product. The equation to be estimated is the following:

[28] Existing and new exporters are defined as in subsection 4.1.
[29] A similar pattern was found in the case of Malawi, Senegal and Tanzania.

$$Prob(NewProd = 1)_{ijt} = \beta_1 FirmCs_{it} + \beta_2 MarketCs_{jt} + \beta_3 Controls_{jt-1} + \epsilon_{ijt}$$

The dependent variable equals one if firm *i* exported a new product to market *j* in time *t*, and zero otherwise. Firm characteristics include exporter size and its experience in market *j*. Exporter size is measured by the sales (in log) in *t-1* while market experience is proxied by a dummy that equals one if firm *i* had a previous (i.e. in *t-1*) export experience in market *j*. Besides, the expertise an exporter can acquired through experience, this latter could help exporters getting funding to implement their plans of product or market expansion. Indeed, financial institutions in Mali may be better disposed towards financing exporters that are active in a given country and present a good track record.

We introduce two other firm characteristics, namely the number of products and the number of markets that a firm respectively exported and served in *t-1*. Thanks to their experience in managing different products and markets, multi-product and multi-market firms may find easier to introduce another product in a given market. As mentioned before, this variable could also reflect firm's productivity. Indeed, according to recent studies (Bernard et al. 2007; 2010) most productive firms show the largest number of products and markets.[30]

We also add the number of firms exporting to market *j* in *t-1* as a proxy for information spillovers. The existence of other Malian exporters in market *j* could reduce export uncertainty (Nicita et. al, 2003). On the exporter side, Malian firms may find it easier to approach buyers and establish business relationships in countries where Malian exporters are already active.[31] On the importer end, buyers already familiar with Malian suppliers and products are likely to be willing to do further business with Malian firms. The number of exporters in a market may be also seen as a sign of profitability and attract other exporters. It can therefore capture market attractiveness.

As for the market characteristics, we include the distance to market *j* (in log) as a proxy for transport costs and the GDP per capita (in log). GDP per capita is an indicator of consumers' affluence and sophistication. Finally, an interaction term between exporter size and distance is included. The purpose is to evaluate whether the effect of distance varies with the exporter size. A positive coefficient for the interaction term would imply that distance is less of a constraint for larger exporters. To control for other period and product non-observables, we include time and product (HS 2-digit) fixed effects. The latter corresponds to the main sector in which a firm operates.

For our estimation, we use a linear probability model.[32] Results are reported in Table 2. Three specifications are considered. The first one includes firm characteristics. The second one adds market characteristics and the information spillover variable. The last one includes the interaction term between exporter size and distance.

[30] The variables on firm characteristics are based on the information in the firm-level dataset. Given the nature of the dataset, we dispose information only on firms' exports, markets and products, which limits the variables that we could use to capture firms' characteristics. There is no data available on firm's employment, ownership, productivity or domestic sales (if any).
[31] Assuming Malian exporters have a positive reputation, which is likely to be the case if they survive.
[32] The main drawback of the LPM model is that the predicted probabilities can be negative and larger than one. But despite this, the LPM estimator is deemed to provide a good indication of the magnitude of the effect.

Table 2: Probability to introduce a new product (Linear Probability Model)

	(1)	(2)	(3)
variables	new_prod	new_prod	new_prod
market experience (t-1)	0.287***	0.278***	0.233***
	(0.024)	(0.024)	(0.023)
size (t-1), log	-0.001	-0.001	0.002
	(0.001)	(0.001)	(0.005)
Nber of exported products (t-1)	0.001***	0.001***	0.001***
	(0.000)	(0.000)	(0.000)
Nber of export destinations (t-1)	-0.000	0.000	0.001
	(0.001)	(0.001)	(0.001)
GDP/capita (log)		0.002***	0.001
		(0.001)	(0.000)
distance (log)		-0.015***	0.002
		(0.002)	(0.003)
Nber of exporters, same market (t-1)			0.002***
			(0.000)
size (t-1) x log distance			-0.000
			(0.001)
Observations	53'235	46'406	46'406
R-squared	0.158	0.167	0.190

Product (HS 2-digit) and time fixed effects are included in all specifications but are not shown. Errors are clustered by product. Robust standard errors in parentheses. Significance levels *** p<0.01, ** p<0.05, * p<0.1.

The results suggest that a previous experience in market *j* has a positive and statistically significant effect on the number of new products. Exporters with previous experience in market *j* are 23% to 29% more likely to introduce a new product in that market than exporters without experience. Exporter size has a positive effect on the number of new products introduced but only in our last specification. The effect is small and not statistically significant.

Interestingly, exporters selling several products abroad are more likely to introduce a new product. The effect is positive and significant although very small. Multi-products exporters are probably among the most productive firms and are thus more likely to be able to afford the introduction of another product. In addition, having experience in the sale process and management of a product make it probably easier to introduce another product. However, exporting to several destinations does not improve the chances of introducing a new product. The effect is null and not significant, which could indicate that it is potentially easier to introduce another product for exporters already selling multiple products than for those serving multiple markets.

As for the demand-side determinants, as anticipated, the distance to the market has a negative effect on the probability of introducing a new product. Additionally, the probability of exporting a new product to a given market seems to be larger for markets with a higher GDP per capita. This could reflect the fact that richer countries may be perceived as more profitable and therefore attract more exporters. However, both effects (i.e. distance and GDP/capita) disappear once we control for the information spillovers and the interaction term.

As for the information spillovers, the results suggest that the probability of introducing a new product is higher in markets where other Malian exporters are already doing business. The presence of other Malian exporters in a market may be a signal of profitability and can be useful to learn about demand conditions. Finally, the effect of the interaction term between distance and size is not significant and close to zero, thus suggesting that transportation costs represent a barrier for any exporter, regardless of its size.

The results show that distance and especially market experience have the largest effects on the probability of introducing a new product. Previous experience in a given market allows exporters to better understand consumers in that market, the competition and business environment. This should not come as a surprise as acquiring such information is essential to assess product demand, profitability and business opportunities in a given market. Transport costs remain an important constraint for product diversification as it negatively affects the competitiveness of exporters in foreign markets.

5.2. Market diversification

Having analyzed the determinants of "product diversification", we now turn to "market diversification" and evaluate the effect of various factors on the probability of incumbent exporters venturing into a new market.[33] The probability of firm *i* to serve a new market with product *p* in time *t* is given by:

$$Prob\ (NewMkt = 1)_{ipt} = \beta_1 FirmCs_{it} + \beta_2 ProductCs_{ipt} + \beta_3 Controls_{pt-1} + \epsilon_{ipt}$$

where *NewMkt* is a dummy that equals one if firm *i* serves a new market in *t* with product *p* (conditional on product *p* being exported) and zero otherwise. Like in the previous section, we include exporter size, as well as the number of products exported by firm *i* and the number of markets it serves.

To account for firm's product experience, we include a dummy that takes the value of one if the product was already exported by firm *i* in *t-1*, and zero otherwise. To control for the product type, we add two dummies to distinguish between differentiated and homogeneous goods using Rauch classification.[34] 'Differentiated goods' represents the reference category. We also include the change in world imports of product *p* in *t* to account for a change in demand conditions. To assess the effect of export programs, we include a dummy that equals one if the good is eligible for any government or donors support program.[35] To take into account the role of information spillover effects, we add the number of firms that exported the same product *p* in *t-1*.

Table 3 reports the results of the estimation. The first column refers to the base line specification and includes only firm characteristics. The second column includes market characteristics. The last specification includes other controls such as the proxy for the information spillovers and two interaction terms: the first one assesses whether the effect of support programs varies with exporter

[33] Firms can break into a new market with an existing or a new product.
[34] Rauch classification distinguishes among differentiated, homogeneous and referenced price goods. In this study, we consider homogeneous and referenced price goods as a single category.
[35] The products included in a support program (i.e. "Integrated Initiatives for Economic Growth in Mali"- USAID and the "Agricultural Competitiveness and Diversification Project" -Malian Government assisted by World Bank) are: bananas, mangoes, fish, sesame, onions/shallots, papaya, potatoes, tomatoes, milk, shea nuts, millet, sorghum and rice. We exclude livestock due to the changes in the statistical recording that have been applied in the last years in this category.

size, while the second captures whether the effect of product experience varies with the type of good. The technology, skills, and capital requirements associated with the production of a differentiated good are presumably harder to meet. We therefore expect that experience in the production and distribution of a differentiated (or sophisticated good) would play a bigger role than in the case of a homogenous good. Product and time fixed effects are included in all specifications.

Table 3: Probability to break into a new market (Linear Probability Model)

	(1)	(2)	(3)
variables	new_mkt	new_mkt	new_mkt
product experience (t-1)	0.119***	0.105**	0.113**
	(0.038)	(0.043)	(0.043)
size(t-1), log	-0.015**	-0.016**	-0.015*
	(0.007)	(0.008)	(0.008)
Nber of exported products (t-1)	-0.008***	-0.008***	-0.008***
	(0.001)	(0.001)	(0.001)
Nber of export destinations (t-1)	0.010**	0.010**	0.011**
	(0.004)	(0.005)	(0.004)
homogeneous good		0.019	0.062
		(0.042)	(0.043)
support program		0.179**	0.179
		(0.071)	(0.180)
demand growth		0.027	0.019
		(0.034)	(0.034)
Nber of exporters, same product (t-1)			0.010***
			(0.003)
product exp. * homo. good			-0.060**
			(0.028)
size (t-1) * program			-0.003
			(0.027)
Observations	2'780	2'481	2'481
R-squared	0.471	0.477	0.480

Product (HS 2-digit) and time fixed effects are included in all specifications but are not shown. Errors are clustered by product. Robust standard errors in parentheses. Significance levels *** p<0.01, ** p<0.05, * p<0.1.

The results suggest that product experience matters for market diversification. Exporters with a previous experience in selling product *p* are more likely to break into a new market. Indeed, it is reasonable to find that exporters will venture into new markets with products that were successfully exported elsewhere.

The effect of exporter's size is negative in all specifications and significant. This indicates that exporters with the largest sales in the previous year would tend to penetrate fewer markets. Such result could be reflective of the exporters' expansion strategy, as some exporters may prefer to consolidate their current market position before diversifying further.

As for the effect of the number of exported products on the probability to serve a new market, it is

negative and statistically significant, although small. This suggests that it is more difficult to diversify into new markets for multi-product exporters than for exporters with a single product. Again, multi-product exporters may prefer to consolidate their position before entering into new markets. In contrast, the number of markets that a firm served has a positive effect on the probability of entering a new market. Multi-market exporters have acquired a significant knowledge regarding customs procedures, transports networks and clients needs. They can better assess a market opportunity and probably are more willing to explore a new market than exporters that are focused only on one destination.

As for the product characteristics, the existence of a support program has a positive and statistically significant effect on the probability of exploring a new market. However, its effect disappears once we include the information variable and the interaction terms. It is worth mentioning that there is a potential endogeneity problem affecting the interpretation of this result. In other words we cannot establish the direction of the effect. It could be that the observed export growth is a consequence of the support program, or that products selected to be supported were precisely those that were expanding.

Finally the results suggest that information spillovers have a positive and statistically significant effect on the probability to serve a new market. The fact that other Malian firms sell the same product abroad could push exporter *i* to find new market opportunities. At the same time exporters could learn from their competitors about the profitability of certain markets before deciding to explore these opportunities. As for the interaction terms, only the interaction between the product experience and the dummy for homogeneous goods is statistically significant and indicates that the effect of product experience on the probability of exporting to a new market is lower for firms exporting a homogeneous good. This is consistent with our predictions that experience matters more in the case of differentiated goods.

Concluding, our analysis of the determinants of market diversification among Malian exporters reveals that exporters benefiting from previous product experience or selling a product promoted by the government or donors have the highest probability to enter a new market. This again shows the importance of product know-how, information on product standards, demand tastes, and overall familiarity with the export activity. With respect to the effect of the support program on promoting market diversification while we find a positive association, we cannot establish whether the probability of entering a new market is larger because of the success of the support program or because the product in question was selected on account of its performance (i.e. geographical expansion). Furthermore, this effect vanishes when we control for the information variable and the interaction terms.

5.3. Survival

Studies at the product and firm level (see for instance Besedes and Prusa, 2006 and Cadot et al., 2010) have shown that export survival is especially low in developing countries, and can be a key constraint to overall exports growth and diversification. Malian exporters are no exception. Half of new exporters exit the market after one year and 21% exit after two years, indicating that survival beyond the first years is difficult. Given the short time coverage of our dataset and the importance of survival for new exporters, we focus on the impact of potential factors affecting the survival of exporters at the beginning of their activity. More specifically, we estimate the effect of firm, product and market characteristics on the probability of new exporters to survive more than one year. This probability is given by:

$$\mathrm{P}(survival_{ipjt} = 1) = \beta_1 FirmCs_{it} + \beta_2 ProductCs_{pt} + \beta_3 MarketCs_{jt} + \beta_4 Controls_{pjt} + \epsilon_{ijpt}$$

Where the dependent variable equals 1 if firm *i* exported product *p* to market *j* in *t* for the second time ($i.e.\ exports_{ipjt} = 1,\ exports_{ipjt-1} = 1\ and\ exports_{ipjt-2} = 0$), and zero otherwise. To account for exporter, product and market characteristics we include the same variables as in the previous sections. The baseline results are presented in column 1 and 2 of Table 4. In column 3 we control for information spillovers by including the number of Malian exporters selling the same product *p* to market *j* in addition to the two information variables used in previous sections. Finally, we add three interaction terms: one to assess whether the effect of the support program varies with the exporter size, one to evaluate the joint effect of exporter size and distance, and another one to evaluate whether the effect of product experience varies with the type of product.

Table 4: Exporters survival (Linear Probability Model)

	(1)	(2)	(3)
variables	survival	survival	survival
market experience (t-1)	0.013***	0.012***	0.012***
	(0.002)	(0.002)	(0.002)
product experience (t-1)	0.015	0.019	0.014
	(0.009)	(0.013)	(0.010)
size(t-1), log	-0.000**	-0.000	0.000
	(0.000)	(0.000)	(0.000)
Nber of exported products (t-1)	-0.003	-0.002	-0.001
	(0.002)	(0.002)	(0.001)
Nber of export destinations (t-1)	-0.003	-0.003	-0.003
	(0.003)	(0.003)	(0.003)
homogeneous good		0.049	-0.028
		(0.079)	(0.085)
support program		0.167***	0.164**
		(0.062)	(0.081)
demand growth		-0.007	-0.013
		(0.029)	(0.031)
GDP/capita (log)		0.014	0.007
		(0.014)	(0.014)
distance (log)		-0.052**	-0.042*
		(0.021)	(0.024)
Nber of exporters, same product (t-1)			-0.001
			(0.004)
Nber of exporters, same market (t-1)			0.000
			(0.000)
Nber of exporters, same product and market (t-1)			0.023***
			(0.007)
prod_exp. x homo. good			0.050**
			(0.022)
size (t-1) x program			-0.000
			(0.000)
size (t-1) x log distance			-0.000
			(0.000)

Observations	2,097	1,841	1,841
R-squared	0.275	0.287	0.297

Product (HS 2-digit) and time fixed effects are included in all specifications but are not shown. Errors are clustered by product. Robust standard errors in parentheses. Significance levels *** p<0.01, ** p<0.05, * p<0.1.

The results suggest that the survival of new trade relationships is affected by market experience. Exporters with solid market experience (measured by the number of times this market was served before)[36] have a higher probability to survive beyond their first year. The effect of product experience (measured by the number of times this product was exported before) on survival is positive and statistically significant but only in the case of homogenous goods (captured by the interaction term). This is probably because competition in homogeneous goods is fiercer and experienced exporters possess an advantage in terms of know-how (i.e. demand requirements and product standards) and reputation with respect to inexperienced exporters. Exporter size seems not to have an effect on the probability to survive beyond the first year. As for firms exporting several products, they face a higher probability to exit market *j* with product *p* after one year. A similar effect is found in the cases of exporters selling to multiple markets. But in both cases, the effect is not statistical significant and its magnitude is very small.

Regarding product characteristics, only the effect of a support program is positive and significant. However, as discussed earlier, the interpretation of this result should be very careful as this positive association does not imply any causality. We cannot establish whether the success in terms of survival among the products promoted by the government and donors is a consequence of the support program or a cause. In fact, it is reasonable to think that the products supported by the Government and donors programs were selected precisely because of their performance. With respect to the variables accounting for market characteristics, only distance has a statistically significant effect on the survival of young exporters and its effect is negative (i.e. survival is harder in more distant markets).

With respect to the variables proxiyng for information spillovers, only the number of firms exporting the same product to the same market has a positive effect on survival. A larger number of firms in a market may be seen as sign of profitability and thus attract more exporters. In turn, the newcomers may benefit from the reputation established by his peers and their know-how to improve their chances of survival.

In conclusion, in this section we showed that government support, distance, and product experience especially in the case of homogeneous goods are the determinants with the largest effects on the survival of young exporters. However, as discussed earlier, the variable capturing government support is potentially endogenous as the good performance of the products selected for the program may have influenced the choice of the government or donors when designing its program.[37]

[36] For this exercise, we measured market and product experience by the number of times a market was served and the number of times a product was exported in *t-1*, instead of a dummy to take into account the degree of export experience.

[37] To ensure that our results are not driven by gold and cotton exports, we estimate as a robustness check all regressions but excluding gold and cotton exporters. The results of estimations concerning the probability of exporting a new product, a new market and surviving are almost the same. This not surprising, as the dependent variable in each of these three estimations is not based on export values, but on a binary value (i.e. zero or one). All the robustness estimations are available under request.

6. Conclusion

Mali's export performance has been little studied so far, although the country presents one of the highest export concentrations in Sub-Saharan Africa. Over-dependence on gold and cotton threatens the country's long-run growth prospects and urgently calls for further diversification. This paper sheds new light on Mali's exporter dynamics, sources of diversification, and on the determinants of firm diversification.

At the aggregate level, we decompose trade into an extensive and intensive margin for the period 1996-2008 and find that the main sources of diversification have been the exports to new markets and the expansion of non-traditional exports (i.e. exports that did not exist in 2000 or that had small export shares in Mali's export portfolio). Overall, this timid process of diversification remains largely insufficient to rebalance the country's export portfolio. At the firm-level, we found that incumbent exporters were the main players behind both margins and that churning in terms of exporters, product, and markets (i.e. exporter-product, exporter-market, exporter-product-market level) was also significant, which could partially explain the aggregate patterns observed in Mali.

Indeed, diversification is challenging because exporting is itself a difficult, risky and complex activity. It depends on the ability of exporters to penetrate new markets, introduce new products, but also on their capacity to durably maintain these business relationships. We analyzed the impact of supply-side and demand-side determinants on the probability of (i) introducing a new product and (ii) breaking into a new market. Our results suggest that market experience is a critical driver of product diversification: an exporter will find it easier to introduce a new product in a country where he is already present, knows the consumer tastes, business environment, distribution' networks and customs practices. On the other hand, we find that transport costs constitute a major obstacle to the introduction of a new product as it reduces the competitiveness of exporters in foreign markets. These costs are particularly high, and constraining, in the case of a landlocked country like Mali, which points to the importance of trade facilitation and targeted infrastructure investments

As for the determinants of market diversification, our analysis suggests that variables with the largest effect on the probability to break into a new market are product experience, as well as the existence of a support program. Both have a positive effect on the probability of exporting to a new market. In the case of product experience, exporters will found easier to venture into new markets with products that were successfully exported elsewhere. As for the support program variable, this is potentially endogenous variable and we cannot establish the causality of its effect. In fact it could be that the products supported by the program were selected by the government and donors precisely because of their good performance.

Finally, this study looks at the survival among new exporters. This is an important issue as new export flow can have a significant impact on export growth and diversification only if they manage to survive and expand. However, we found that in Mali, like in many other developing countries, survival among new exporters is very low. One every two exporters exits the market after just one year. We examine the effect of firm, market and product characteristics on the probability of surviving after one year of activity. We find that product experience has a positive effect on the probability of surviving beyond the first year, but only in the case of homogeneous goods. These products are likely to face fiercer competition than heterogeneous products. In this context, having an expertise and established reputation in a market are very likely to help exporters to retain clients, attract new ones and thus increase their chances of survival. Market experience has also a positive effect on the probability of surviving beyond the first year. Such experience helps exporters to acquire information on the business

environment, demand tastes, profitability and to better assess the risks regarding a business opportunity. The distance from the market has also a negative effect on the survival of young exporters. Serving far away markets incur larger transport costs and probably also show a higher level of delivery uncertainty (i.e. the exporter cannot control the delivery of the merchandise, quality, storage, etc). Finally, exporters selling a product under a support program face a higher survival probability beyond the first year of activity. But again, since this variable is potentially endogenous, we cannot determine the direction of the effect.

Our findings have important policy implications. First, they highlight the effects of information asymmetries which could be reduced by improving the linkages between exporters and the markets. The results suggest that the information acquired in a market or with a product through experience is one of the main factors helping exporters to diversify and survive. During the exporting process, exporters learn about product standards, transportation networks, customs regulations, clients' requirements and about business profitability. On the other hand, buyers learn about the quality of the product and the ability of an exporter to deliver. Export promotion agencies could play a role in reducing information asymmetries between exporters and markets. Recent evidence from 103 countries (Lederman, Olarreaga and Payton, 2010) suggests that export promotion agencies have positive and statistically significant effect on exports. The creation of a promotion agency has been announced in Mali, but no timeline exists for its implementation.

Second, transport costs appear as a key determinant of diversification and survival. Market connectivity could be improved through improved and faster access to ports not only by supplying the necessary infrastructure, but also by cutting on red tape and shortening the time associated with customs procedures. This is particularly critical in the case of agricultural products, which have a limited life cycle and are quickly perishable.

Third, the qualitative data collected among Malian exporters suggest that access to credit is considered a major constraint, especially for agribusiness because of the lag between the moment the capital to start operating is required and the moment exporters receive an order from a client. Developing financial products more adapted to the specific needs of exporters could help them to consolidate their market position, and for the most productive ones to expand.

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Appendix 1: Multi-product and multi-market exporters

Table 6a: Share of exports by type of firm (average over 2005-2008)

	number of markets						
number of products	1	2	3	4	+5	+10	**Total**
1	2.18	2.08	0.47	0.05	0.41	0.22	5.41
2	0.65	1.55	1.32	9.34	0.82	0.35	14.03
3	1.3	0.32	0.17	0.09	0.12	0.45	2.45
4	0.14	0.13	0.08	7.34	1.36	0.00	9.05
+5	0.38	17.77	2.99	6.96	7.21	0.07	35.38
+10	0.07	0.36	3.94	10.65	11.55	7.09	33.66
Total	4.72	22.21	8.97	34.43	21.47	8.18	100

Table 6b: Share of exporters by type of firm (average over 2005-2008)

	number of markets						
number of products	1	2	3	4	+5	+10	**Total**
1	34.47	5.58	1.42	0.5	0.38	0.16	42.51
2	8.56	6.29	2.29	0.98	0.82	0.15	19.09
3	4.28	2.62	2.25	0.77	0.66	0.26	10.84
4	1.73	1.85	1.16	0.67	0.86	0.00	6.27
+5	2.64	2.65	2.68	1.87	2.46	0.16	12.46
+10	0.57	0.98	1.12	1.49	3.62	1.05	8.83
Total	52.25	19.97	10.92	6.28	8.8	1.78	100

Appendix 2: Mali's trade by type of firm

Appendix 3: Firm-product, firm-market, firm-product-market combinations