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Vladimir Chlouba
Connecticut College

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Vladimir Chlouba
Connecticut College

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Abstract: *This work examines the impact of German sources of capital on the Namibian economy. Two sets of equations are tested. The first set tests the effect that German development assistance and German capital goods have had on domestic GDP. The second set tests the effect of German development assistance on the Namibian government's capital formation outlays. The German independent variables are subsequently compared to global sources of capital in order to determine whether the German sources demonstrate a comparatively higher significance. Furthermore, the effects of official development assistance are disaggregated by type to test for aid's fungibility. This analysis enables us not only to determine the direct impact of German sources of capital on the Namibian economy but also the extent to which official development assistance impacts the government's investment behavior. We find that German development assistance has practically no effect on Namibian GDP. However, German development aid does have a statistically significant effect on the Namibian government's level of annual expenditure on capital formation. Our results lead to the conclusion that German development aid has the potential, through public investment, to exert a positive influence over the Namibian economy. Further research will need to explore the conditions under which this potential can be fulfilled.*

INTRODUCTION

The southern African country of Namibia was once a colony of the German Empire and the history of the dire exploitation that was German colonialism in Namibia has been thoroughly documented. As a result of the famous "Scramble for Africa," the Germans sought to control Namibia in a struggle that ended with several cases of genocide.[1] Today, Germany is Namibia's second greatest donor of development aid and the countries' relations, at least on the official level, are said to be flourishing.[2] In 1989, the German Bundestag enacted a resolution that underlined Germany's historical and political responsibility towards Namibia. After 1990, the countries' relationship has been solidified by a number of high-profile visits. In 1995, German chancellor Helmut Kohl paid the former colony a visit and in March 1998, German president Roman Herzog followed suit. The tide of official visits from Germany continued with the president of the Bundestag Wolfgang Thierse and foreign minister Joschka Fischer, both of which visited Namibia in 2003. Namibian officials, if the number of official visits can be interpreted as a reliable indicator, accorded to the bilateral relationship equally high importance. Namibian president Sam Nujoma visited Germany three times (1996, 2000, and 2002), Namibian prime ministers did so on four occasions (Geingob: 1997,

[1] See, for instance, JONASSOHN, Kurt & Karin SOLVEIG BJÖRNSON. *Genocide and Gross Human Rights Violations in: In Comparative Perspective.* New Brunswick: Transaction Publishers, 1998.

[2] Namibia. *Federal Foreign Office* [online], 2016. [cit. 2016-01-01]. Available at: http://www.auswaertiges-amt.de/EN/Aussenpolitik/Laender/Laenderinfos/01-Nodes/Namibia_node.html

2000, and 2000, Angula: 2011).[3] To list the other official visits would no doubt underscore the point that the German-Namibian political relationship enjoys careful attention on both sides but it would also reach beyond the scope of this paper. However, let us mention that when it comes to the delegations accompanying official visits, the economic ministers (trade and industry, tourism, economic cooperation and development) usually occupy the front seats. Both countries seem to be interested in deepening of their economic ties and exchanges of visits by officials responsible for economic policy continued as recently as July 2015. This illustrates the fact that the German-Namibian ties have, and, as will be evidenced later, have always had, an important economic dimension. In 2014, bilateral trade between Germany and Namibia amounted to approximately 274 million euros. In aggregate terms, German foreign direct investment in Namibia nears 90 million euros.[4] An investment promotion and protection agreement as well as a double taxation accord are in force. Official development assistance (ODA) has, most prominently after 1990, played a crucial role in the governments' relationship. The German foreign office's official data claim that over 800 million euros have been provided to Namibia for the purpose of development cooperation since 1990. This represents the *highest* per capita rate paid by Germany to an African country.[5] Importantly, German development aid to Namibia has been devoted to a number of areas; resources are being utilized in construction of educational and cultural facilities, too. Currently, three priorities have been identified: management of natural resources, transport, and sustainable economic development.[6]

Despite voluminous literature on the topic, a consensus regarding development aid's effectiveness has not been reached. In the case of the German-Namibian relationship however, such consensus is unavailable not necessarily because academics present differing results, but rather because too few studies on the topic of German development aid to Namibia have been written. Even though this is partially explained by the fact that Namibia remains a young country,[7] the degree to which this relationship remains underresearched is striking. Namibia's data have by now reached both the necessary volume as well as considerable reliability and their analysis is long overdue.

Therefore, this study will consider the extent to which German development aid exerts influence on the Namibian economy. However, we will focus on German sources of capital in a broader sense of the word and the analysis of German official development assistance will be supplemented by that of German exports of capital goods to Namibia or, conversely, Namibian imports of German capital goods. An adjusted Cobb-Douglas production function will be employed to quantify the effect of the two aforementioned variables (German ODA and German capital goods) on Namibia's GDP. To provide a comparative measure of

[3] KATJAVIVI, Peter H. *Namibia's bilateral relations with Germany: A crucial relationship* in BÖSL, Anton, André DU PISANI a Dennis U. ZAIRE. *Namibia's Foreign Relations: Historic contexts, current dimensions, and perspectives for the 21st century*. Windhoek, Namibia: Macmillan Education Namibia, 2014. ISBN 9789991626109, pp. 143 - 145

[4] Namibia. *Federal Foreign Office* [online], 2016. [cit. 2016-01-01]. Available at: http://www.auswaertiges-amt.de/EN/Aussenpolitik/Laender/Laenderinfos/01-Nodes/Namibia_node.html

[5] ibid., p. 1

[6] ibid., p. 1

[7] In 2015, Namibia celebrated its 25th Independence Day.

the relative importance of German sources of capital, an analogical analysis will be conducted for aggregate (world) ODA to Namibia and aggregate imports of capital goods. Furthermore, official development assistance will be disaggregated by type to test for aid's fungibility. Subsequently, we will develop a simple model for the Namibian government's annual outlays towards capital formation to test the role of German ODA in its determination. The comparison between the effect exerted by ODA on the entire economy and that exerted on the government's spending behavior will not only enhance our understanding of German ODA's various effects, it will also shed some light on a potential channel (government investment expenditure) through which development aid operates.

This paper is organized in the following fashion: first, two sections of literature review follow the indtroduction, each of which focuses on a different aspect concerning the provision of German capital to the Namibian economy. Specifically, we will review the general scholarly debate surrounding the topic of official development assistance as well as literature concerning the relationship between official development assistance and government expenditure. Second, the importance of official development assistence in the bilateral relationship between Germany and Namibia is elucidated. Third, a brief overview of the Namibian economy is presented, so that the reader can make sense of the reasoning employed and the conclusions reached later in the paper. Fourth, the theoretical models used in this paper will be elucidated and potential limits of the data used for the purpose of this study will be introduced. Lastly, we will discuss the results and conclude the paper by reiterating the important findings and providing suggestions for future research.

Literature Review

Though this study is primarily concerned with the impact of German sources of capital on the Namibian economy, it is imperative that we see our research from a broader perspective. Namely, we attempt to diversify and broaden previous literature by adding new variables to established models as well as by suggesting a simplified model of our own. Therefore, this section clarifies the novelty of our research with respect to previously published literature.

A General Overview of the Foreign Aid Debate

The debate over development aid is probably as old as development assistance itself. The literature on foreign aid can, for the sake of simplicity, be divided in three distinct parts. First, a considerable amount of research has been devoted to the proper definition and understanding of foreign development aid, which has proven particularly important for further research objectives. Second, a great amount of debate has taken place with respect to foreign development aid's effects on the receiving countries and, subsequently, aid's effectiveness. Lastly, scholars have attempted to identify the factors that determine who gives to whom.

A classical understanding of the role that foreign development aid performs in a developing country's economy was suggested by Chenery and Strout who put forth the notion that aid is best understood as a low-cost source of capital that improves domestic savings and investment, and thus represents an attractive proposition for developing countries.[8] Chenery and Strout's

[8] CHENERY, H. B. and STROUT, A. (1966) Foreign Assistance and Economic Development, *American Economic Review*, vol. 56.

theoretical framework is an instance of a relatively straightforward and simple model that marks the beginning of the academic debate on foreign aid.

Another simple model that gained currency in the early days of foreign aid research is the Harrod-Domar model which assumes a stable linear relationship between growth and investment in physical capital.[9] The assumption that all aid is invested leads to a straightforward estimation of how much aid is needed to achieve a particular level of economic growth. The empirical studies that followed in the footsteps of these early models thus focused on the extent to which aid is capable of boosting savings and investment. A number of seminal studies by Papanek may serve as examples.[10]

The empirical work described above, paradoxically, showed that aid tends to increase savings but not necessarily in the simple and linear fashion suggested by Harrod-Domar. The empirical studies of this generation, one may dare to conclude, refuted their own theoretical underpinings by evidencing that an important portion of aid is consumed rather than invested.

Subsequent studies that saw the light of day largely during the 1980s therefore attempted to present an alternative understanding of foreign aid. Specifically, one line of thought assumed that aid could exert influence on economic growth through investment. In that sense, focus on capital accumulation was retained. Hansen and Tarp, in their study of the foreign aid literature, conclude that studies subscribing to this line of thought were able to produce results that were on the one hand relatively robust, yet still theoretically conflicting.[11] Namely, a positive relationship between aid and investment was corroborated while clear evidence establishing a link between savings and economic growth over time was missing.

A truly novel challenge to the aforementioned studies thus came from Easterly, who argues that growth is less related to physical capital investment than is often assumed.[12] This argument proves relatively weak in the case of Namibia but Easterly's critique undoubtedly ushered in a new perspective on the nature of development aid.

Jepma presents an impressive overview of foreign aid literature that leads the author to a more complicated conclusion when it comes to the nature of development aid. His work illustrates that the understanding of aid as a decisively positive independent variable that exerts causal effects on the receiving country's economy

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[9] HARROD, Roy F. An Essay in Dynamic Theory. *The Economic Journal*. 1939, **49**(193), 14-. DOI: 10.2307/2225181. ISSN 00130133. Available at:http://www.jstor.org/stable/10.2307/2225181?origin=crossref

DOMAR, Evsey D. Capital Expansion, Rate of Growth, and Employment. *Econometrica*. 1946, **14**(2), 137-. DOI: 10.2307/1905364. ISSN 00129682. Available at: http://www.jstor.org/stable/1905364?origin=crossref

[10] PAPANEK, Gustav F. (1972). 'The Effect of Aid and Other Resource Transfers on Savings and Growth in Less Developed Countries'. *Economic Journal*, 82 (327), pp. 935–50.

PAPANEK, Gustav F. (1973). 'Aid, Foreign Private Investment, Savings, and Growth in Less Developed Countries'. *Journal of Political Economy*, 81 (1), pp. 120–30.

[11] HANSEN, H., and F. TARP (2000). 'Aid Effectiveness Disputed'. *Journal of International Development*, 12 (3), pp. 375–98.

[12] EASTERLY, W. (1999). 'The Ghost of Financing Gap: Testing the Growth Model Used in the International Financial Institutions'. *Journal of Development Economics*, 60 (2), pp. 423–38.

EASTERLY, W. (2003). 'Can Foreign Aid Buy Growth?'. *Journal of Economic Perspectives*, 17 (3), pp. 23–48.

is incomplete at best. In fact, as Jepma demonstrates, simplified empirical methodology cannot explain whether a country suffers economic hardship because of mismanaged sources of cheap capital or whether a country receives this form of augmentation precisely because of economic underperformance.

Thus, the interaction between foreign aid provision and economic development is one where the exact causal links cannot be identified easily.[13] This problem was raised by scholars such as Mosley et al. at the beginning of the 1990s.[14]

It was at the beginning of the last decade of the twentieth century that scholars finally reflected on the palpable weaknesses of past theory and introduced models that take into account the potential non-linear relationship between foreign aid and economic growth as well as the endogeneity of aid. A truly influential paper by Burnside and Dollar (Easterly claims that it has, in a self-fulfilling prophetic manner, influenced actual aid policies)[15] suggests that aid can work as long as recipient states pursue "good policies."[16] Rajan and Subramanian write that the standard Cobb-Douglas production function as well as assumptions that aid mainly augments investment in physical capital while having little effect on productivity can be useful but our expectations regarding aid's impact on growth should be modest.[17] Dalgaard and Erickson, who employ an augmented Solow-Swan growth model, agree that expectations regarding foreing aid's potency have simply been too high.[18]

The most recent studies employ techniques such as dynamic panel GMM methods which are supposed to a) account for unit-level fixed effects b) incorporate internal methods for dealing with endogenous regressors and c) avoid the bias of standard panel estimators in dynamic settings.[19]

Recent literature has also suggested that the "black box" of political economy needs to be opened in order to enrich the debate on the nature and dynamics of foreign aid.[20] The view that quantitative analyses have to be complemented by country-specific observations from the field of political economy is one that is shared by the author of this study.

[13] JEPMA, Catrinus J. *On the Effectiveness of Development Aid*. World Bank, Unpublished. 1997. Discussed in ALESINA, Alberto a David DOLLAR. *Journal of Economic Growth* [online]. 2000, vol. 5, issue 1, pp. 33-63 [cit. 2015-04-12]. DOI: 10.1023/a:1009874203400.

[14] MOSLEY, P., J. HUDSON, and S. HORRELL (1992). 'Aid, the Public Sector and the Market in Less Developed Countries: A Return to the Scene of the Crime'. *Journal of International Development*, 4 (2), pp. 139–50.

[15] EASTERLY, W. (2003). 'Can Foreign Aid Buy Growth?'. *Journal of Economic Perspectives*, 17 (3), pp. 23–48.

[16] BURNSIDE, Craig., and David DOLLAR (2000). 'Aid, Policies, and Growth'. *American Economic Review*, 90 (4), pp. 847–68.

[17] RAJAN, Raghuram G., and Arvind SUBRAMANIAN. Aid and Growth: What Does the Cross-Country Evidence Really Show? *The Review of Economics and Statistics*, 90 (4). 2008, pp. 643–65.

[18] DALGAARD, Carl-Johan and Lennart ERICKSON. Reasonable Expectations and the First Millennium Development Goal: How Much Can Aid Achieve? *World Development* [online]. 2009, **37**(7), 1170-1181 [cit. 2016-03-08]. DOI: 10.1016/j.worlddev.2008.11.003. ISSN 0305750x. Available at: http://linkinghub.elsevier.com/retrieve/pii/S0305750X08003173

[19] ARNDT, C., S. JONES, and F. TARP (2007). 'Aid and Development: The Mozambican Case'. In S. Lahiri (ed.), *Frontiers of Economics and Globalization: Theory and Practice of Foreign Aid*. Amsterdam: Elsevier, p. 4

[20] BOURGUIGNON, F., and M. SUNDBERG (2007). 'Aid Effectiveness: Opening the Black Box'. *American Economic Review*, 97 (2), pp. 316–21.

Let us consider the question of whether or not development aid has been an effective strategy for boosting developing countries‘ growth. In 1987, Paul Mosley ambitiously summarized decades of empirical resarch by concluding that even though instances of aid effectiveness on the microeconomic level are not necessarily rare, an aggregate positive effect of aid on the macroeconomic level is hard to identify.[21] He termed his observation the micro-macro paradox, which challenged the work of such researchers as Papenek,[22] whose work had long dominated the field. Articles that attest to the failure of development aid abound. Boone has reached the conclusion that foreign aid's effects on growth and investment are negligible, controlling for the endogeneity of aid flows.[23] In an already mentioned contribution, Burnside and Dollar examine the interaction between aid and policies that promote growth, arguably in the neoclassical framework.[24] In their specification of the growth equation, Burnside and Dollar incorporate a wide range of institutional and policy variables that have been claimed to explain growth performance of poor countries. The OLS estimation of that specification (which used panel data for forty low-income countries over six-year periods from the beginning of the 1970s to the beginning of the 1990s) found that institutional quality, inflation, and trade openess were the most important variables affecting growth. The effect of aid, our main interest, was found insignificant for countries with average policies. Estimates of the effect of aid for countries with good policies were invariably positive. In a more recent contribution, Rajan and Subramanian write that foreign aid's effects on receiving countries can hardly be deemed systematic.[25] Finally, the Zambian economist Dambisa Moyo argues for a complete cessation of development aid provision.[26] Recognizing that proving solid positive effects on the receiving economies may not be a viable strategy, numerous scholars have attempted to reframe the debate. Albert O. Hirschman has cautioned before the so-called perversity thesis which claims that development aid creates ample opportunities for moral hazard when a receiving country delays the necessary reforms precisely because it can afford to do so thanks to capital injections from abroad.[27] Herbst, opposing Hirschman's view, has provided extensive evidence in this respect, presenting examples such as poor revenue

[21] MOSLEY, P. (1987). *Overseas Aid: Its Defence and Reform.* Brighton: Wheatshead Books.

[22] PAPANEK, Gustav F. (1972). 'The Effect of Aid and Other Resource Transfers on Savings and Growth in Less Developed Countries'. *Economic Journal*, 82 (327), pp. 935–50.

PAPANEK, Gustav F. (1973). 'Aid, Foreign Private Investment, Savings, and Growth in Less Developed Countries'. *Journal of Political Economy*, 81 (1), pp. 120–30.

[23] BOONE, P. *The Impact of Foreign Aid on Savings and Growth*. London School of Economics, mimeo. 1994.

BOONE, P. Politics and the Effectiveness of Foreign Aid. *European Economic Review 40*. 1996, pp. 289-329.

[24] TSIKATA, T. (1998). 'Aid Effectiveness – A Survey of the Recent Empirical Literature'. *International Monetary Fund Working Paper* 98/1, International Monetary Fund, p. 13

[25] RAJAN, Raghuram G., and Arvind SUBRAMANIAN. Aid and Growth: What Does the Cross-Country Evidence Really Show? *The Review of Economics and Statistics*, 90 (4). 2008, pp. 643–65.

[26] MOYO, Dambisa. *Dead Aid: Why Aid Is Not Working and How There Is a Better Way for Africa*. New York: Farrar, Straus and Giroux, 2009.

[27] HIRSCHMAN, Albert O. 1991. *The Rhetoric of Reaction: Perversity, Futility, Jeopardy.* Cambridge, Mass.:Belknap Press.

mobilization or infrastructure construction.[28] Goldsmith has embraced Hirschman's stance by suggesting that his "main concern is not national economic performance, the usual focus in the debate over the effectiveness of aid, but political performance."[29]

Lastly, literature has been devoted to the seminal question of who gives to whom. Donor motivation is related to our topic only tangentially and we will thus merely suggest the main fault lines that define the debate. One of these fault lines is of a remarkably normative undertone. This normative line of thought which suggests that it is the poorer countries that are on the receiving end (following Chenery and Strout's 1966 logic) has, however, not found much empirical support. Quite to the contrary, voluminous literature has shown that other factors such as colonial history and, or, strategic objectives take the place of the most important determinant.[30] In the case of the German-Namibian relationship, this proclivity is illustrated by Amavilah.[31]

The goal of the present study is not to introduce an entirely novel theoretical framework for studying the effects of German sources of capital on the Namibian economy. Rather, its ambition is to supplement the scholarship of the German-Namibian relationship with a quantitative analysis of previously unavailable data. The data pool has by now reached sufficient maturity and reliability and it is thus imperative that it be analyzed.

Foreign Aid and Public Investment

As has been illustrated in the course of the general review of the foreign aid debate presented above, scholars have found it difficult to reach a consensus on foreign aid's effects and effectiveness on the macro level. Apart from questions of methodology and data reliability, the matter at hand may also prove elusive because scholars have often focused on a relatively narrow spectrum of effects. Out study thus considers not only the effect of German aid on Namibian GPD but also its impact on the Namibian central government's public investment expenditure.

The impact of foreign aid inflows on government fiscal behavior is of crucial importance. First, it represents an important way in which foreign aid donors can influence the governments of developing countries as well as the policies that these governments pursue. Naturally, questions of sovereignty as well as ethics enter into the picture, but these are beyond the scope of our present study. Second, and this is particularly relevant in our case study, the fiscal behavior of the governments of recipient countries represents perhaps the most direct and indeed, most important, channel through which foreign aid influences the domestic economy. Lastly, in order to determine aid's effectivness, the issue of fungibility cannot be left unheeded.

Fungibility refers to aid's monetary nature which enables governments to use it, despite various control mechanisms, in the ways that they see most appropriate. For all these reasons, studying the impact of foreign aid on government expenditure in general

[28] HERBST, Jeffrey. *States and Power in Africa: Comparative Lessons in Authority and Control*. Princeton, N.J.: Princeton University Press, 2000. ISBN 06-910-1028-5.

[29] GOLDSMITH, Arthur A. Financial Aid and Statehood in Africa. *International Organization*. vol. 55, issue 1. DOI: 10.1162/002081801551432, p. 124

[30] MAIZELS, Alfred and Machiko K. NISSANKE. Motivations for Aid to Developing Countries. *World Development*. 1984,**12**(9), 879-900.

[31] AMAVILAH, Voxi H. German Aid and Trade versus Namibian GDP and Labour Productivity. *Applied Economics* [online]. 1998, vol. 30, issue 5, s. 689-695 [cit. 2015-04-12]. DOI: 10.1080/000368498325679.

and public investment in particular is likely to provide an additional perspective on the matter at hand. Two major questions can be entertained when it comes to governments' spending behavior and foreing aid. The first has already been foreshadowed and it pertains to aid's fungibility. The degree to which aid may induce the government to increase its consumption rather than investment is an important subject of enquiry.

Another question concerns the indirect effects that aid may exert on governments' behavior. For instance, voluminous literature has been produced that considers the degree to which governments' ability to mobilize domestic revenue decreases with increasing levels of foreign aid disbursements.[32] This is because aid merely substitutes domestic tax revenue. In this particular case, studies focused on aid's effects on economic growth may not detect any major influence despite the fact that aid does have important impact on the recipient country or, at least, its government.

Another question worth studying is that of *aid illusion*. This notion suggests that aid calculations disregard the fact that development projecs initially financed by foreign aid will subsequently require additional public investment due to expenditures on maintenance, etc. On the one hand, this fact is likely to be reflected in government expenditure. On the other hand, it may lead to a misunderstanding of the value that aid actually provides.[33]

Some of the most influential studies that have enriched the abovespecified debate are presented in a lucid manner by McGillivray and Morrissey.[34] Pack & Pack focused their study, which assesses the impact of foreign aid on various kinds of government expenditure, on Indonesia.[35] They find a clearly positive effect on developoment expenditure. In their 1993 paper however, Pack & Pack find that in the Dominican Republic, the impact of aid on development expenditure was slightly negative. Gupta, publishing in 1993 his study of India, finds that foreign aid impacts development expenditure in a positive manner.[36] Lastly, in an important 1998 study, Feyzioglu et al. considered data on fourteen least developed countries.[37] They find a positive impact of ODA on total government expenditure, development expenditure, and investment expenditure.

Even though the conclusion that foreign aid has a positive impact on development and investment expenditure is more or less supported by the studies summarized above, they, too, have undeniable limits. Above all the studies relying on cross-sectional data (such as that of Feyzioglu et al.) do not enable us to consider country-specific conditions which are likely to play an important role. Whereas the Feyzioglu et al. study relies on a methodological framework characterized by a system of linear expenditure equations derived from a utility maximization problem

[32] MCGILLIVRAY, M. and O. MORRISSEY (2001). *A Review of Evidence on the Fiscal Effects of Aid*. CREDIT Research Paper 01/13, University of Nottingham.

[33] MCGILLIVRAY, M. and O. MORRISSEY (2000). *A Review of Evidence on the Fiscal Effects of Aid*. CREDIT Research Paper 01/13, University of Nottingham.

[34] MCGILLIVRAY, M. and O. MORRISSEY (2001). *Aid Illusion and Public Sector Fiscal Behavior*. CREDIT Research Paper 00/9, University of Nottingham.

[35] PACK, H. and J.R. PACK (1990), 'Is Foreign Aid Fungible? The Case of Indonesia', *Economic Journal*, 100, 188-194.

[36] GUPTA, K. (1993), 'Sectoral Fungibility of Foreign Aid in India', mimeo, University of Alberta.

[37] FEYZIOGLU, T., V. SWAROOP and M. ZHU (1998), 'A Panel Data Analysis of the Fungibility of Foreign Aid', *World Bank Economic Review*, 12:1, 29-58.

(the utility function is maximized subject to a budget constraint), others (Pack & Pack) do not rely on any explicit theoretical framework.

A series of other studies have employed a different, arguably more complex, theoretical framework. This framework also relies on utility maximization but the utility function is defined as deviations of the studied variables from government targets, which are specified as the budgeted figures. In spite of this, literature of this second kind points in multiple directions. In fact, the most influential studies are divided about equally when it comes to the arithmetic sign of aid's impact on public investment. Franco-Rodriguez[38], McGillivray & Ahmed[39], and McGillivray & Ouattara[40] all find a negative effect of development aid on public investment. Franco-Rodriguez et al.[41], Khan & Hoshino,[42] and Heller[43] published studies that report the opposite finding. To complicate matters further, Iqbal, in his study of Pakistan, finds no impact of aid on government investment whatsoever.[44] Even though the above mentioned studies incorporated data on countries in Asia, Africa, and Latin America, no clear consensus seems to have emerged. This is arguably due to the fact that country-specific variables are likely to be of high importance.

Let us lastly mention two important studies that consider the effect of disaggregated aid. Mavrotas studied Uganda's data to determine the effect of project aid, programme aid, technical assistance, and food aid on dependent variables such as tax revenue, public investment, public consumption, and domestic borrowing.[45] Government investment was positively influenced by programme aid and technical assistance. Food aid and project aid had, on the other hand, a negative impact on public investment. In 2006, Mavrotas and Ouattara studied the case of Cote d'Ivoire to find out that aggregated aid and project aid had a

[38] FRANCO-RODRIGUEZ, S. (2000), 'Recent Advances in Fiscal Response Models with an Application to Costa Rica', *Journal of International Development*, 12:3, 429-442.

[39] MCGILLIVRAY, Mark a Akhter AHMED. Aid, Adjustment and Public Sector Fiscal Behaviour in the Philippines. *Journal of the Asia Pacific Economy* [online]. 1999, **4**(2), 381-391 [cit. 2016-03-09]. DOI: 10.1080/13547869908724687. ISSN 1354-7860. Available at: http://www.tandfonline.com/doi/abs/10.1080/13547869908724687

[40] MCGILLIVRAY, M. and B. OUATTARA (2005). Aid, Debt Burden and Government Fiscal Behaviour in Cote d'Ivoire. *Journal of African Economies*, 14(2), pp. 247-269.

[41] FRANCO-RODRIGUEZ, Susana, Mark MCGILLIVRAY and Oliver MORRISSEY. Aid and the Public Sector in Pakistan: Evidence with Endogenous Aid.*CREDIT Research Paper*. 1998, **98**(2). Available at:https://www.nottingham.ac.uk/credit/documents/papers/98-02.pdf

[42] KHAN, Haider Ali a Eiichi HOSHINO. Impact of Foreign Aid on the Fiscal Behavior of LDC Governments: Evidence with Endogenous Aid. *World Development*. 1992, **20**(10), 1481-1488. DOI: 10.1016/0305-750X(92)90068-7. ISSN 0305750x. Available at: http://linkinghub.elsevier.com/retrieve/pii/0305750X92900687

[43] HELLER, P.S. (1975), 'A Model of Public Fiscal Behaviour in Developing Countries: Aid, Investment and Taxation', *American Economic Review*, 65, 429-445.

[44] IQBAL, Zafar. Foreign Aid and the Public Sector: A Model of Fiscal Behaviour in Pakistan. *The Pakistan Development Review*. 1997, **36**(2), 115-129. Available at: http://www.jstor.org/stable/41260027

[45] MAVROTAS, G. (2005). Aid Heterogeneity: Looking at Aid Effectiveness from a Different Angle. *Journal of International Development*, 17, 1019-1036.

negative impact on public investment but a positive effect on public consumption.[46] Programme aid, technical assistance, and food aid, on the other hand, had a positive impact on public investment and a negative impact on public consumption.

Despite being far from conclusive, this review has evidenced that a) aid has a variety of effects beyond its immediate (although according to some studies non-existent) impact on economic growth, b) aid has in a number of cases proved its ability to boost government expenditure (in general as well as its consumption subsection) and drive down public investment, and c) detailed studies of individual countries are necessary to provide additional understanding that is unlikely to be derived from large-scale panel studies. It is the ambition of this work to be such a case study.

An Overview of the Namibian Economy

Namibia's is a relatively small economy – domestic consumption relies on the country's population of two million. Furthermore, the informal economy is relatively sizable and the rate of unemployment tends to stubbornly stay in the double digits. This means that Namibia's economy is dependent on external markets, given its rich production of raw materials.

The country is thus vulnerable to external shocks which are usually channeled in two ways. The first is at times considerable fluctuation of the prices of raw materials, particularly uranium, zinc, and diamonds. The second is Namibia's trade relationship with South Africa, which provides a decisive majority of imports and foreign direct investment.

As is obvious from *Chart 1*, which depicts the annual growth of GDP between the years 1995 and 2014 in both Namibia and the entire southern African region, Namibia has, especially in the recent years, outperformed its neighbors. In 2009 for instance, when the entire region fell into a recession caused by the global financial crisis, Namibia weathered the storm comparatively well and maintained moderate growth. Since 2010, the country resumed fast growth, which in 2014 reached 6.4% annually. Forecasts for 2015, 2016, and 2017 remain positive with 5.0%, 5.5%, and 5.9%, respectively.[47]

With 60%, the services sector remained the greatest contributor to Namibia's GDP in 2014.[48] The sector's growth slowed to 6.0% in 2014 from the previous figure of 6.5%, which was recorded in 2013.[49] According to the African Economic Outlook, this development is attributed to a slowdown in tourism.[50] The secondary sector (industry and mining) accounted in 2014 for roughly 20% of the economy and continued to grow at fast rates, mainly due to construction.[51] The agricultural sector, which likewise accounts for about 20% of the Namibian economy, demonstrated almost insignificant growth in 2014 due to weakly performing agriculture and comparatively slower growth in mining.

[46] MAVROTAS, G. and B. OUATTARA (2006). Aid Disaggregation and the Public Sector in Aid-Recipient Economies: Some Evidence from Cote d'Ivoire. *Review of Development Economics*, 10(3), 434-451.

[47] World Bank estimates, available at: http://www.worldbank.org/en/publication/global-economic-prospects/data?variable=NYGDPMKTPKDZ&region=SST

[48] data from domestic authorities, summarized in the African Economic Outlook: Namibia. *African Development Bank, OECD, UNDP*, 2015, p. 3

[49] ibid., p. 3

[50] ibid., p. 3

[51] ibid., p. 3

Table 1 details the representation of various sectors in the Namibian economy. The importance of agriculture, forestry, fishing, and hunting declined between 2009 and 2013 but clearly, fishing remains an important source of exports with 3.1% of GDP at current prices. Mining and quarrying increased its share of GDP from 11.8% in 2009 to 14.0% in 2013. Wholesale and retail trade, together with repair of vehicles, household goods, as well as restaurants and hotels, did not necessarily expand during the 2009 – 2013 period. What did claim an increased share of Namibia's GDP however, was public administration and defense, which climbed from 11.0 to 13.0% of the gross domestic product.

This brief overview of the importance of various sectors of the Namibian economy confirms the results of Humavindu and Stage, who studied the country's economy based on input-output and Social Accounting Matrix analyses. They find that mining and government services are key sectors.[52] As has been mentioned above, Namibia has some of the largest deposits of diamonds, uranium, and zinc on Earth and mining thus remains an industry capable of boosting Namibia's growth. The African Development Bank's analysis of Namibia's economy forecasts that "medium term growth outlook remains positive as external demand improves and new mines start production."[53] Clearly however, the mining industry is outward oriented and a slowdown of the global economy, which today could easily be unleashed by China's troubling transformation to an economy driven by domestic consumption, would be palpably evident in Namibia as well.

Namibia's dependence on its mining industry, it must be added, is not the only source of its exposition to external risk. The country's dependence on South Africa is just as significant. Underpinned by a monetary policy that pegs the Namibian dollar to the South African rand, Namibia does most of its business with Pretoria. In 2013, South Africa accounted for about 27% of Namibia's exports, most of which consisted of beverages, beef, live animals, and fish. The country's South African imports, however, are the true measure of its dependence on the southern neighbor. South Africa represents about 62% of Namibia's imports. Importantly, these imports range from vehicles, fuel, and pharmaceuticals to very mundane products such as food and household utensils.[54] Clearly, these statistics evidence extensive dependency on the part of Namibia.

Other important destinations for Namibia's exports are the Euro area and Botswana. Botswana, where the trade counter of the large diamond company De Beers is located, is an important destination of diamond exports. Let us lastly mention that minerals, among which diamonds are crucial, account for a total of 45% of Namibia's exports.[55] The current account balance, which had long developed in a negative fashion, finally showed signs of improvement in 2014. This was due to narrowing merchandise deficit and considerable capital inflows. The overall balance of payments moved in the third quarter of 2014 from a deficit to a surplus of 640 million Namibian dollars.[56] Foreign

[52] HUMAVINDU, Michael N and Jesper STAGE. Key Sectors of the Namibian Economy. *Journal of Economic Structures*. 2013, **2**(1), 1-. DOI: 10.1186/2193-2409-2-1. ISSN 2193-2409. Available at: http://www.journalofeconomicstructures.com/content/2/1/1

[53] African Economic Outlook: Namibia. *African Development Bank, OECD, UNDP*, 2015, p. 4

[54] ibid., p. 6

[55] ibid.

[56] ibid., p. 7

direct investment, which mainly flows into Namibia's mining industry, continued to show positive numbers in 2013 and accounted for 5.6% of GDP. This statistic put the country ahead of Mauritius, South Africa, and Botswana, Namibia's main competitors.[57]

Table 2 brings the reader's attention to Namibia's public finances. Compared to other peer countries in the region, Windhoek prides itself on comparatively high levels of revenue mobilization. Tax revenue has steadily increased as share of GDP and now regularly represents close to a third of the gross domestic product. Current expenditures of the government, together with expenses devoted to wages and salaries however, have also grown at a relatively fast pace. If we consider the fact that capital expenditure has somewhat dwindled (and continues to do so in the African Development Bank's forecast), we conclude that the government's finances are not necessarily on a healthy path. Particularly publicly owned enterprises, which manage the country's water and electricity supply as well as other key sectors, have performed quite poorly and often sought last resort in the asylum of the government's budget.

High rates of unemployment remain a lasting challenge to the Namibian economy. The officially reported figures usually fluctuate between 20 and 30%[58] of the labor force but under its broad definition, the statistic would likely climb 10 to 15% higher. Discouraged job seekers may not necessarily look for work (and thus be counted under the strict definition of unemployment) but that does not mean that they are unable or unwilling to accept almost any job. However, in the case of Namibia, the rural areas, where most of the population resides, do not provide the kind of economic opportunities that would make the strict definition of unemployment a more useful statistic. Quite to the contrary, entire sections, whether social or geographical, of the Namibian society never truly join the formal economy and resort to subsistence farming. Namibia thus remains one of the most unequal societies on the face of the Earth, a state which the Gini index of 59.7 statistically illustrates.[59] Though Namibia is an investment destination characterized by political stability and good infrastructure, the lack of (semi)skilled workers is a crucial problem. Unskilled labor remains abundant but in an economy dominated by capital-intensive industries, its contribution towards the country's growth remains limited.

Limited employment opportunities are a challenge at a time when the Namibian population is growing and young people make up a crucial component of the population. According to the 2011 census, the median age in Namibia is 21 years.[60] This means that a growing economy and expansion of employment opportunities is of vital importance for Namibia's future.

The Bilateral Relationship Between Germany and Namibia

The history of the German-Namibian economic relationship can be traced back to the Berlin Conference of 1884 when Germany secured the "right" to colonize Namibia.[61] This initial relationship was

[57] ibid.

[58] World Bank data, available at http://data.worldbank.org/indicator/SL.UEM.TOTL.ZS?page=1

[59] The World Factbook, CIA, 2010. Available at: https://www.cia.gov/library/publications/the-world-factbook/rankorder/2172rank.html

[60] Namibia Population and Housing Census 2011. *Namibia Statistics Agency*, available at: http://cms.my.na/assets/documents/p19dmn58guram30ttun89rdrp1.pdf

[61] KEULDER, C. *State, Society and Democracy: A Reader in Namibian Politics*. Windhoek: Macmillan Education, 2010. ISBN 978-999-1602-653, pp. 28 - 29

rather exploitative in nature as Germany only opted for colonialism after reasoning that its activity in South West Africa, as Namibia was then known, could yield economic benefits. German traders and settlers such as Adolf Lüderitz had long wanted the German Empire to increase its activity in South West Africa and Berlin's decision to embark on its colonial project was thus a gradual process rather than a sudden coincidence.[62]

From the outset, Namibia has been Germany's important supplier of primary commodities such as karakul pelts, diamonds, cattle, butter, fish, vanadium, copper ores, tin, wood, sheep and goat skins, cow hides, meat, cheese, lead, whale oil, ostrich feathers, and guano. This accounted to 10.7% of Germany's import volume from her 15 colonies[63] and Namibia's role as a trade partner to Germany continues until the present day. Between 2005 and 2009, the import partner share that Germany displayed with respect to Namibia grew from less than 2% to over 3.25%.[64] This figure, however, decreased to about 1.5% in 2013. This development is further illustrated by absolute numbers. Whereas between 2005 and 2009 Namibian imports from German grew from about 50 million US to dollars to well above 200 million, the figure decreased between 2010 and 2013. In 2013, Namibia imported about 114 million US dollars worth of goods. The share of Germany in the totality of Namibian exports first decreased from about 3.5% to 1% between 2005 to 2009. Between 2010 and 2016, the figure moved between 1.75 and 1%. Absolute export numbers varied between the peak of 109 million US dollars in 2006 to 49 million in 2008.[65] Naturally, these figures are likely to be influenced by the Great Recession which undermined world-wide demand for primary commodities.

According to most recent figures, the two countries' economic relationship has been characterized by continued bilateral trade, increased German foreign direct investment as well as development cooperation. In 2014, the total figure of bilateral trade amounted to 274 million euros (302 million USD); German imports from Namibia reached 155 million euros (171 million USD) and German exports to Namibia accounted for 119 million euros (131 million USD).[66] The principal imports that reached Germany were non-ferrous metals and other raw materials. Food

[62] See, for instance, GRÜNDER, Horst. *Geschichte der deutschen Kolonien*. 3., verb. und erg. Aufl. mit neuer Bibliogr. Paderborn [u.a.]: Schöningh, 1995. ISBN 9783825213329 and CONRAD, Sebastian. *German Colonialism: A Short History*. English ed. New York: Cambridge University Press, 2012. ISBN 9781107400474.

[63] HENDERSON, W. O. *Studies in German Colonial History*. 2. impr. London: Cass, 1962. ISBN 9780714616742, HENDERSON, W. *The German Colonial Empire, 1884-1919*. Portland, Or.: F. Cass, 1993. ISBN 0714634271, VOELTZ, Richard A. *German Colonialism and the South West Africa Company, 1884-1914*. Athens, Ohio: Ohio University, Center for International Studies, 1988. ISBN 0896801462, and SOLF, W. H. *Colonial Policies*: *My Political Testament.* Berlin: Reimar Hobbing Publisher, 1919 cited in AMAVILAH, Voxi H. German Aid and Trade versus Namibian GDP and Labour Productivity. *Applied Economics* [online]. 1998, vol. 30, issue 5, s. 689-695 [cit. 2015-04-12]. DOI: 10.1080/000368498325679, p. 689

[64] The World Integrated Solution database of the *World Bank*. Available at: http://wits.worldbank.org/CountryProfile/en/Country/NAM/StartYear/2010/EndYear/2014/TradeFlow/Import/Partner/DEU/Indicator/MPRT-PRTNR-SHR

[65] ibid.

[66] Namibia. *Federal Foreign Office* [online], 2016. [cit. 2016-01-01]. Available at: http://www.auswaertiges-amt.de/EN/Aussenpolitik/Laender/Laenderinfos/01-Nodes/Namibia_node.html

represented another major category of Namibian exports to Germany. Germany's main exports to Namibia were composed of machinery and food.[67] The conditions for bilateral trade are expected to improve with the 2014 conclusion of the South African Development Community-European Union Economic Partnership Agreement (EPA) which guarantees better access to the EU market to Botswana, Lesotho, Mozambique, and Namibia.

An important German investment project in Namibia is Ohorongo Cement, a subsidiary of the Schwenk group, which was opened in 2011. The project represents an investment of approximately 250 million euros (275 million USD).[68] After the United States, Germany is Namibia's greatest donor of development aid.[69]

The unique nature of German-Namibian development cooperation is illustrated by a recent energy project that combines the values of development, sustainability, and cooperation. The project, titled *Energy for Future*, was launched by the German development minister Dirk Niebel in 2011. The initiative attempts to counter a negative development that has in the past made sustainable agriculture particularly difficult – the spread of invasive bush. As mundane as this challenge may sound, it has made over 26 million hectares of land virtually unusable which has in turn led to declining number of livestock, many Namibians' primary source of subsistence. Energy for Future introduced into the area harvesting machines which are capable of harvesting the bush and thus stopping its massive invasion. Furthermore, the bush is turned into woodchips that are subsequently used as fuel in a nearby cement factory. Biomass energy generation is crucial for Namibia, for the country still cannot claim the title of an energy self-sufficient nation.[70]

Development Aid Assistance

Let us now focus on German ODA to Namibia in more detail. In order to provide a comprehensive analysis, we will first analyze German ODA to Namibia in absolute terms. *Table 3* lists the forty largest recipients of German ODA on the African continent (all tables and charts are found in the appendix). A note on the nature of the data used in this analysis is appropriate here. First, all data on development aid were retrieved from the OECD International Development Statistics, additional data such as population statistics originate in the World Bank. We analyze net development aid *disbursements* rather than development aid *commitments*.

Thus, the figures provided below reflect the actual capital received by the recipient country rather than mere political commitments. This is also crucial for our subsequent regression analysis, for we seek to quantify the actual effects that German ODA exerts on the Namibian economy. Second, Table 3 lists the mean annual figure for German ODA over the period from 1991 to 2013. This data range is not only sufficiently wide and thus capable of avoiding the danger of being skewed by a few particularly divergent data points, it is also particularly relevant in the case of

[67] ibid.

[68] ibid.

[69] *OECD aid statistics*, available at: https://public.tableau.com/views/AidAtAGlance_Recipients/Recipients?:embed=n&:showTabs=y&:display_count=no?&:showVizHome=no#1

[70] German Development Minister Dirk Niebel concludes visit to Botswana and Namibia, launches important flagship project. *Federal Ministry for Economic Cooperation and Development* [online]. 2011 [cit. 2016-03-09]. Available at: http://www.bmz.de/en/press/aktuelleMeldungen/archive/2011/august/20110829_pm_145_botsuana_namibia/index.html

Namibia. Before the country gained independence in 1990, all official ODA disbursements had to be channeled through the South African government which at that time *illegally* (according to a United Nations resolution) administered Namibia. Many donors thus refrained from development aid provision altogether or opted for supporting various NGOs. Data on aid provided through such channels before 1990 is both rare and unreliable. The period from 1991 to 2013 is thus the most reliable and recent data set available.

A brief glimpse over Table 3 will suggest that in absolute terms, Namibia does not necessarily enjoy a special position among the African recipients of German ODA. Out of the forty largest recipients of German aid, Namibia ranks seventeenth and despite the fact that the country places well above the median recipient, it lags far behind countries of the likes of Nigeria, Cameroon, the Democratic Republic of the Congo, Zambia, and Ethiopia, which represent the five largest recipients of German ODA on the black continent. However, the careful reader should not omit the fact that other former German colonies occupy the front positions. Namely, Cameroon ranks second after Nigeria and Tanzania places sixth. Rwanda and Burundi, both of which formed part of German East Africa between 1884 and 1916, also appear among the forty largest recipients.

As will become obvious in the next few pages, the ranking of countries presented above will significantly change once we take into account the recipient countries' populations. Indeed, *per capita* levels of development aid are an entirely different beast. The phenomenon that is likely to hold some explanatory power when we compare Table 3 with *Table 4* is termed *population bias*. Trumbull and Wall as well as Burnside and Dollar, for instance, have observed that per capita aid tends to be significantly higher for countries with relatively small populations.

Trumbull and Wall provide one plausible explanation to this phenomenon by suggesting that "donors prefer to spend their limited ODA budgets where they can have their greatest impact per person."[71] Berthélemy and Tichit argue that the notion that the effectiveness of aid increases with a declining population results in per capita aid distribution that may not be at all in accord with need: "some of the smallest and least poor developing countries, such as Mauritius, Botswana and Namibia receive high level of assistance per capita."[72]

Table 4 evidences that the observations of Berthélemy and Tichit hold true over the period of 1991 to 2013, which is the focus of our study. In per capita terms, Namibia claims the first place among all African recipients of German ODA. In fact, Namibia's per capita figures are more than sixfold higher than that of a median recipient country in our sample of forty countries, which receives 2.35 US dollar per capita. Namibia is closely followed by Botswana, which receives 14.5 US dollars per capita and Cabo Verde, which saw itself receiving 11.6 US dollars of German ODA per capita. It is the per capita statistic that puts Namibia's seventeenth place in absolute terms in an entirely different and arguably important perspective. In Table 3, which displays German ODA disbursements in absolute terms, Namibia is surrounded by countries such as Rwanda, Malawi, and Benin. These countries received similar mean amounts of German ODA between

[71] TRUMBULL, William N. & Howard J. WALL, "Estimating Aid-Allocation Criteria with Panel Data," *Economic Journal*, Vol. 104 (425),1994, p. 876

[72] BERTHÉLEMY, Jean-Claude & Ariane TICHIT. Aid *Allocation Decisions. A Three-dimensional Panel Analysis, WIDER Discussion Paper No. 2002/123*. Helsinki: The World Institute for Development Economics Research, 2002, p. 6

1991 and 2013. However, their populations are much larger than that of Namibia. While Namibia's population only surpassed the two-million mark recently, Rwanda, Malawi, and Benin house populations that are roughly five times as large as that of Namibia.

This explains Namibia's prime position among per capita recipients of German development aid. Importantly, Namibia's first place has been solidified over the last decade. Even though Cabo Verde ranked as first at the beginning of the twenty-first century, the country has now lost ground to Namibia and ranks third in our most recent data set.[73] Per capita figures are thus *the* statistic that illustrates Germany's extraordinary role as one of Namibia's largest and most important donors of development aid.

Chart 2 captures the development of German ODA to Namibia per capita over the period between 1991 and 2013. A mere glance over the graph reveals that the already high mean figure of per capita ODA was, as the mathematical logic of the mean suggests, repeatedly surpassed over the last two and a half decades. In fact, per capita German ODA peaks twice, each time rising above the unprecedented level of thirty US dollars. Crucially, not a single time did German ODA to Namibia sink below five US dollars per capita, a level that most recipients of German development aid do not reach even in the form of mean ODA. The 1990s witnessed a clear positive trend in German development aid disbursements to Namibia. For reasons outlined above, development aid channels through which donors could provide capital prior to Namibia's independence in 1990 were limited. It is thus only after the country gained independence that aid disbursements rose significantly. The initial surge of German ODA disbursements is palpable in Chart 2.

Even though German ODA poured into Namibia at a volume of about ten US dollars per capita at the beginning of the 1990s, it reached the unprecedented level of above thirty US dollars per capita by the midpoint of the decade. Subsequently, the figures of German per capita aid decreased steadily (still maintained comparatively high levels however) until about 2006, when the statistic picked up again and reached the second highest point of 30.7 US dollars per capita in 2011.

To argue that money talks in political relationships when it comes to development aid disbursements may not be a novel idea but the case of Namibia provides relatively clear evidence of that observation. Out of the three main peaks of per capita aid disbursements that we observe in Chart 2, two coincide with high-profile visits of German politicians in Namibia. In 1995, when German ODA per capita to Namibia reached an all-time high of 31.1 US dollars, German chancellor Helmut Kohl paid the former German colony a visit. Another peak in per capita ODA was preceded by German president Roman Herzog's visit in 1998. Clearly, German politicians tell the truth when they announce that "the worldwide highest per capita aid from Germany to Namibia is no coincidence,"[74] as president Roman Herzog did in 1998.

A similarly analytical approach is required to elucidate the degree to which Namibia is likely to perceive German aid as vital. *Table 5*, which depicts German ODA as portion of total ODA received over the

[73] SCHÜRING, Esther. *History Obliges: The Real Motivations Behind Aid Flows in the Case of Namibia*. 2004, p. 23

[74] Deutschland. Bundespräsident Herzog in Namibia und Südafrika, *Archiv der Gegenwart: die weltweite Dokumentation für Politik & Wirtschaft* 42726, March 3, 1998 cited in SCHÜRING, Esther. *History Obliges: The Real Motivations Behind Aid Flows in the Case of Namibia*. 2004, p. 21

period between 1991 and 2013 will serve this purpose. In other words, it shows how much of its annual ODA, averaged over the period between 1991 and 2013, a country would lose if Germany were to cease its provision thereof. In the case of Namibia, German ODA represents 16.15 per cent of all the aid the southern African nation receives. In this sense, Namibia is only surpassed by Cameroon, which displays even higher dependence on German development assistance. However, Namibia's figure is particularly high given the fact that Benin, for instance, a fourth country in the discussed list, receives roughly nine per cent of its development aid from Germany. Indeed, a much more common statistic among the twenty nations that display the highest dependency on German ODA revolves around five per cent.

Compared to other countries in the region, Namibia displays a greater discrepancy between the importance of German aid and that of other donors. For instance, Schüring analyzes aid disbursements data for the period between 2000 and 2001 for the four African countries (Botswana, Cameroon, Libya, Namibia) in whose case Germany was the second largest donor in absolute terms (Germany was not the largest donor for any African country in the 2000 – 2001 period). She finds that in the case of Namibia, the financial gap between Germany and the other donors was comparatively larger.[75] In other words, the loss of Germany as an ODA donor would hurt Namibia more than if the country lost her other bilateral donors.[76] The importance and potential of development aid have naturally a lot to do with the structure of the Namibian economy, its peculiarities, strengths, and weaknesses. Many of such characteristics have in turn a lot to do with the colonial history whose presence the German government invokes as a source of the "special responsibility" towards Namibia.

THEORETICAL FRAMEWORK AND MODEL SPECIFICATION

We will test three different data sets. The first one covers the period between 1991 and 2013 and contains data on world and German ODA (hereafter termed the 1991 data set). The second data set runs from 2000 to 2013 and contains world and German ODA as well as Namibian imports of world and German capital goods (2000 data set). The last data set runs from 2000 to 2011 and includes world and German ODA as well as Namibian governmental capital formation outlays. See the section *Data* for more information.

The Cobb-Douglas Production Function Model Adjusted for Foreign Aid

The model of Namibia's gross domestic product is derived from pure production function theory which assumes that all production is some combination of labor and capital. The usual assumptions are therefore implied: if labor or capital becomes entirely unavailable, production will come to a halt; the marginal productivity of labor is proportional to average labor productivity; the marginal productivity of capital is proportional to the average productivity of capital. We will assume the Chenery-Strout understanding of foreign development assistance as a low-cost source of capital. Even though this understanding has been problematized in recent literature, the likes of Easterly base their criticism mainly on the claim that economic growth is related to physical

[75] SCHÜRING, Esther. *History Obliges: The Real Motivations Behind Aid Flows in the Case of Namibia*. 2004, p. 25

[76] Except, of course, the first donor. At the time of Schüring's analysis however, the greatest donor in absolute terms was the European Union, of whose aid Germany is an important source.

capital investment to a lesser extent than is assumed by the Chenery-Strout logic. However, it must be noted that in the case of our study, this criticism is likely to miss its target. First, it has been thoroughly evidenced throughout the overview of the Namibian economy provided above that Namibia's economic well-being *is* likely to be determined by physical capital accretion. Extraction of mineral resources, the backbone of the Namibian economy, is obviously dependent on sufficient capital necessary for the smooth operation of Namibia's mines. Second, Namibia is characterized by relatively high levels of unemployment as well as a high share of unskilled workers within the labor force. Thus, the limiting factor of Namibia's economic growth, at least for the foreseeable future, seems to be rooted in capital, not labor, accretion.

Yet another line of criticism of the Chenery-Strout logic bases its validity on the claim that a certain, and perhaps large, portion of foreign aid is consumed, not invested. We partially curtail the viability of this critique by testing for various kinds of aid, thus examining aid's fungibility. Furthermore, the second part of our analysis estimates the effect of aid on government expenditure on capital formation, likely one of the prime channels through which aid is potentially consumed. The consumed portion of aid is thus expected to be detected in one form (tests for disaggregated aid) or another (government capital formation expenditure).

Assuming pure production function theory, let Namibia's GDP for the period 1991 – 2013 (alternatively 2000 – 2013) be

$$Y = F(q, \lambda) \qquad (1)$$

where Y is Namibia's real GDP in US dollars (US $), F is the transformation rule associating Y and q, q is Namibia's vector of explanatory inputs and λ is a Hicks neutral rate of technical change. Assuming a multiplicative aid-augmented Cobb-Douglas production function,[77] we arrive at the following equation:

$$Y = \theta L^{\alpha} K^{\beta} A^{\gamma} \exp(\lambda t + \mu) \qquad (2)$$

where L is labor, K is capital, A is official development aid disbursements, t is time, μ is the normally distributed error term, and α, β, and γ are the estimated coefficients. Naturally, it is assumed that L, K, and A are independent. Our preliminary analysis of the 1991 data set tests the effects of disaggregated official development assistance in the following form:

$$Y = \theta L^{\alpha} K^{\beta} A_{WG}^{\gamma} A_{WT}^{\delta} A_{WL}^{\varepsilon} A_{GG}^{\zeta} A_{GT}^{\eta} A_{GL}^{\iota} \exp(\lambda t + \mu) \qquad (3)$$

where A_{WG} are ODA grants received from all of Namibia's donors but Germany (world), A_{WT} is world technical cooperation, A_{WL} are world ODA total net loans, A_{GG} are German-originating ODA grants, A_{GT} is German-originating technical cooperation, A_{GL} are German-originating ODA total net loans, t is time, μ is the normally distributed error term, and α, β, γ, δ, ε, ζ, η, and ι are the estimated coefficients.

[77] For other studies that include aid in the production function, see

MBAKU, John M. Foreign aid and economic growth in Cameroon. *Applied Economics*. 1993, **25**(10), 1309-1314. DOI: 10.1080/00036849300000098. ISSN 0003-6846. Available at: http://www.tandfonline.com/doi/abs/10.1080/00036849300000098

ISLAM, Anisul. Foreign Aid and Economic Growth: An Econometric Study of Bangladesh. *Applied Economics*. 1992,**24**(5), 541-544. DOI: 10.1080/00036849200000067. ISSN 0003-6846. Available at: http://www.tandfonline.com/doi/abs/10.1080/00036849200000067

The 2000 dataset includes imports of capital goods and the preliminary analysis was based on the following model:

$$Y = \theta L^{\alpha} K_N^{\beta} K_W^{\gamma} K_G^{\delta} A_{WG}^{\varepsilon} A_{WT}^{\zeta} A_{WL}^{\eta} A_{GG}^{\iota} A_{GT}^{\kappa} A_{GL}^{\nu} \exp(\lambda t + \mu) \quad (4)$$

where K_N represents accumulated Namibian capital, K_W stands for Namibian imports of world capital goods, and K_G represents Namibian imports of German capital goods. It is assumed the capital goods will perform the role of capital in the Cobb-Douglas production function, hence the letter K. In order to avoid double counting, K_N, accumulated Namibian capital, is defined as total capital minus Namibian imports of German and world capital goods: $K_N = K - K_G - K_W$.

We will also run the above regressions using lagged ODA and lagged capital goods in order to test for the independent variables' delayed effects. The variables will be lagged by one year.

Government Expenditure on Capital Formation Model

A large portion of the aid-expenditure debate has employed large samples of cross-sectional data. Despite the fact that these studies are in many cases both theoretically and methodologically sound, their nature limits the extent to which they can consider country-specific situations. The literature review provided above suggests that case studies of individual countries are necessary to supplement studies relying on cross-sectional as well as panel data and thus yield additional understanding of the relationship between foreign aid and government expenditure. Largely because we are above all interested in determining the relationship between public capital formation expenditure and foreign aid, we will employ relatively simple methodology that follows the studies of Pack & Pack and Cashel-Cordo & Craig.[78] These studies do not rely on any specific theoretical framework but for the purpose of our limited interest in one dependent variable, this is not perceived as an obstacle. Specifically, we express government expenditure on capital formation in the following manner:

$$GCF = f(A) \quad (5)$$

where GCF is annual government expenditure directed to capital formation and A stands for official development assistance disbursements. This general relationship assumes in our case the following form:

$$GCF = \theta + \alpha A + \mu \quad (6)$$

where μ is the normally distributed error term. The model tested in preliminary analysis took the following form:

$$GCF = \theta + \alpha A_{WG} + \beta A_{WT} + \gamma A_{WL} + \delta A_{GG} + \varepsilon A_{GT} + \zeta A_{GL} + \mu \quad (7)$$

Similarly to the Cobb-Douglas equations that were explained in the previous section, we will broaden our analysis by using aid data lagged by one year in order to test for delayed effects.

[78] PACK, H. and J.R. PACK (1990), 'Is Foreign Aid Fungible? The Case of Indonesia', *Economic Journal*, 100, 188-194.

PACK, H. and J.R. PACK (1993), 'Foreign Aid and the Question of Fungibility', *Review of Economics and Statistics*, 75, 258-265.

CASHEL-CORDO, P. and S. CRAIG (1990), 'The Public Sector Impact of International Resource Transfers', *Journal of Development Economics*, 32, 17-42.

Data

Our study focuses on the period between 1991 and 2013. The exceptions are equations measuring the effects of capital goods on Namibian GDP and the capital formation equations. The reason for a smaller data set is rather practical – reliable data does not stretch far enough. Whenever capital goods enter our estimations, they refer to a shorter data set which begins in 2000 and ends in 2013. Capital formation data cover the period between 2000 and 2011. Data pertaining to official developlment assistance disbursements were retrieved from the *OECD International Development Statistics*. Data of Namibia's imports of capital goods originate in the *World Integrated Trade Solution* database of the World Bank. Data of Namibia's gross domestic product were retrieved from the *World Economic Outlook Database* of the International Monetary Fund. Data of Namibia's capital inputs come from the Federal Reserve Bank of St. Louis. One additional note is appropriate here. Because the available data end in 2011, two missing observations (for the years 2012 and 2013) had to be calculated using Namibia's figures of annual GDP and rate of capital formation as share of GDP. In other words, if we know the total size of Namibia's capital and the rate at which new capital is added anually, we can calculate the annual increments and arrive at total capital figures. The magnitude of Namibia's labor inputs was calculated using the size of Namibia's labor force and rate of employment. Both of these statistics were retrieved from the *World Development Indicators* of the World Bank.

Another note is needed here. Even though most of the data provided by such institutions as the International Monetary Fund and the World Bank is generally reliable, unemployment statistics are likely to be somewhat inaccurate. First, the aforementioned international institutions rely almost entirely on domestic institutions for their collection. Second, the difference between data collected under the strict and loose definition of unemployment can vary significantly. This means, given the size of Namibia's informal economy, that the unemployment statistics have to be taken with a grain of salt. Gaomab suggests, for instance, that the 2004 statistics of Namibia's rate of unemployment should be viewed with increased caution because the Namibia Household Income and Expenditure Survey of 2004 found that the share of households living in extreme poverty declined from 8.7 to 3.9 per cent between 1994 and 2004. These findings seem to contradict the Labour Force Survey of 2004 since it is usually assumed that an increasing rate of unemployment is positively related to rates of poverty.[79] As has been indicated above, labor, unlike capital, is not likely to be a limiting factor of Namibia's economic growth, yet increased caution when it comes to interpreting our data is entirely appropriate. When it comes to statistics of government expenditure on capital formation, the *National Accounts* produced by the Namibia Statistics Agency served as our source. All data points were converted into US dollars using the annual average exchange rate.

Estimations and Tests

It is entirely within the realm of possibility that variables Y, K, and A are simultanous and endogenous. In our study, they are assumed exogenous, so that use can

[79] GAOMAB II, M. (2007). To What Extent do Economic Policies and Structural Heterogeneities Inhibit the Employment Absorptive Capacity of the Namibian Economy? *Paper Presented at the NUNW National Symposium on Productivity and Employment*, Windhoek cited in EITA, Joel H. and Johannes M. ASHIPALA. Determinants of Unemployment in Namibia. *International Journal of Business and Management*. 2010, **5**(10), 92-104. ISSN 1833-3850.

be made of the single equation OLS estimation method with the classical linear regression assumptions about the random error term (μ). Equations 3 and 4 are estimated as log-log linear models, i. e.

$$lnY = \theta + \alpha lnL + \beta lnK + \gamma lnA_{WG} + \delta lnA_{WT} + \varepsilon lnA_{WL} + \zeta \ln A_{GG} + \eta \ln A_{GT} + \iota \ln A_{GL} + \lambda t + \mu \quad (8)$$

In the case of capital goods, the log-log linear model assumes the following form:

$$lnY = \theta + \alpha lnL + \beta lnK_N + \gamma lnK_G + \delta lnK_W + \varepsilon lnA_{WG} + \zeta lnA_{WT} + \eta lnA_{WL} + \iota \ln A_{GG} + \kappa \ln A_{GT} + \nu \ln A_{GL} + + \lambda t + \mu \quad (9)$$

The government capital formation expenditure determination linear model is estimated as equation (7), which has already been introduced above.

These regression models imply the following hypothesis tests:

The importance of German and world aid in the Y equation (8): Either H_{01}: the appropriate coefficents (γ, δ, ε, ζ, η, and ι) will be 0 or H_{A2}: the appropriate coefficents will have a non-zero value.

The importance of German and world capital goods in the Y equation (9): Either H_{01}: the appropriate coefficents (γ, δ) will be 0 or H_{A2}: the appropriate coefficents will have a non-zero value.

The importance of German and world aid in the public capital expenditure equation (7): Either H_{01}: the appropriate coefficents (α, β, γ, δ, ε, ζ) will be 0 or H_{A2}: the appropriate coefficents will have a non-zero value.

It is unnecessary to write out all of the specific hypotheses, for all are derived analogically. Let us lastly reiterate that we will estimate equations 7, 8, and 9.

RESULTS AND DISCUSSION

Preliminary parameter tests have found the rate of technical change (λ) to be highly correlated with capital and often insignificant and the variable was therefore dropped from the final estimations. Similarly, a number of independent variables (these will be soon discussed) was dropped from the estimations because they consistently exhibited t-values smaller than unity. The final results are presented in *Tables 6, 7, 8, 9, 10,* and *11*, all of which are found in the appendix. In accordance with the equations discussed above, table 6 presents the results for equation 8. Table 7 features the same equation, this time estimated using lagged foreign aid. Table 8 features equation 9, which incorporates both foreign aid and capital goods. Table 9 presents foreign aid and capital goods as lagged variables. The lagged variables were lagged by one year as longer delays in their effect on Namibia's GDP are neither expected, nor theoretically plausible.

Most of the results for the Cobb-Douglas production functions have reasonable goodness of fit, as their R^2 are relatively high (0.94 and above). Perhaps the most noticable result is the fact that domestic capital possesses a decisive explanatory power when it comes to determining Namibia's GDP. Especially in the equations that incorporated the 1991 aid data, domestic capital exerted strong positive influence, with coefficients above 1. What this means is that if capital available for the production process increases by one per cent, the corresponding change in Namibia's GDP, all other things constant, will be larger than one per cent. Furthermore, the mentioned coefficients are highly significant, in most cases at the 1 per cent level.

Even though we expected the effect of labor inputs to be somewhat lower than that of capital, our results surpass our expectations. In fact, labor appears to be statistically insignificant and its coefficients are either low or negative in equations that use the 1991 dataset. A number of explanations can be offered. First, Namibia is characterized by abundant labor force while at the same time, its economy is centered around capital-intensive industries. This means that accretion of physical capital, not labor inputs, will continue to be crucial for Namibia's economic performance. Naturally, a growing national economy does not necessarily have to, and has not, benefited the entire population equally as Namibia's high Gini coefficient indicates. In fact, Namibia's growing population tames the kinds of optimistic interpretations that compare the country's rate of growth to countries with lower rates of population growth. In Namibia's case, economic growth naturally needs to be higher in order to surpass the rate of population growth and still enlarge *per capita* economic output. As long as population growth remains considerable and unemployment relatively high, the economy is not likely to experience a shortage of unskilled labor. Second, the very fact that a large portion of the country's labor force is unskilled means that those sectors of the Namibian economy that seek skilled workers will not be able to find them. This is arguably one of the reasons why foreign investment opportunities in Namibia have not been exhausted. Though the absolute numbers of employed Namibian workers have increased, we may suspect that this growth was largely driven by unskilled labor. Even though labor reports of statistics agencies speak of ever increasing numbers, the situation in the labor market has changed relatively little for employers seeking skilled or semi-skilled workers. Lastly, statistics of labor inputs have to be viewed with scepticism. As has been noted under the section *Data* above, it has been suggested that our numbers may not entirely correspond to reality.

When emphasizing that capital plays a crucial role in Namibia's production function, we must not forget to add that we are referring to both *domestic* and *imported* capital. We reject our null hypothesis concerning the importance of world capital goods in favor of the alternative. In fact, world capital goods have a positive effect on the GDP of Namibia that is significant at the one per cent level. Furthermore, the coefficient on the natural log of world capital goods is almost as high as that on the natural log of world development aid grants, which means that imports of capital goods could potentially be seen as an alternative to certain kinds of ODA. This suggestion only gains currency when we once again reiterate that domestic capital is of crucial importance and that imports of capital goods will, ideally and ultimately, contribute to domestic capital accummulation.

However, we fail to reject our null hypothesis concerning the importance of German capital goods because equations that incorporated imports of German-originating capital goods as a variable indicate that these imports do not have a statistically significant effect on the economy. Lack of direct statistical evidence notwithstanding, we dare to suggest that considerable imports of capital goods might (especially after these become part of domestic capital) exert a positive influence on the Namibian economy.

Finally, let us focus on the role that official development assistance plays in determining the gross domestic product of Namibia. The effect German foreign aid appears to be relatively negligible. As a result of preliminary estimations, which made it clear that coefficients on German

aid are either negative or statistically insignificant and almost invariably with t-values less than unity, German ODA was dropped from the final estimation of equation 8. We fail to reject the null hypothesis in favor of the alternative one, which contends that German aid has a non-zero effect on Namibia's GDP. The only exception is German technical aid which featured in the final estimation of equation 9. German technical aid was significant with a positive coefficient at the ten per cent level in this estimation. This, however, is too little to alter the general conclusion that the impact of German ODA is insignificant. In this respect, this study differs with Amavilah who concluded, working with data that covered the period from 1985 to 1995, that German aid does have a positive and statistically significant effect on Namibian GDP.[80]

World aid, on the other hand, exhibited relatively robust influence over Namibia's GDP. In the estimation of equation 8, world ODA grants were significant at the five per cent level with an arithmetically correct coefficient. When lagged by one year, world ODA grants exhibited an even higher statistical significance at the one per cent level. This was also true for world technical aid and our hypotheses for these kinds of world aid have been rejected in favor of the alternatives. The coefficient on world grants in the non-lagged equation was 0.705 which means that if grants are increased by one per cent, everything else constant, Namibia's GDP will grow by 0.71 per cent.

A considerably more robust influence of foreing aid is detected in the public investment equation (7), which had exceptional goodness of fit (0.99). Both German and world aid seem to be of higher significance for public expenditure devoted to capital formation than for the gross domestic product. The null hypotheses for all three kinds of world aid and German ODA loans have been rejected in favor of the alternatives. When the independent variables are lagged by one year, we also reject the null hypotheses for German grants and German technical aid, although only German technical aid has the expected arithmetical coefficent. Several of the independent variables are significant at the one and five per cent levels. Importantly, our results suggest that, all else constant, a one-dollar increase in aid would increase government expenditure on capital formation by more than one dollar. This means that ODA can not only serve as a direct source of capital, but that it can also motivate the recipient government to match the donors and further increase investment.

We can establish that the direct as well as indirect effects of foreign aid on governmental capital formation outlays are considerable. The results for disaggregated aid suggest that grants are of particular importance to public investment. Indeed, the portion of world aid that is represented by grants was highly significant while the other types of aid exhibited negative coefficients of smaller significance. This could perhaps be explained by the fact that grants are typically somewhat more fungible than, say, technical assistance. While technical assitance is only devoted to specific projects, grants offer the recipient governments more flexibility when it comes to determinig which investment project are to be bolstered by aid. Of the German independent variables, ODA loans were significant at the one per cent level.

The results for lagged aid, presented in *Table 11* in the appendix, corroborate the notion that grants are of particular importance for capital formation

[80] AMAVILAH, Voxi H. German Aid and Trade versus Namibian GDP and Labour Productivity. *Applied Economics*. 1998, vol. 30, issue 5, s. 689-695. DOI: 10.1080/000368498325679.

expenditure. In fact, the coefficient on lagged world grants is higher than that on non-lagged world grants which could mean that past grants create positive expectations on the part of the government which is more willing to increase next year's investment budget. This notion would make some sense when we consider the budgetary process which commences long before the fiscal year starts and if aid flows are to influence the recipient countries' governments' fiscal behavior it is likely to do so based on future expectations rather than current disbursements. Of the German lagged independent variables, technical aid was significant at the ten per cent level.

CONCLUSION

This study examined the impact of German sources of capital on the Namibian economy. We have tested the effects of German development assistance as well as Namibian imports of German capital goods on Namibia's GDP. Subsequently, we have compared German development assistance and capital goods to resources flowing from all of Namibia's donors and trading partners to determine whether German sources of capital play a particular role. Our work suggests that German development aid has almost no statistically significant impact on the Namibian gross domestic product. Similarly, Namibian imports of German capital goods seemed to make little difference in our model.

However, ODA disbursements from other donors than Germany did appear to play a statistically significant role. World grants and world technical aid had a positive impact on the Namibian economy, measured through its GDP. Futhermore, Namibian imports of world capital goods exhibited a strong positive impact on the Namibian economy. Therefore, we reason that boosting Namibia's well-being through imports of capital goods may be just as, if not more, effective as ODA provision.

We have further established that domestic capital is of critical importance for Namibia's economic well-being. Augmenting domestic capital through foreign direct investment, for instance, seems to be yet another possible alternative to official development assistance. Our tests also suggest that the Namibian labor force is a comparatively less important factor in the country's production function. In order to change this, transform the Namibian economy itself, and ensure long-term growth, policy makers have to provide Namibia's workers with adequate training and education opportunities.

However, we have found evidence that foreign aid does have a statistically significant effect on public expenditures directed to capital formation. This is particularly true for world grants and technical aid as well as German technical aid and ODA loans. In the case of German aid, our results thus are, as it were, somewhat paradoxical. Even though we have concluded that boosting domestic capital will have a positive effect on the country's gross domestic product, German develpment aid, which seems to motivate the government to invest in capital formation, is of little significance to the country's GDP. The most likely explanation is that the link between aid disbursements, government capital formation outlays, *actual* capital formation, and the gross domestic product could be broken, or at least imperfect. We have established that foreign aid likely augments public investment and that capital improvements will exert a positive effect on Namibia's GDP. The locus where the aforementioned link could be broken is thus between government capital formation outlays and actual capital formation. Let us remind the reader that our regressions work with the *budgeted* capital formation figures. Whether the budgeted figures correspond to actual outlays is a

question that could be taken up by future research. What is important, the aforementioned link does not seem to be broken in the case of world aid. In this light, it is easy to see, aside from political motivation, why German aid provision continues despite weak statistical evidence that it influences the Namibian economy. First, if world aid can make a difference,it is likely that German aid, too, will matter. Second, German aid has an effect on the government's spending behavior which is a considerable outcome in itself.

Future research might further consider some of the results obtained in this study and subject them to a rigorous analysis using more comprehensive methods. For instance, some of the independent variables in our study likely suffer from collinearity and a diverse methodological treatment of our topic might uncover the extent to which this biases the results. Furthermore, future studies could consider some of the relationships that have been merely suggested in this work. For instance, the relative importance of imports of capital goods for the Namibian gross domestic product would benefit from detailed investigation. Lastly, Namibia's case should be compared to other contries in the region in order to determine whether the former German colony is a unique case or an instance of a more durable trend.

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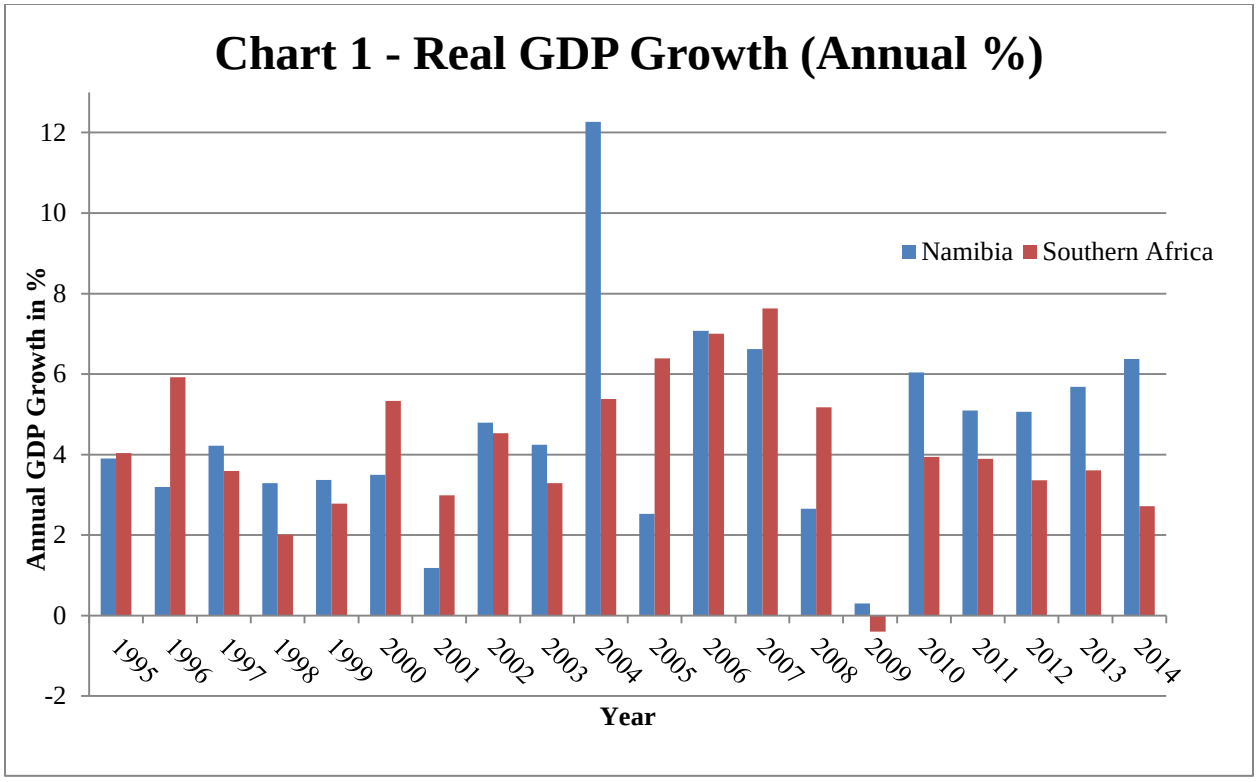
Vladimir Chlouba
Connecticut College

Appendix



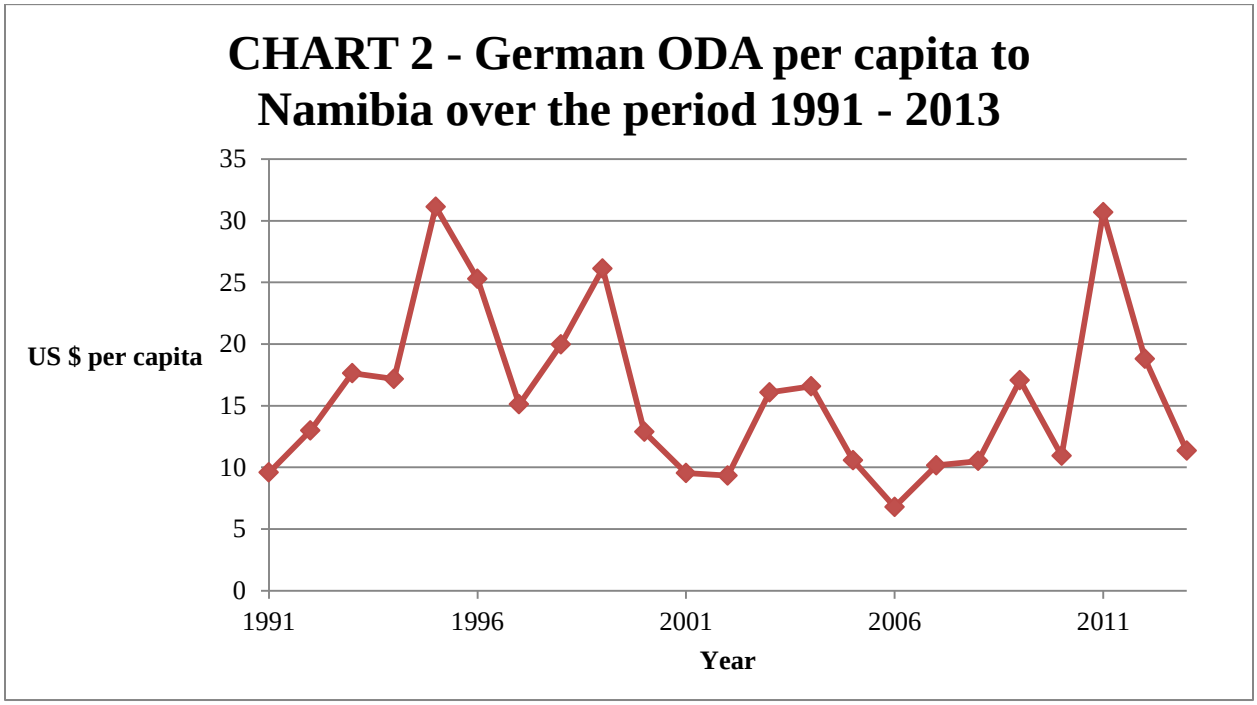


TABLE 1 - GDP by Sector (% at current prices)		
	2009	2013
Agriculture, forestry, fishing & hunting	9.0	6.1
Fishing only	4.2	3.1
Mining & quarrying	11.8	14.2
Manufacturing	14.1	13.2
Electricity, gas & water	2.2	2.0
Construction	3.5	4.1
Whosale & retail trade; repair of vehicles, household goods; restaurants, hotels	13.9	13.9
Hotels and restaurants only	1.8	1.8
Transport, storage, and communication	5.6	4.8
Finance, real estate, and business services	16.6	15.8
Public administration and defence	11.0	13.0
Other services	12.3	13.0

TABLE 2 - Public Finances (% of GDP at current prices)							
	2005/2006	2010/2011	2011/2012	2012/2013	2013/2014[e]	2014/2015[p]	2015/2016[p]
Tax revenue	24.9	25.7	31.4	32.1	35.4	33.5	31.8
Total expenditure and net lending	27.4	34.8	34.4	35.7	32.9	30.4	30.3
Current expenditure	24.0	29.2	28.9	32.1	30.5	27.8	27.8
Wages and salaries	12.2	12.9	10.8	14.5	11.2	11.4	10.9
Capital expenditure	3.0	5.0	4.2	3.0	2.4	2.6	2.5

TABLE 3 - mean ODA given by Germany in thousands of US $ over the period 1991 - 2013					
1	*Nigeria*	146,729	21	*Liberia*	26,987
2	*Cameroon*	122,836	22	*Botswana*	25,967
3	*DRC*	91,583	23	*Senegal*	25,067
4	*Zambia*	79,876	24	*Niger*	23,233
5	*Ethiopia*	77,219	25	*Chad*	20,770
6	*Tanzania*	71,915	26	*Madagascar*	17,567
7	*Mozambique*	71,287	27	*Burundi*	17,063
8	*Kenya*	62,844	28	*Guinea*	16,999
9	*Ghana*	53,192	29	*Togo*	14,952
10	*South Africa*	47,357	30	*Mauritania*	13,701
11	*Mali*	40,373	31	*Congo*	13,527
12	*Uganda*	40,066	32	*Sierra Leone*	11,888
13	*Burkina Faso*	37,592	33	*Angola*	11,819
14	*Côte d'Ivoire*	34,395	34	*Somalia*	9,963
15	*Benin*	33,770	35	*Lesotho*	7,436
16	*Malawi*	31,757	36	*Central Af. Rep.*	6,883
17	*Namibia*	30,370	37	*Eritrea*	5,494
18	*Rwanda*	29,836	38	*Cabo Verde*	5,145
19	*Zimbabwe*	29,215	39	*South Sudan*	3,753
20	*Sudan*	28,718	40	*Gambia*	2,589

TABLE 4 - German ODA per capita in US $ over the period 1991 - 2013					
1	*Namibia*	15.8	21	*Zimbabwe*	2.3
2	*Botswana*	14.5	22	*Burundi*	2.3
3	*Cabo Verde*	11.6	23	*Chad*	2.2
4	*Liberia*	8.9	24	*Côte d'Ivoire*	2.0
5	*Cameroon*	7.2	25	*Seychelles*	2.0
6	*Zambia*	7.0	26	*Tanzania*	2.0
7	*Sao Tome and Pr.*	6.8	27	*Gambia*	1.9
8	*Mauritania*	4.7	28	*Kenya*	1.9
9	*Benin*	4.5	29	*Niger*	1.9
10	*Congo*	4.1	30	*Guinea*	1.8
11	*Lesotho*	4.0	31	*Central Af. Rep.*	1.8
12	*Mozambique*	3.6	32	*DRC*	1.7
13	*Rwanda*	3.6	33	*Djibouti*	1.6
14	*Mali*	3.3	34	*Uganda*	1.5
15	*Burkina Faso*	3.0	35	*Eritrea*	1.4
16	*Togo*	2.9	36	*Somalia*	1.3
17	*Ghana*	2.6	37	*Nigeria*	1.1
18	*Malawi*	2.6	38	*Ethiopia*	1.1
19	*Sierra Leone*	2.5	39	*South Africa*	1.1
20	*Senegal*	2.4	40	*Madagascar*	1.0

TABLE 5 - German ODA as % of total ODA received by top 20 recipients of German ODA over the period 1991 - 2013					
1	*Cameroon*	18.04	11	*Burkina Faso*	5.81
2	*Namibia*	16.15	12	*Ghana*	5.28
3	*Nigeria*	10.56	13	*Malawi*	5.09
4	*Benin*	8.83	14	*Rwanda*	5.00
5	*Zambia*	8.40	15	*Mozambique*	4.95
6	*South Africa*	7.38	16	*Tanzania*	4.22
7	*Zimbabwe*	6.35	17	*Ethiopia*	4.20
8	*Mali*	6.04	18	*Côte d'Ivoire*	4.05
9	*DRC*	6.04	19	*Uganda*	3.62
10	*Kenya*	5.85	20	*Sudan*	2.85

TABLE 6 - Aid

Parameter	Equation 8
constant	-15.769 (-3.51)***
ln_capital	1.263 (5.25)***
ln_world_grants	0.705 (2.84)**
ln_world_technical	0.259 (2.09)*
ln_world_loans	0.015 (0.67)
ln_german_grants	-0.296 (-0.92)
ln_german_technical	0.174 (0.44)
R^2	0.96
Adj. R^2	0.94
observations	21

T-values in parentheses; * ten per cent, ** five per cent, *** one per cent significance.

TABLE 7 - Lagged Aid

Parameter	Equation 8
constant	-16.774 (-5.77)***
ln_capital	1.411 (10.92)***
ln_world_grants_lag	0.507 (2.97)***
ln_world_technical_lag	0.265 (2.49)**
ln_german_grants_lag	-0.434 (-1.45)
ln_german_technical_lag	0.412 (1.10)
R^2	0.95
Adj. R^2	0.94
observations	22

T-values in parentheses; * ten per cent, ** five per cent, *** one per cent significance.

TABLE 8 - Aid and Capital Goods	
Parameter	Equation 9
constant	7.644 (-1.17)
ln_capital	-0.976 (-1.02)
ln_labor	2.027 (2.24)*
ln_german_grants	-1.529 (-2.20)*
ln_german_technical	1.978 (2.11)*
ln_world_goods	0.676 (3.53)***
R^2	0.96
Adj. R^2	0.93
observations	14

T-values in parentheses; * ten per cent, ** five per cent, *** one per cent significance.

TABLE 9 - Lagged Indp. Variables	
Parameter	Equation 9
constant	-18.238 (-1.45)
ln_capital	2.216 (1.17)
ln_labor	-1.388 (-0.83)
ln_wworld_grants_lag	0.461 (0.54)
ln_world_technical_lag	0.613 (1.80)
ln_world_loans_lag	0.043 (0.74)
ln_german_grants_lag	-0.476 (-0.41)
ln_german_technical_lag	0.735 (0.57)
ln_german_loans_lag	0.003 (0.08)
R^2	0.95
Adj. R^2	0.85
observations	13

T-values in parentheses; * ten per cent, ** five per cent, *** one per cent significance.

TABLE 10 - Capital Formation

Parameter	Equation 7
constant	20262.82 (0.43)
world_grants	2.941 (11.92)***
world_technical	-1.791 (-3.05)**
world_loans	-1.723(-3.08)**
german_grants	-10.231 (-1.62)
german_technical	7.053 (1.03)
german_loans	4.085 (6.25)***
R^2	0.99
Adj. R^2	0.98
observations	12

T-values in parentheses; * ten per cent, ** five per cent, *** one per cent significance.

TABLE 11 - Lagged Aid

Parameter	Equation 7
constant	-289.505.5 (-3.10)**
world_grants_lag	3.625 (7.98)***
world_technical_lag	2.756 (2.39)*
german_grants_lag	-24.233 (-2.53)**
german_technical_lag	29.248 (2.32)*
R^2	0.95
Adj. R^2	0.92
observations	11

T-values in parentheses; * ten per cent, ** five per cent, *** one per cent significance.